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Evaluation of Waiting Time and Factors Influencing Healthcare Quality on Patient Satisfaction: A Case Study Brookfield's Outpatient Department Freetown

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Abstract

Patient satisfaction which is the fulfilment or fulfilling of a person's expectations from a service is one of the most important indicators of a healthcare quality. This study evaluates the impact of waiting time and other major factors affecting healthcare quality on patient satisfaction at the outpatient department of Brookfield's Health Centre, Freetown, Sierre Leone. A structured questionnaire was used to collect data from 150 patients, and statistical analyses were conducted to determine relationships between waiting time, accessibility, reliability, communication, and patient satisfaction. Findings reveal that long waiting times are negatively associated with patient satisfaction, highlighting the need for efficient scheduling and patient flow management. Additionally, accessibility was found to significantly influence patient satisfaction with care. The study reveals that reliability, measured by the consistency of service delivery and effective communication, particularly the provision of clear health information, are major determinants of patient satisfaction. Regression analysis confirms that all four considered factors are significantly associated with patient satisfaction ($p < 0.05$). These results emphasize the need for healthcare administrators to implement strategic interventions such as optimized appointment systems, enhanced communication training for staff, and improved service reliability. Addressing these issues can enhance patient trust and satisfaction which will result to better healthcare experiences.

Keywords: *Healthcare Quality, Outpatient Department, Patient Experience, Patient Satisfaction, Service Efficiency, Waiting Time.*

Introduction

In today's healthcare landscape, patient satisfaction has become a paramount indicator of service quality, particularly in outpatient settings where access to timely care is essential [1]. One of the most significant challenges faced by outpatient departments in public healthcare is excessive waiting time, which has been linked to decreased patient satisfaction and negative perceptions of healthcare quality [2]. Long waiting time not only frustrate patients but can also lead to adverse health outcomes, as delays in receiving care can exacerbate medical conditions [3]. Therefore, addressing this issue is essential for improving the patient experience and ensuring effective healthcare delivery [4].

People who do not have access to quality care frequently have a poorer quality of life and a lower lifespan than those who have access to a stable, affordable and accessible healthcare system [11]. Countries with effective and efficient healthcare systems have better health outcomes than countries with inefficient and ineffective healthcare systems [12]. The quality of healthcare is influenced by a wide range of factors, these include the care process (coordinated care, safe care, preventative care

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measures and patient preferences), access (timeliness and affordability), administrative efficiency, equity and healthcare outcomes (population health, mortality amenable to healthcare and disease-specific health outcomes) [13].

A major challenge faced by outpatient departments in public healthcare is long waiting time, which has been linked to decreased patient satisfaction and negative perceptions of healthcare quality [2]. Long waiting time not only frustrate patients but can also lead to adverse health outcomes, as delays in receiving care can exacerbate medical conditions [3]. Therefore, addressing this issue is critical for improving the patient experience and ensuring effective healthcare delivery [4]. The length of waiting time varies by country and even within a country, it also varies from one health centre to another; this evidence shows that both developed and developing countries experience problems with long waiting time [16].

Several existing solutions have been proposed to mitigate waiting time. Strategies such as improved appointment scheduling systems, triage protocols, and enhanced patient flow management have been explored [5]. For instance, implementing Electronic Health Record (EHR) systems and online appointment scheduling can streamline the patient intake process, potentially reducing waiting time [6]. By allowing patients to book appointments more flexibly and enabling providers to manage their schedules efficiently, these technologies can significantly reduce waiting times and enhance patient satisfaction. Additionally, the use of patient flow management software has shown promise in optimizing resource allocation and minimizing bottlenecks during peak hours [7]. However, the effectiveness of these solutions varies depending on the specific context and resources available within each healthcare facility [8].

Despite the potential benefits of various interventions, limitations remain in effectively addressing waiting time issues [9]. Many outpatient departments still struggle with understaffing, particularly during peak hours, leading to delays in patient care. Research has shown that patients often have differing tolerances for waiting based on their health conditions and the urgency of their care needs [10]. This study aims to evaluate waiting time and factors influencing health care quality on patient satisfaction within an outpatient department. By examining the relationship between these variables, the research seeks to provide actionable insights that can guide healthcare providers in enhancing patient experiences. The findings are expected to contribute to a better understanding of the importance of managing waiting time.

Material and Methods

Description of the Site

The study was conducted at the outpatient department of Brookfield's Health Centre which is located at the central part of Freetown in the Western region of Sierra Leone. It operates 24 hours. The health centre offers regular medical clinics every day and specialty clinics Monday to Friday. It has a health care team that includes community health officers, nurses, pharmacists, laboratory technicians, cleaners, potters and medical records officers. The facility has 100 nurses, 20 CHOs, and 250 staff members, with a total of 60 beds. The health centre has a several wards and departments, which include the following: ward one (pediatric word) , ward two (Maternal word), ward three (trauma unit), ward four (male word), ward five (Male and Female TB), ward six (general female word), Pharmacy/Drug Store, Mortuary Unit, EPI unit, Laboratory and Blood Bank, Kitchen Department and the Administrative Department is entirely being headed by the CHO In charge. The Outpatient department has ten beds and fifteen employees, and it is overseen by an in-charge.

Research Design

The present study evaluates waiting time and the factors influencing patient satisfaction. The data was collected through structured surveys using questionnaires administered to patients upon their departure from the outpatient department. The surveys included items addressing the constructs employed in the study.

Sampling and Sample Size

Purposive sampling technique was used to select the targeted respondents for the research. A sample is a part of a population that is an accurate representative of that population. Purposive sampling, also known as judgmental or selective sampling, is a non-probability sampling technique where researchers intentionally select individuals or cases that meet specific criteria relevant to the research study. This method allows the researcher to target a particular group of participants who possess particular characteristics or experiences that are of interest to the research objectives. The sample size for this study was 150. This number was determined based on statistical power analysis, aiming to achieve sufficient power (typically 0.80) to detect a medium effect size (Cohen's d = 0.5) at a 95% confidence level (alpha = 0.05).

Study population

The study population was patients who visited the outpatient department at the time of the study and who were present during data collection period. For the patients to be part of the study, they must meet the below criteria.

Inclusion and Exclusion criteria

Inclusion Criteria

1. Patients aged 18 years and older.
2. Individuals who received outpatient services in the healthcare facility.
3. Patients willing to provide consent to participate in the survey.

Exclusion Criteria

1. Patients under 18 years of age.
2. Patients with severe cognitive impairment or language barriers that prevent effective survey participation.
3. Patients receiving emergency care services, as their waiting time and satisfaction factors may significantly differ from those in non-urgent care.

Research Instrument

The structured questionnaire was adopted from studies conducted by [11, 12]. The research instruments cover items on waiting time, patient satisfaction and healthcare quality dimensions. To establish validity, the instrument was tested in a pilot study with a small subset of patients (n = 30) to confirm clarity, ease of understanding, and applicability. Additionally, internal consistency was assessed using Cronbach's alpha, with values above 0.70 indicating satisfactory reliability of the items within the survey.

Ethical Clearance

The Government hospital approved to carrying out the research. Before collecting data, all participants gave informed consent after the purpose of the study was conveyed to all individuals. Confidentiality was also maintained. However, no formal ethical clearance was obtained due to limitations in accessing an ethics review board for this study.

Data Analysis

Data from the survey responses were analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics, such as percentage and frequency were used to summarize the obtained data. Correlational and regression analyses were employed to assess the relationship between independent and dependent variables, with a significance level set at $p < 0.05$ for inferential tests. Reliability and validity.

Results

Table 1 presents the distribution of the study sample based on demographic variables. For gender, 58.7% were male while 41.3% were female. For age, patients between 21-35 years accounted for 38.7% which was the highest while the least was less than 20 years with a percentage of 15.3. Regarding employment status, proportion of respondents were employed (26.7%). Most respondents had bachelor degree (73.3%).

Table 1. Socio- demographic Characteristics of Respondents

Variable	Category	*F*	%
Gender	Female	62	41.3
	Male	88	58.7
Age	Less than 20 years	23	15.3
	21-35 years	58	38.7
	36-50 years	24	16.0
	more than 50 years	45	30.0
Employment status	Employee/ staff	40	26.7
	Housewives	38	25.3
	Retired	15	10.0
	Students	47	31.3
	Others	10	6.7
Education level	High school or below	31	20.7
	Bachelor's Degree	110	73.3
	Master's Degree	6	4.0
	Doctoral Degree	3	2.0

Reliability and Validity

The term "reliability" refers to a measurement that consistently gives results with equal values, it is recommended that a suitable reliability scale value is 0.67 or above [13]. It evaluates the consistency, precision and repeatability of a study. Cronbach's alpha is a research statistic for evaluating the internal consistency, or reliability, of a group of scales or test items [14]. The Cronbach alpha coefficients for the constructs are high and acceptable. Patients' waiting time had four items with a value of 0.824, Patients' satisfaction had three items with a value of 0.796. Accessibility had two items with a value of 0.886. Reliability had four items with a value of 0.841. Lastly, communication had five items with a value of 0.873. The degree to which a survey measures what it claims to measure is known as validity. It refers to how closely a measure's results match the variable for which it was created [15]. For a factor loading to be significant, a threshold of 0.5 as recommended by [16]. Waiting time had a factor loading ranging 0.67-0.77, patient satisfaction within 0.73-0.82, accessibility within 0.70-0.79, reliability within 0.81-0.88 and communication within 0.79-0.86.

Table 2. Reliability and Validity Analysis

Constructs	Items	Loadings	Cronbach's Alpha
Patients' waiting time	3	0.67-0.77	0.824
Patient satisfaction	3	0.73-0.82	0.796
Accessibility	2	0.70-0.79	0.886
Reliability	4	0.81-0.88	0.841
Communication	4	0.79-0.86	0.873

Descriptive Statistics

Waiting Time

The result of patient evaluating waiting time is shown in Table 3 below. It showed that 13.3% of the respondents waited 1-15 minutes, 15.3% waited 16-30 minutes, 19.3% waited for 31-45 minutes, 22.7% waited 46-55 minutes, while 29.3% of respondents waited more than 56 minutes for registration and seeing doctor. The Table also showed that 35.3% of the respondents stayed 1-15 minutes, 23.3% waited 16-30 minutes, 10.0% stayed 31-45 minutes, 18.0% spent 46-55 minutes, and 13.3% spent over 56 minutes during consultation. The Table further revealed that 26.7% of the respondents waited 1-15 minutes, 25.3% waited 16-30 minutes, 14.0% waited 31-45 minutes. 22.0% waited 46-55 minutes, 18.0% waited 56 minutes or above after consultation to get their prescription.

Table 3. Patient Evaluation on Waiting Time

Items	Scale	N	Percentage (%)
How long did registration and waiting for the doctor take?	1-15 minutes	20	13.3
	16-30 minutes	23	15.3
	31-45 minutes	29	19.3
	46-55 minutes	34	22.7
	Above 56 minutes	44	29.3
How long did the consultation time take?	1-15 minutes	53	35.3
	16-30 minutes	35	23.3
	31-45 minutes	15	10.0
	46-55 minutes	27	18.0
	Above 56 minutes	20	13.3
How long after consultation did you wait to get your prescription?	1-15 minutes	40	26.7
	16-30 minutes	38	25.3
	31-45 minutes	21	14.0
	46-55 minutes	33	22.0
	Above 56 minutes	18	12.0

Accessibility

Table 4 reveals that 32.7% of the respondents agreed that the hospital is approachable, 26.7% strongly agreed, 10.0% were neutral, 17.3% strongly disagreed while 13.3% disagreed. As expected from a public facility, most respondents agreed that the health service charge of hospital is affordable (28.0%).

Table 4. Patient Evaluation on Accessibility

Items	Scale	N	Percentage (%)
The hospital is approachable	Strongly disagree	26	17.3
	Disagree	20	13.3
	Neutral	15	10.0
	Agreed	49	32.7
	Strongly agreed	40	26.7
Health service charge of hospital is affordable	Strongly disagree	23	15.3
	Disagree	36	24.0
	Neutral	22	14.7
	Agreed	42	28.0
	Strongly agreed	27	18.0

Reliability

Table 5 indicates that 29.3% of the respondents strongly disagreed, 17.3% disagreed 20.7% agreed and 18.0% strongly agreed that the hospital carries out guaranteed health services to cover requirements of patient. The Table also shows that 16.7% agreed, 14.0% strongly agreed, 27.3% disagreed and 3.3% strongly disagreed that staff working hospital can manage issues in a good manner and on time while 38.7% were neutral. The Table also reveals that the hospital gives service with guaranteed date and time, 36.0% agreed, 12.0% strongly agreed, 10.7 strongly agreed, 25.3% disagreed and 16.0% were neutral. Most respondents were neutral (34.0%) about the hospital keeping up secure information and data entry records, 16.7% agreed, 12.7% strongly agreed, 9.3% strongly disagreed and 27.3% disagreed.

Table 5. Patient Evaluation on Reliability

Items	Scale	N	Percentage (%)
The hospital carries out guaranteed health services to cover requirements of patient	Strongly disagree	44	29.3
	Disagree	26	17.3
	Neutral	22	14.7
	Agreed	31	20.7
	Strongly agreed	27	18.0
Staff working hospital can manage issues in a good manner and on time	Strongly disagree	5	3.3
	Disagree	41	27.3
	Neutral	58	38.7
	Agreed	25	16.7
	Strongly agreed	21	14.0
Hospital gives service with guaranteed date and time	Strongly disagree	16	10.7
	Disagree	38	25.3
	Neutral	24	16.0
	Agree	54	36.0
	Strongly agree	18	12.0

Hospital keeps up secure information and data entry records	Strongly disagree	14	9.3
	Disagree	41	27.3
	Neutral	51	34.0
	Agree	25	16.7
	Strongly agree	19	12.7

Communication

Table 6 shows 19.3% strongly disagreed, 34.0% disagreed, 11.3% agreed while 18.7 strongly agreed that they received enough explanation for each test they undergo. It was also revealed that 35.3% agreed that the physicians were ready to answer all questions related to the illness. Majority of the respondents strongly agreed (31.3%) that the providers gave enough information about their therapy. However, 34.0% strongly disagreed that the health workers of hospital use language patients can easily understand.

Table 6. Patient Evaluation on Communication

Items	**Scale**	**N**	**Percentage (%)**
I received enough explanation for each test I undergo	Strongly disagree	29	19.3
	Disagree	51	34.0
	Neutral	25	16.7
	Agreed	17	11.3
	Strongly agreed	28	18.7
The physicians were willing to reply all questions related to my illness	Strongly disagree	23	15.3
	Disagree	43	28.7
	Neutral	16	10.7
	Agreed	53	35.3
	Strongly agreed	15	10.0
The providers gave enough information of my therapy	Strongly disagree	18	12.0
	Disagree	29	19.3
	Neutral	25	16.7
	Agreed	31	20.7
	Strongly agree	47	31.3
Health workers of hospital use language patients can easily understand	Strongly disagree	51	34.0
	Disagreed	22	14.7
	Neutral	49	32.7
	Agreed	21	14.0
	Strongly agreed	7	4.7

Patient Satisfaction

Table 7 showed that 29.3% strongly disagreed that they were satisfied with health service from the hospital while 20.0% strongly agreed. Most respondents (42.7%) disagreed that they were treated in a friendly and kind manner. Most patients disagreed with the hospital frontline workers on registration and emergency (38.0%).

Table 7. Patient Evaluation on Patient Satisfaction

Questions	Scale	N	Percentage (%)
I was satisfied health service received from this hospital	Strongly disagree	44	29.3
	Disagree	40	26.7
	Neutral	16	10.7
	Agreed	20	13.3
	Strongly agreed	30	20.0
The hospital workers treat me in a friendly and kind manner, I am satisfied	Strongly disagree	27	18.0
	Disagree	64	42.7
	Neutral	6	4.0
	Agreed	30	20.0
	Strongly agreed	23	15.3
I am satisfied with how hospital frontline staff attend to emergency and registration	Strongly disagree	43	28.7
	Disagree	57	38.0
	Neutral	30	20.0
	Agreed	20	13.3
	Strongly agreed	-	-

Correlation and Regression

The analysis represented in Table 8 revealed a significant association between the variables which met the criteria for conducting the regression analysis. Regression analysis is a statistical method used to examine the relationship between one or more independent variables (predictors) and a dependent variable (outcome). It helps to understand how the dependent variable changes when one or more independent variables change while holding other factors constant [17]. The regression result revealed a significant result on the variables.

Table 8. Correlation and Regression Analysis

Path	B	p	Decision
Waiting time-patient satisfaction	0.608	0.001	Supported
Accessibility-patient satisfaction	0.578	0.034	Supported
Reliability-patient satisfaction	0.677	0.025	Supported
Communication-patient satisfaction	0.589	0.041	Supported

Discussion

This present study aims to evaluate waiting time and factors influencing health care quality on patient satisfaction within an outpatient department. Patients' satisfaction is a key component for measuring the quality of healthcare. The findings reveal that waiting time has an impact on patient satisfaction which is supported by the findings of [18] in Saudi Arabia. Their study investigated the level of satisfaction with various aspects of care services, one of which was waiting, which revealed that waiting time had a significant association with patient satisfaction. Another study undertaken by [19] found a substantial link between waiting hour and client satisfaction. According to the result of their study, the participants were dissatisfied with the hour waited in the facility. It was found that if

the patient's waiting time at a public hospital is extended, their attitude will change. Moreso, a study conducted by [20] also demonstrated that an increased length of waiting hours, especially between filling form and consultation, resulted in an increased rate of dissatisfaction. Also, a study conducted by [21] revealed that the overall satisfaction and clinic wait time (CWT) showed a negative and significant correlation.

Reliability is the ability to deliver promised services consistently and accurately, i.e., when something is promised, it is delivered, and services are delivered on time [22]. It was observed that patient satisfaction is affected by the attitude of health workers, the ability to provide immediate attention, the ability to send information, and the physicians' willingness to simply explain to the patient what is wrong before providing information about their medications and the environment. The majority of patients of this study were satisfied with the reliability of this study's findings which is supported by the finding of [23] and [24].

Communication is the most important aspect in improving healthcare service quality and patient satisfaction [25]. The findings revealed how patients are given clear explanations and sufficient information about the tests they are undergoing. Healthcare staff, notably physicians, provided extensive information regarding patient care and health status. If a physician is perceived as being attentive, and empathetic, patients are likely to experience a positive exchange and attain satisfaction with their care [26].

Accessibility is essential in impacting patient satisfaction, as it determines the ease with which patients can obtain healthcare services. healthcare facilities that are readily available, well-located, and equipped with sufficient medical personnel provides patients with positive experiences. Accessibility includes factors such as geographical proximity, affordability and appointment availability. The implementation of strategies to enhance accessibility such as extended service hours and efficient appointment scheduling makes patients feel more valued and experience greater trust in the healthcare system. The obtained finding is in tandem with those of [15] and [27].

Conclusion

This study shows the significant impact of waiting time on patients' satisfaction and the perceived quality of healthcare services in the outpatient department of hospitals. The findings highlight that longer waiting times are directly associated with lowers levels of patient satisfaction, revealing the importance of efficient patient flow and timely service delivery. The findings also show the relevance of reliability, accessibility and effective communication as factors impacting the level of patient satisfaction in public healthcare. The implications of these findings extend beyond mere acknowledgment of patient dissatisfaction; they serve as a call to action for healthcare administrators and policymakers. By prioritizing strategies to minimize waiting times, such as optimizing appointment scheduling, improving staff efficiency, and streamlining patient flow processes as well as addressing other factors, healthcare facilities can significantly enhance patient satisfaction and trust in service delivery.

Conflict of Interest

The author declares no conflict of interest.

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References

[1]. Ferreira, D. C., Vieira, I., Pedro, M. I., Caldas, P., & Varela, M., 2023, Patient Satisfaction with Healthcare Services and the Techniques Used for its Assessment: *A Systematic Literature Review and a Bibliometric Analysis. Healthcare*, 11(5), 639, doi: 10.3390/healthcare11050639

[2]. Alrasheedi, K. F., Al-Mohaithef, M., Edrees, H. H., & Chandramohan, S., 2019, The association between wait times and patient satisfaction: findings from primary health centers in the Kingdom of Saudi Arabia. *Health Services Research and Managerial Epidemiology*, 6, 2333392819861246, doi: 10.1177/2333392819861246.

[3]. Marshall, E. G., Miller, L., & Moritz, L. R., 2023, Challenges and impacts from wait times for specialist care identified by primary care providers: results from the MAAP study cross-sectional survey. *In Healthcare management forum*, 36 (5), 340-346, doi: 10.1177/08404704231182671.

[4]. Addis, B. A., Gelaw, Y. M., Eyowas, F. A., Bogale, T. W., Aynalem, Z. B., & Guadie, H. A., 2023, Time wasted by health professionals is time not invested in patients: time management practice and associated factors among health professionals at public hospitals in Bahir Dar, Ethiopia: a multicenter mixed method study. *Frontiers in Public Health*, 11, 1159275, doi: 10.3389/fpubh.2023.1159275.

[5]. Mwanswila, M. J., Mollel, H. A., & Mushi, L. D., 2024, Outcome evaluation of technical strategies on reduction of patient waiting time in the outpatient department at Kilimanjaro Christian Medical Centre—Northern Tanzania. *BMC Health Services Research*, 24(1), 785, doi: 10.1186/s12913-024-11231-5.

[6]. Jalloh, A. A., Nwosu, L. C., & Baysan, S., 2023, Evaluation of waiting time and associated factors influencing patient satisfaction levels in an outpatient department: A case study of government hospital in Sierra Leone. *Science, Engineering and Health Studies*, 23050015, doi: 10.69598/sehs.17.23050015.

[7]. Al Harbi, S., Aljohani, B., Elmasry, L., Baldovino, F. L., Raviz, K. B., Altowairqi, L., & Alshlowi, S., 2024, Streamlining patient flow and enhancing operational efficiency through case management implementation. *BMJ Open Quality*, 13(1), e002484, doi: 10.1136/bmjoq-2023-002484.

[8]. Guimarães, T., Lucas, K., & Timms, P., 2019, Understanding how low-income communities gain access to healthcare services: A qualitative study in São Paulo, Brazil. *Journal of Transport & Health*, 15, 100658. Doi: 10.1016/j.jth.2019.100658.

[9]. Shen, Y., & Lee, L. H., 2018, Improving the wait time to consultation at the emergency department. *BMJ Open Quality*, 7(1), doi: 10.1136/bmjoq-2017-000131.

[10]. Nwosu, L. C., Edo, G. I., & Jalloh, A. A., 2023, Mediating role of patient trust in the impact of perceived physician communication on treatment adherence and its implication in healthcare industry. Science, *Engineering and Health Studies*, 23050026, doi: 10.69598/sehs.17.23050026.

[11]. Dat, L. T., 2019, Associations Between Waiting Time and Patient Satisfaction Level at Tan Phu District Hospital in Ho Chi Mihn City, V*ietham.*

[12]. Pearse, J., 2005, Review of patient satisfaction and experience surveys conducted for public hospitals in Australia: a research paper for the steering committee for the review of government service provision. *St Leonards, Australia: Health Policy Analysis Pty Ltd.*

[13]. Mohajan, H. K., 2017, Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, 17(4), 59-82.

[14]. Taber, K. S., 2018, The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48, 1273-1296, doi: 10.1007/s11165-016-9602-2.

[15]. Rostami, M., Ahmadian, L., Jahani, Y., & Niknafs, A., 2019, The effect of patient satisfaction with academic hospitals on their loyalty. *The International Journal of Health Planning and Management*, 34(1), e726-e735, doi: 10.1002/hpm.2685.

[16]. Caviglia, M., Dell'Aringa, M., Putoto, G., Buson, R., Pini, S., Youkee, D., & Barone-Adesi, F., 2021, Improving access to healthcare in Sierra Leone: the role of the newly developed national

emergency medical service. *International Journal of Environmental Research and Public Health*, 18(18), 9546, doi: 10.3390/ijerph18189546.

[17]. Cramer, D., & Howitt, D. L., 2004, The Sage dictionary of statistics: a practical resource for students in the social sciences.

[18]. Almoajel, A., Fetohi, E., & Alshamrani, A., 2014, Patient satisfaction with primary health care in Jubail City, Saudi Arabia. *World J Med Sci*, 11(2), 255-64, Doi: 10.5829/idosi.wjms.2014.11.2.84172.

[19]. Bamidele, A. R., Hoque, M. E., & Van Der Heever, H., 2011, Patient satisfaction with the quality of care in a primary health care setting in Botswana. *South African Family Practice*, 53(2), doi: 10.1080/20786204.2011.10874080.

[20]. Alnemer, K. A., Al-Homood, I. A., Alnemer, A. A., Alshaikh, O. M., Alsaidan, M. A., & Alzahrani, A. T., 2015, A multicenter study of factors affecting patient's satisfaction visiting primary health care clinics in Riyadh, Saudi Arabia. *Fam Med Med Sci Res*, 4(169), 1-4, Doi: 10.4172/2327-4972.1000169.

[21]. Oche, M. O., & Adamu, H., 2013, Determinants of patient waiting time in the general outpatient department of a tertiary health institution in North Western Nigeria. *Annals of Medical and Health Sciences Research*, 3(4), 588-592, doi: 10.4103/2141-9248.122123.

[22]. Li, J., Zhu, G., Luo, L., & Shen, W., 2021, Big Data-Enabled Analysis of Factors Affecting Patient Waiting Time in the Nephrology Department of a Large Tertiary Hospital. *Journal of Healthcare Engineering*, 2021(1), 5555029, doi: 10.1155/2021/5555029.

[23]. Bahammam, F. A., 2023, Satisfaction of clinical waiting time in ear, nose & throat departments of the Ministry of Health in Jeddah, Saudi Arabia. *Health Services Insights*, 16, 11786329231183315, doi: 10.1177/11786329231183315.

[24]. Morales, J., Silva-Aravena, F., & Saez, P., 2024, Reducing Waiting Times to Improve Patient Satisfaction: A Hybrid Strategy for Decision Support Management. *Mathematics*, 12(23), 3743, doi: 10.3390/math12233743.

[25]. Bleustein, C., Rothschild, D. B., Valen, A., Valatis, E., Schweitzer, L., & Jones, R., 2014, Wait times, patient satisfaction scores, and the perception of care. *The American Journal of Managed Care*, 20(5), 393-400.

[26]. Zhang, H., Ma, W., Zhou, S., Zhu, J., Wang, L., & Gong, K., 2023, Effect of waiting time on patient satisfaction in outpatient: An empirical investigation. *Medicine*, 102(40), e35184, doi: 10.1097/MD.0000000000035184.

[27]. Hwang, J., Vu, G. T., Tran, B. X., Nguyen, T. H. T., Nguyen, B. V., Nguyen, L. H., & Ho, R. C., 2020, Measuring satisfaction with health care services for Vietnamese patients with cardiovascular diseases. *PLoS One*, 15(6), e0235333, Doi: 10.1371/journal.pone.0235333.

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Prevalence of Non-Communicable Diseases among People living with HIV on Antiretroviral Therapy in Enugu, Southeast Nigeria

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Abstract

Human Immunodeficiency Virus remains a global public health concern, with over 91.4 million people affected worldwide and 3.2 million in Nigeria. While lifelong Antiretroviral Therapy (ART) has improved survival, concerns persist about its link to non-communicable diseases (NCDs). This study investigated the prevalence of NCDs and associated risk factors among People Living with HIV (PLHIV) on ART in Enugu, Southeast Nigeria. A hospital-based cross-sectional design was employed to abstract socio-demographic and clinical data from adult PLHIV (≥18 years). Data were analyzed using IBM SPSS Statistics 25, with results presented as frequencies, percentages, and mean ± standard deviation. Adjusted odds ratios and p-values ≤0.05 at 95% confidence interval were used to test associations. Hypertension (17%) was the most prevalent NCD, followed by obesity (13%) and diabetes (1.3%). Socio-demographic analysis showed most participants were aged 41–60 years, married, educated at the secondary level, and employed. Females were significantly associated with higher prevalence of hypertension and obesity ($p < 0.05$). Age, marital status, education, and occupation predicted NCD onset. The study concludes that hypertension is a leading NCD among PLHIV in Enugu and a major risk factor for cardiovascular diseases. Integrating routine screening into HIV services and engaging policymakers to institutionalize preventive interventions are recommended to improve the quality of life of PLHIV.

Keywords*: Antiretroviral Therapy, Human Immunodeficiency Disease, Non-Communicable Diseases, People Living with HIV (PLHIV), Predictors, Prevalence.*

Introduction

The advent of Antiretroviral Therapy (ART) has transformed HIV from a fatal disease to a manageable chronic condition, significantly extending the lifespan of People Living with HIV (PLHIV). However, this increased longevity has brought to light a new set of health challenges, prominently among them the rising incidence of Non-Communicable Diseases (NCDs) [1]. NCDs, which include cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases, are now a leading cause of morbidity and mortality globally, and PLHIV on ART are particularly susceptible to these conditions [1, 2].

The prevalence of non-communicable diseases (NCDs) has been discovered to vary across different populations and sub-groups; a study conducted in Ghana found the overall prevalence of selected NCDs to be 26.7%, with hypertension being the most common at 22.7% [3]. A large study in Qatar found out approximately 16% of the total population had one or more NCDs. The age-adjusted prevalence rates per 1000 population were: Coronary Heart Disease (CHD) 16, stroke 1, Peripheral Vascular Disease (PVD) 0.3, cancers 6.1, chronic obstructive pulmonary diseases (COPD), and type 2 diabetes 201.4. [4]. Another study conducted among university employees in India indicated that the overall

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prevalence of NCDs was found to be 10.15% with the prevalence of diabetes, cardiovascular diseases and hypertension at 7.2%, 3.2% and 17% respectively [5]. In Nigeria, the prevalence of hypertension, diabetes and dyslipidemia was found to be 35.3%, 4.6%, and 10.3% respectively [6, 7].

Furthermore, several studies have reported the prevalence of non-communicable diseases (NCDs) among people living with HIV (PLHIV) on antiretroviral therapy (ART); A study conducted in Busia County, Kenya, the overall prevalence of NCDs among PLHIV was high, with hypertension being the most common at 73.3%, followed by arthritis at 15.6% [8]. In Kagera, Tanzania, 57.8% of PLHIV on ART reported having at least one NCD, with arthritis being the most common (57.8%) [9]. A study conducted among key population living with HIV on ART in Kenya, found the prevalence of NCDs to be 18.3% [10]. Another study in Cambodia reported a prevalence of 23.9% NCDs among PLHIV with hypertension being the most common [11]. In Nigeria, a study conducted in Makurdi found the prevalence of NCDs among PLHIV on ART to be 17.7%, with hypertension affecting 15.5% and diabetes mellitus affecting 1% [12].

The risk factors associated with Non-Communicable Diseases (NCDs) among People Living with HIV (PLHIV) on Antiretroviral Therapy (ART) are multifaceted and can be broadly categorized into biological, lifestyle, and socio-economic factors [13-16]. The long-term use of ART, while crucial for managing HIV, has been associated with metabolic side effects such as dyslipidemia, insulin resistance, and changes in body fat distribution [17-21]. These side effects contribute to the heightened risk of developing NCDs among PLHIV. Furthermore, the persistent immune activation and chronic inflammation resulting from HIV infection, even when controlled, exacerbate the risk of NCDs [22, 23]. Lifestyle factors also play a significant role. Unhealthy dietary habits, physical inactivity, smoking, and excessive alcohol consumption are prevalent among PLHIV and further elevate the risk of NCDs [24, 25]. Socioeconomic factors, including poverty, lack of education, and limited access to healthcare, compound these risks by hindering effective disease management and prevention efforts [26]. In Enugu, Southeastern, Nigeria, as in many other regions, the intersection of HIV and NCDs presents a complex healthcare challenge. Limited studies have been conducted to explore factors associated with non-communicable diseases among PLHIV on ART, especially in Nigeria. This study aims to explore the prevalence and predictors of NCDs among PLHIV on ART in Enugu State and to identify effective interventions to manage and prevent these conditions. By examining the interplay between HIV and NCDs and assessing current healthcare practices and community-based interventions, the research seeks to provide insights that can inform policy and improve healthcare delivery for this vulnerable population.

Materials and Methods

Study Design

This study employed a hospital-based cross-sectional study design to investigate prevalence and risk factors of non-communicable diseases (NCDs) among people living with HIV (PLHIV) of age ≥18yrs on Antiretroviral Therapy (ART) in Enugu, Southeast Nigeria.

Study Area

Enugu State, located in the southeastern region of Nigeria (Latitude: 6.5° N and Longitude: 7.5° E), is a significant economic, geographical, and socio-economic hub. The state's economy is primarily driven by agriculture, with major crops including cassava, yams, and cocoa. Additionally, Enugu State is known for its rich mineral deposits, including coal, iron ore, and limestone, which contribute to its industrial and manufacturing sectors. The

state's strategic location along the major transportation routes of the East-West Highway and the Enugu-Umuahia-Port Harcourt Expressway makes it an important commercial center, facilitating trade and commerce within the region [27].

Geographically, Enugu State is characterized by a tropical savanna climate. The state's topography is marked by the presence of several rivers, including the Anambra and the Niger, which provide water resources for irrigation, drinking, and other uses. As well as characterized by its rolling hills, plateaus, and valleys, with an average elevation that provides a cooler climate compared to the tropical regions of Nigeria, it is bounded to the north by Kogi and Benue States, to the south by Abia State, to the east by Ebonyi State, and to the west by Anambra State. Furthermore, Enugu State's proximity to the Atlantic Ocean and its coastal cities, such as Port Harcourt, makes it an important link in Nigeria's maritime trade [28].

The health sector in Enugu State is a significant area of focus, with several major hospitals and healthcare facilities, including the University of Nigeria Teaching Hospital (UNTH) in Ituku-Ozalla and the Enugu State University Teaching Hospital (ESUTH) in Parklane. These institutions provide a range of medical services, including primary care, specialist care, and emergency services. The state also has a number of private healthcare facilities, offering additional options for patients. However, the health sector in Enugu State faces significant challenges, including inadequate infrastructure, limited resources, and a shortage of skilled healthcare professionals. These challenges have significant impacts on the health and well-being of the state's population [29, 30].

Socio-economically, Enugu State is characterized by a mix of urban and rural populations, with the state capital, Enugu, being the largest urban center. The urban areas, particularly Enugu City, are bustling with commercial activities, educational institutions, and cultural events, contributing to a higher standard of living and increased opportunities for residents. Conversely, rural areas predominantly depend on agriculture, with subsistence farming being a common practice. The state's population is predominantly Igbo, with significant minority groups from other ethnic and religious backgrounds. The state's socio-economic profile is marked by a relatively high level of poverty, with many residents relying on subsistence farming and informal employment. However, the state is also home to a growing middle class, with increasing access to education, healthcare, and other social services. Administratively, the state is divided into three senatorial zones and seventeen Local Government Area [31, 32].

Study Site

The study was conducted in randomly selected health facilities providing HIV care and treatment in Enugu, Southeast Nigeria. Enugu State was randomly selected amongst five states that form the Southeastern region of Nigeria.

Study Population

The study was conducted among People living with HIV (PLHIV) age ≥18yrs, initiated on ART in Enugu State, Nigeria.

Sample Size Determination

The estimated number of mothers recruited for the study was determined using the sample size formula for estimation of single proportion.

$$N = \frac{Z^2 pq}{d^2}.$$

Where Z = 1.96 (standard normal deviate); p = 50% = 0.50 (assumed prevalence of NCDs among PLHIV in South East Nigeria), q = 1-p; and d = Level of precision set at 0.05 (95% confidence interval)

$$N = ((1.96)^2 * 0.5 * 0.5))/0.05\text{^}2$$

$$N = 384.16.$$

$$\boldsymbol{Non - response\ rate = \frac{n}{1 - Q}}.$$

Q = proportion of non-response = 10%

$$Non-response\ rate = \frac{n}{1-\left(\frac{10}{100}\right)}$$

$$= \frac{384}{1-\left(\frac{10}{100}\right)}$$

$$= 426.6.$$

Therefore, final sample size was approximated to be equal to 427.

Sampling Procedure

Multi-stage sampling technique was employed to select Local Government Areas (LGAs), health facilities and eligible clients that took part in the study. The three stages of sampling are further delineated below:

Stage 1

The State was clustered into 3 areas based on the senatorial zones (see Table 1).

Table 1. Distribution of LGAS Per Each Senatorial in Enugu, Southeast Nigeria

S/N	Local Govt. Area	Senatorial Zone
1	Igbo-Eze North	Enugu North
2	Igbo-Eze South	
3	Igbo-Etiti	
4	Nsukka	
5	Uzo-Uwani	
6	Udenu	
7	Enugu East	Enugu East
8	Enugu North	
9	Enugu South	
10	Nkanu East	
11	Nkanu West	
12	Isi-Uzo	
13	Aninri	Enugu West
14	Awgu	
15	Ezeagu	
16	Oji River	
17	Udi	

A sample frame of all Local Government Area in each senatorial zone was obtained after which proportional allocation was utilized to calculate the number of LGAs that will be selected from each of the Senatorial zones in the study area. This is illustrated in Table 2.

Table 2. Proportional Allocation of LGAs to be Selected in Each Political Zone

Political Zones	Number of LGAs in each Zone	number of LGAs to be selected from each zone (Proportional Allocation)
Enugu North	6	$\left(\frac{6}{17}\right) * 5 = 2$
Enugu East	6	$\left(\frac{6}{17}\right) * 5 = 2$

Enugu West	5	$\left(\frac{5}{17}\right) * 5 = 1$
TOTAL	**17**	**5**

Simple random sampling technique was used to select the LGAs where the study will be conducted.

Two (2) LGAs were randomly selected from Enugu North and Enugu East Senatorial zones while one (1) LGA was randomly selected from Enugu West Senatorial zone respectively, using proportional allocation as illustrated in Table 2.

Eligibility Criteria

Inclusion Criteria

The following inclusion criteria was used to select eligible participants for the purpose of achieving the research objectives.

1. People living with HIV (PLHIV) aged ≥18 years and are currently engaged in HIV and care and treatment at the time of the study.
2. People living with HIV (PLHIV) who have been on ART for at least six months and actively engaged in HIV and care and treatment at the time of the study.
3. People living with HIV (PLHIV) on HIV Care and treatment who are willing to participate and provide informed consent.

Exclusion Criteria

The following exclusion criteria were used to exclude ineligible participants from the study.

1. People living with HIV (PLHIV) who are not on ART.
2. People living with HIV (PLHIV) who are below 18 years of age.
3. People living with HIV (PLHIV) on HIV care and treatment who do not consent to participate in the study.

Instrument for Data Collection

A medical health informatics script was designed and used to retrieve client level information of study participants from the hospital based electronic medical records (EMR). Clinical chart abstraction was carried out to obtain clinical, socio-demographic, NCDs records and treatment information of study participants not originally captured on the EMR.

Data Collection Method

Data was collected using Research assistants were recruited across the randomly selected facilities to work in the study. A 2-days training session was conducted for members of the research team prior to field visit. This was done to acquaint them with the objectives, data instruments and methodology. The process was facilitated by the lead researcher and trained health educators with sound knowledge of the subject matter.

Data Management and Analysis

Data was entered into and analyzed using IBM SPSS Statistics 25 software. Continuous variables were summarized as mean ± standard deviation if normally distributed; otherwise, median and range were presented. The hypotheses were tested using ordinal regression model and *p* values less than or equal to 0.05 were considered significant at 95% confidence interval.

Ethical Considerations

Ethical approval was obtained from the Enugu State Ministry of Health Ethical Review Committee and permission was granted by the Hospital management of the selected health facilities where the study took place. Informed consent was obtained from individual study participants, explaining that the study could be terminated at any time the participant opted out while ensuring confidentiality, anonymity, privacy and security of the participants' information. Furthermore, participation in the study was made strictly voluntary without any form of coercion.

Results

Prevalence of NCDs among PLHIVs

In this study, 5015 out of 8182 patients in the abstracted data had any evidence of NCD in their HIV clinical record signifying a weighted total percentage of 76.96% (95% CI: 68.33 – 79.19) as shown in Table 3. No significant difference was observed in the proportion of prevalence among the PLHIVs presenting with different NCD type in the study population (χ^2 = 3.321, p > 0.205). The prevalence of hypertension among PLHIVs on ART was observed to be 17% (95% CI: 12.72 – 25.83) while prevalence for diabetes and obesity was shown to be 1.27% (95% CI: 1.15 – 2.03) and 13.35% (95% CI: 10.78 – 29.71) respectively with the highest prevalence observed for cervical cancer at 40.87% (95% CI: 30.75 – 47.92) and an overall prevalence of NCDs comorbidity in PLHIVs on ART to be 72.49% although no significant difference (χ^2 = 5.35, p > 0.617) was observed in the prevalence distribution.

Table 3. Prevalence of NCDs among PLHIVs on ART in Enugu, Southeast Nigeria

NCD	Frequency	Prevalence (95% CI)	No on ART	Prevalence (95% CI)
Hypertension	1144	13.98 (10.59 – 17.93)	853	17.00 (12.72 – 25.83)
Diabetes	81	0.98 (0.85 – 3.47)	64	1.27 (1.15 – 2.03)
Obesity	910	11.12 (9.07 – 13.23)	670	13.35 (10.78 – 29.71)
Cervical cancer	2880	50.88 (32.3 - 59.97)	2050	40.87 (30.75 – 47.92)
Total	5015	76.96	3637	72.49
$\chi2$ = 3.321, p > 0.205			$\chi2$ = 5.35, p > 0.617	

Distribution of NCDs among PLHIVs on ART in Enugu, Southeast Nigeria

The distribution of NCDs among PLHIVs is presented in Table 4. From the study population, it was observed that out of 8182 records of PLHIVs, 1144 individuals representing 13.98% (95% CI: 11.05 – 15.27) of the total study sample size had hypertension with 16.47% (95% CI: 13.47 – 19.93) on ART and 9.68% (95% CI; 7.65 – 11.14) not on ART. These values were shown to be not statistically significant (p = 0.32) between subjects on ART and not on ART. Similarly, 0.98% (95% CI: 0.71 – 1.12) of the 8182 records were shown to have diabetes representing 81 individuals of study participants with 1.23% (95% CI: 0.83 – 1.48) on ART and 99.43 (95% CI: 86.54 – 104.53) not on ART. This was also observed to be not statistically significant (p = 0.15). Likewise, 11.12% (95% CI: 9.92 – 14.95) representing 910 individuals were observed to present with obesity among the study participants with 12.94% (95% CI; 9.87 – 14.93) being on ART and 7.98% (95% CI: 5.63 – 10.91) not on ART indicating a statistically insignificant difference (p = 0.10). However, statistical difference (p = 0.032) was observed between those on ART and not on ART among PLHIVs who did not present obesity as an NCD in the study population. Approximately half of the study population (50.88%: 95% CI: 35.92 – 54.13) representing 2880 participants of the 5660 female participants presented with cervical cancer as an NCD. In addition, 54.69% (95% CI: 48.32 – 55.67) were on ART while 43.41% (95% CI: 37.65 – 48.91) of those who had cervical cancer were found not to be on ART. This was, however, found to be statistically significant (p = 0.007) at 95% confidence interval.

Table 4. Distribution of NCDs among PLHIVs on ART in Enugu, Southeast Nigeria

NCD	Total	% (95% CI)	No on ART	% On ART (95% CI)	Not on ART	% Not on ART (95% CI)	p-value
Hypertension (N = 8182)							
No	7038	86.01 (78.94 – 90.51)	4324	83.52 (78.67 – 91.02)	2714	90.31 (87.81 – 94.22)	0.205
Yes	1144	13.98 (11.05 – 15.27)	853	16.47 (13.47 – 19.93)	291	9.68 (7.65 – 11.14)	0.320
Diabetes (N = 8182)							
No	8101	99.01 (95.87 – 104.38)	5113	98.76 (89.51 – 102.56)	2988	99.43 (86.54 – 104.53)	0.112
Yes	81	0.98 (0.71 – 1.12)	64	1.23 (0.83 – 1.48)	17	0.56 (0.23 – 0.67)	0.150
Obesity (N = 8182)							
No	7272	88.87 (78.03 – 95.11)	4507	87.05 (83.97 – 92.07)	2765	92.01 (87.22 – 96.87)	0.032
Yes	910	11.12 (9.92 – 14.95)	670	12.94 (0.83 – 1.48)	240	7.98 (5.63 – 10.91)	0.10
Cervical cancer (N = 5660)							
No	2780	49.11 (38.17 – 53.94)	1698	45.30 (41.78 – 52.43)	1082	56.58 (47.33 – 59.82)	0.112
Yes	2880	50.88 (35.92 – 54.13)	2050	54.69 (48.32 – 55.67)	830	43.41 (37.65 – 48.91)	0.007

Table 5 below shows the prevalence of NCDs among PLHIVs on ART in the study area disaggregated by gender. It was observed that prevalence of hypertension in males was 35.99% (95% CI: 27.83 – 44.29) while females showed a higher prevalence than males at 64.01% (95% CI: 57.86 – 75.92) shown to be statistically significantly difference at 95% confidence interval (p = 0.002). The overall prevalence for diabetes was found to be 1.27% (95% CI: 1.15 – 2.03) with a higher prevalence for females at 68.75% (59.01 – 76.49) than males at 31.25% (95% CI: 26.89 – 39.30) showing a statistically insignificant difference (p = 0.072) at 95% confidence interval. Similarly, obesity had an overall prevalence of 13.35% (95% CI: 10.78 – 29.71) with females observed to have a higher prevalence (77.61% [95% CI: 68.23 – 88.90]) as compared to males (22.38% [95% CI: 17.25 – 28.81]). This was found to be significantly different (p = 0.001) at 95% confidence interval.

Table 5. Prevalence of NCDs in PLHIVs on ART in Enugu, Southeast Nigeria, stratified by gender

NCD	Prevalence % (95% CI)	Males % (95% CI)	Females % (95% CI)	p-value
Hypertension	17.00 (12.72 – 25.83)	35.99 (27.83 – 44.29)	64.01 (57.86 – 75.92)	0.002
Diabetes	1.27 (1.15 – 2.03)	31.25 (26.89 – 39.30)	68.75 (59.01 – 76.49)	0.072
Obesity	13.35 (10.78 – 29.71)	22.38 (17.25 – 28.81)	77.61 (68.23 – 88.90)	0.001
Cervical cancer	40.87 (30.75 – 47.92)	-	71.18	-

Discussion

The current study investigated the prevalence and predictors of non-communicable diseases among people living with HIV on ART in Enugu, Southeast Nigeria with the specific objectives of profiling the socio-demographics of the study participants and analyzing risk factors that may be contributory to developing NCDs in the study population and exploring context-specific interventions for mitigating the double burden of HIV and NCD in developing countries. The methodology employed in the current study was a hospital-based cross-sectional study design predicated on data abstracted from EMR of the sampled health facilities in the study area.

Similar cross-sectional studies conducted in Tanzania [33], South Africa [1], Zimbabwe [34] reported that HIV and NCDs are major problems of public health concern in developing countries in line with the findings of this study that there is a prevalence of NCDs as well as risk factors among PLHIVs on ART.

In the current study, prevalence of hypertension, diabetes, obesity and cervical cancer were observed to be 17% (95% CI: 12.72 – 25.83), 1.27% (95% CI: 1.15 – 2.03), 13.35% (95% CI: 10.78 – 29.71) and 40.87% (95% CI: 30.75 – 47.92) respectively indicating a marked prevalence of hypertension in the study population than the other NCDs with an overall prevalence of NCDs comorbidity in PLHIVs on ART of 72.49%. These findings are in consonance with the study of [1] who reported a higher prevalence of hypertension (34.6%) and obesity/overweight (66.7%) and also that of [35] who reported a prevalence of hypertension of 38% in PLHIVs in Cameroon also higher than that observed in this study. Furthermore, females showed higher prevalence for hypertension (64.01% [95% CI: 57.86 – 75.92]), diabetes (68.75% [95% CI: 59.01 – 76.49]) and obesity (77.61% [95% CI: 68.23 – 88.90]) than males in the study. These findings are in contrast to those reported by [1] who observed higher prevalence of hypertension and obesity in males and females respectively suggesting that females in their study exhibited sedentary lifestyles and indulged in unhealthy dietary patterns. This finding was remarkable among females in the younger age category (18-24). While obesity may have been reported to have protective effects on HIV progression, it has been shown to have serious implications for development of cardiovascular diseases [36]. As women were found to have higher prevalence of NCDs, patients newly initiated on ART are advised not to consume energy-dense or high-calorie foods to avoid risk of developing obesity.

The nexus of a double burden of NCDs and communicable diseases in Africa is not in dispute as reported by [37-39]. The burden of hypertension and related CVDs irrespective of HIV status remains significant [40, 41]. Hypertension was found to be more prevalent in the study as similarly reported by [1, 42]. In this study, women had higher prevalence of hypertension than men, which was found to be in sharp contrast to the study conducted in Kenya were males had a higher hypertension prevalence of 11.2% as compared to 7.4% of females [43]. As suggested by previous studies, hypertension is the leading risk factor for development of cardiovascular diseases in the general population and could be a predisposing risk factor for people living with HIV on ART. With women presenting a higher prevalence of hypertension and other co-morbidities, several risk factors could be contributory ranging from age, gender, marital status, alcohol consumption, tobacco use and consuming unhealthy diets.

Conclusion

The current study findings support the established report that HIV and NCDs are major public health of significant impact in developing countries. This double burden can be addressed by imposing an integrated approach to management of HIV and NCDs in health facilities at both primary, secondary and

tertiary levels of care, which will have context-specific factors affecting the integration [44, 45]. It then can be concluded that there is prevalence of NCDs among PLHIVs on ART and that age and gender are predictors of selected NCDs under study in this work. This invariably suggests an urgent need for health interventions to control risk factors associated with NCD onset in HIV with a view to reducing chronic disease comorbidity. The risk of developing chronic non-communicable diseases is increasingly recognized as a major public health problem in individuals infected with HIV. Based on the findings of the study, the profile of patients infected with HIV and on ART is changing and this will have major implications for clinical care. The ageing HIV-infected population will put new demands on the health-care systems, which will have heavy implications for the health of HIV-infected patients in clinical care.

Conflict of Interest

There is no conflict of interest in this course of this publication.

Recommendations

With the prevalence of NCD indicated among PLHIVs on ART in the study population, it is imperative that urgent steps be taken for proactive interventions ranging from creating awareness of the rising prevalence to institutionalizing public health policies that require integrated screening of risk factors of NCDs among PLHIVs and advocating lifestyle changes that increase quality of life of affected individuals. Governments as relevant stakeholders owe the bulk of the strategy in increasing awareness and creating enabling environment for policies bordering on NCD reduction among PLHIVs to thrive. Without government's support, these cannot be achieved. Furthermore, non-profit governmental organizations can leverage on the findings of this study to implement interventions that border on mitigating NCD occurrence in PLHIVs on ART. Our study indicates that community programs to reduce NCDs can be more effective if context-specific programs are tailored to existing socio-demographic dynamics and risk factors in mind highlighting the importance of evidence-based research on understanding gender differences in advocating for personalized medicine in PLHIV care.

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References

[1]. Oguntibeju, O. O., 2012. Quality of life of people living with HIV and AIDS and antiretroviral therapy. *HIV/AIDS (Auckland, N.Z.)*, 4, 117–124.

[2]. Mathebula, R. L., Maimela, E., & Ntuli, N. S., The prevalence of selected non-communicable disease risk factors among HIV patients on anti-retroviral therapy in Bushbuckridge sub-district, Mpumalanga province. *BMC Public Health*, 20, 247 2020.

[3]. Boakye, H., Atabila, A., Hinneh, T., Ackah, M., Ojo-Benys, F., Bello, A. I., 2023, The prevalence and determinants of non-communicable diseases among Ghanaian adults: A survey at a secondary healthcare level. *PLoS ONE*, 18(2): e0281310.

[4]. Syed, M. A., Alnuaimi, A. S., Zainel, A. J., & A/Qotba, H. A., 2019. Prevalence of non-communicable diseases by age, gender and nationality in publicly funded primary care settings in Qatar. *BMJ Nutrition, Prevention & Health*, 2(1), 20–29.

[5]. Garg, A., Anand, T., Sharma, U., Kishore, J., Chakraborty, M., Ray, P. C., & Ingle, G. K., 2014. Prevalence of Risk Factors for Chronic Non-Communicable Diseases Using WHO Steps Approach in an Adult Population in Delhi. *Journal of Family Medicine and Primary Care*, 3(2), 112–118. https://doi.org/10.4103/2249-4863.137617

[6]. Jackson, I. L., Lawrence, S. M., Igwe, C. N., Ukwe, C. V., & Okonta, M. J., 2022. Prevalence and control of hypertension among people living with HIV receiving care at a Nigerian hospital. *The Pan African Medical Journal*, 41, 153.

[7]. Ilesanmi, O. S., Akpa, O. M., 2020. Prevalence and risk factors of hypertension in HIV-positive adults on antiretroviral therapy in Ondo State, Nigeria. *HIV & AIDS Review*, 19(3), 199-205.

[8]. Akelola, R., Wamukoya, E., & Situma, J., 2024. Effect of Food-based Nutrition Intervention on Management of Non-Communicable diseases among People living with HIV in Busia County Hospital, Kenya. *African Journal of Food, Agriculture, Nutrition and Development*; Vol. 24:1.

[9]. Magafu, M. G., Moji, K., Igumbor, E. U., Magafu, N. S., Mwandri, M., Mwita, J. C., Habte, D., Rwegerera, G. M., & Hashizume, M., 2013. Non-communicable diseases in antiretroviral therapy recipients in Kagera Tanzania: a cross-sectional study. *The Pan African Medical Journal*, 16, 84.

[10]. Achwoka, D., Oyugi, J. O., Mutave, R., Munywoki, P., Achia, T., Akolo, M., Muriuki, F., Muthui, M. and Kimani, J. 2020. High prevalence of non-communicable diseases among key populations enrolled at a large HIV prevention & treatment program in Kenya. *PLoS One*, 2;15(7): e0235606.

[11]. Chhoun, P., Tuot, S., Harries, A. D., Kyaw, N. T, Pal, K., Mun, P., Brody, C., Mburu, G., Yi, S., 2017. High prevalence of non-communicable diseases and associated risk factors amongst adults living with HIV in Cambodia. *Plos One*, 12(11):e0187591.

[12]. Rimamnunra, G. N., Utoo, P. M., Ngwoke, K., Bako, I. A., Akwaras, A. N., Swende, L. T., Omokhua, O.E., Ogbeyi, G. O., Izeji, R. I., Daniel, D. A. & Akobi, M. A., 2023, Prevalence of Non-Communicable Diseases among HIV Positive Patients on Antiretroviral Therapy at a Tertiary Health Facility in Makurdi, North- Central, Nigeria. *The Nigerian Health Journal*; 23(3): 734 –740.

[13]. Kansiime, S., Mwesigire, D., & Mugerwa, H., 2019. Prevalence of non-communicable diseases among HIV positive patients on antiretroviral therapy at joint clinical research centre, Lubowa, Uganda. *PloS one*, 14(8), e0221022. https://doi.org/10.1371/journal.pone.0221022

[14]. Hadavandsiri, F., Shafaati, M., Mohammad Nejad, S., Ebrahimzadeh Mousavi, M., Najafi, A., Mirzaei, M., Narouee, S., & Akbarpour, S., 2023. Non-communicable disease comorbidities in HIV patients: diabetes, hypertension, heart disease, and obstructive sleep apnea as a neglected issue. *Scientific reports*, 13(1), 12730.

[15]. Kagaruki, G. B., Mayige, M. T., Ngadaya, E. S., Kimaro, G. D., Kalinga, A. K., Kilale, A. M., Kahwa, A. M., Materu, G. S. and Mfinanga, S. G., 2014. Magnitude and risk factors of non-communicable diseases among people living with HIV in Tanzania: a cross-sectional study from Mbeya and Dar es Salaam regions. *BMC Public Health*, 14(1):904.

[16]. Coetzee, L., Bogler, L., De Neve, J. W., Bärnighausen, T., Geldsetzer, P., & Vollmer, S., 2019. HIV, antiretroviral therapy and non-communicable diseases in sub-Saharan Africa: empirical evidence from 44 countries over the period 2000 to 2016. *Journal of the International AIDS Society*, 22(7), e25364.

[17]. Finkelstein, J. L., Gala, P., Rochford, R., Glesby, M. J., & Mehta, S., 2015. HIV/AIDS and lipodystrophy: implications for clinical management in resource-limited settings. *Journal of the International AIDS Society*, 18(1), 19033. https://doi.org/10.7448/IAS.18.1.19033

[18]. Willig, A. L., & Overton, E. T., 2016. Metabolic Complications and Glucose Metabolism in HIV Infection: A Review of the Evidence. *Current HIV/AIDS reports*, 13(5), 289–296. https://doi.org/10.1007/s11904-016-0330-z

[19]. Masuku, S., Tsoka-Gwegweni, J. M., Benn. S., 2019. HIV and antiretroviral therapy-induced metabolic syndrome in people living with HIV and

its implications for care: A critical review. Journal of Diabetology. 10. 41. 10.4103/jod.jod_21_18.

[20]. Jumare, J., Dakum, P., Sam-Agudu, N., et al., 2023, Prevalence and characteristics of metabolic syndrome and its components among adults living with and without HIV in Nigeria: a single-center study. *BMC Endocr Disord*, 23, 160. https://doi.org/10.1186/s12902-023-01419-x

[21]. Koethe, J. R., Lagathu, C., Lake, J. E., et al., 2020, HIV and antiretroviral therapy-related fat alterations. *Nat Rev Dis Primers*, 6, 48. https://doi.org/10.1038/s41572-020-0181-1

[22]. Madden, V. J., Parker, R., & Goodin, B. R., 2020. Chronic pain in people with HIV: A common comorbidity and threat to quality of life. *Pain management*, 10(4), 253–260. https://doi.org/10.2217/pmt-2020-0004

[23]. Mazzuti, L., Turriziani, O., Mezzaroma, I., 2023. The Many Faces of Immune Activation in HIV-1 Infection: A Multifactorial Interconnection. *Biomedicines*, 11(1):159.

[24]. Pedroso, C. F., Pereira, C. C., Cavalcante, A. M. R. Z., & Guimarães, R. A., 2023. Magnitude of risk factors for chronic noncommunicable diseases in adolescents and young adults in Brazil: A population-based study. *PloS one*, 18(10), e0292612.
https://doi.org/10.1371/journal.pone.0292612

[25]. Nnate, D. A., Eleazu, C. O., & Abaraogu, U. O., 2021. Ischemic Heart Disease in Nigeria: Exploring the Challenges, Current Status, and Impact of Lifestyle Interventions on Its Primary Healthcare System. *International Journal of Environmental Research and Public Health*, 19(1), 211.

[26]. McMaughan, D. J., Oloruntoba, O., and Smith, M. L., 2020. Socioeconomic Status and Access to Healthcare: Interrelated Drivers for Healthy Aging. *Front Public Health*, 18;8:231. Doi: 10.3389/fpubh.2020.00231.

[27]. Okeke, F. O., Sam-Amobi, C. G., & Okeke, F. I., 2020. Role of local town planning authorities in building collapse in Nigeria: evidence from Enugu metropolis. *Heliyon*, 6(7), e04361.

[28]. Okoli, F. U., Johnson, N.G., & Ejikeme, J. O., 2017. Mapping Groundwater Potential Zones in Enugu State using Remote Sensing and GIS Techniques, *International Journal of Innovative Environmental Studies Research*, 5(1):33-46, Jan.-Mar.,

[29]. Ezeala-Adikaibe, B., Aneke, E., Orjioke, C., Ezeala-Adikaibe, N., Mbadiwe, N., Chime, P., & Okafor, U., 2014. Pattern of medical admissions at Enugu state University of Science and Technology Teaching Hospital: a 5-year review. *Annals of medical and health sciences research*, 4(3), 426–431.

[30]. Abugu, J. O., Chukwu, A. M., Onyeso, O. K., et al. 2023. Determinants of the managerial staff's disposition towards e-payment platforms in public tertiary hospitals in Enugu, Nigeria: a cross-sectional study. *BMC Health Serv Res*, 23, 1240.

[31]. Nnorom, J. C., 2020. Imagining Enugu as classroom for theological education in SIST. A trans-disciplinary approach. *Missionalia*, 48(2), 196-212.

[32]. Egbara, E. A., Ofodu, H., Onuoha, S. N., 2024. Urbanization and Housing Facility in Enugu Urban, Enugu State of Nigeria. *International Journal of Research and Innovation in Social Science*, ISSN No. 2454-6186 | DOI: 10.47772/IJRISS |Volume VII Issue IX.

[33]. Tate, T., Willig, A. L., Willig, J. H., Raper, J. L., Moneyham, L., Kempf, M. C., Saag, M. S., and Mugavero, M. J., 2012. HIV infection and obesity: where did all the wasting go? *Antivir Ther*, 17(7):1281.

[34]. Magodoro, I. M., Esterhuizen, T. M., and Chivese, T., 2016. A cross-sectional, facility-based study of comorbid non-communicable diseases among adults living with HIV infection in Zimbabwe. *BMC Res Notes*, 9(1):379.

[35]. Shah, M., Atta, A., Qureshi, M.I. and Shah, H., 2012. Impact of Socio-economic Status (SES) of Family on the Academic Achievements of Students. *Gomal University Journal of Research*, 28, 12-17.

[36]. Mohammad, A. M., Sheikho, S. K., and Tayib, J. M., 2013. Relation of Cardiovascular Risk Factors with Coronary Angiographic Findings in Iraqi Patients with Ischemic Heart Disease. *Am J Cardiovasc Dis Res.*, 1(1):25–9.

[37]. El-Sadr, W. M, and Goosby, E., 2018. Building on the HIV platform: tackling the challenge of noncommunicable diseases among persons living with HIV. *AIDS (London, England)*, 32: S1–S3.

[38]. Peck, R. N., Shedafa, R., Kalluvya, S., Downs, J. A., Todd, J., Suthanthiran, M, et al., 2014. Hypertension, kidney disease, HIV and antiretroviral therapy among Tanzanian adults: a cross-sectional study. *BMC Med*, 12:125.

[39]. Vorkoper, S., Kupfer, L. E., Anand, N., Patel, P., Beecroft, B., Tierney, W. M., et al., 2018. Building on the HIV chronic care platform to address noncommunicable diseases in sub-Saharan Africa: a research agenda. *AIDS (London, England)*, 32:S107–SS13.

[40]. Rabkin, M., Palma, A., McNairy, M. L., Gachuhi, A. B., Simelane, S., Nuwagaba-Biribonwoha, H., et al., 2018. Integrating cardiovascular disease risk factor screening into HIV services in Swaziland: lessons from an implementation science study. *AIDS (London, England)*, 32: S43–SS6.

[41]. Kwarisiima, D., Balzer, L., Heller, D., Kotwani, P., Chamie, G., Clark, T, 2016. Population-based assessment of hypertension epidemiology and risk factors among HIV-positive and general populations in rural Uganda. *PLoS One*. 2016;11(5): e0156309.

[42]. Alvarez, C., Salazar, R., Galindez, J., Rangel, F., CastaÃ±eda, M.L., et.al.,2010. Metabolic syndrome in HIV-infected patients receiving antiretroviral therapy in Latin America. Braz J Infect Dis.,14(3):256–63.

[43]. Deeks, S. G., and Phillips, A. N., 2009. HIV infection, antiretroviral treatment, ageing, and non-AIDS related morbidity. *BMJ*, 338:a3172.

[44]. Nigatu, T., 2012. Integration of HIV and noncommunicable diseases in health care delivery in low-and middle-income countries. *Prev Chronic Dis*. 2012;9.

[45]. Remais, J. V., Zeng, G., Li, G., Tian, L., and Engelgau, M. M., 2012. Convergence of non-communicable and infectious diseases in low-and middle-income countries. *Int J Epidemiol*, 42(1):221–227.

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Enhancing Academic Support at the University of Guyana Berbice Campus: The Need for a Research & Reference Services Division

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Abstract

University libraries play a critical and active role in the dissemination and use of information through its research and reference services. Like other university libraries, the University of Guyana Berbice Campus Library (UGBCL) does not have a designated division for this purpose but is expected to provide services to patrons in this area. Consequently, the overwhelming number of requests for assistance, mostly placed beyond regular working hours, oftentimes are unfulfilled, thus presenting a major challenge in terms of adequate service delivery. Hence, this study seeks to enhance the academic support services at the University of Guyana Berbice Campus (UGBC) by proposing the establishment of a Research and Reference Services Division (RRSD) within the Library. It focuses on evaluating UGBCL current academic support and identifying areas for enhancement; developing a robust framework for the proposed RRSD; and assessing the feasibility of establishing the same. The data in these areas was collected from students, academic and library staff through web-based surveys and analysed using SPSS and Microsoft Excel applications. From the findings of this study, there is a need for the establishment of a RRSD, to enhance academic support. Further, the result from the Chi-Square test revealed no statistically significant differences in support between the three (3) categories of respondents ($\chi^2(2) = 2.015$, $p = .365$). This suggested a broad consensus across the respondents' categories. The study concluded with recommendations for the successful establishment of a RRSD at the UGBCL which includes fostering collaboration with academic divisions, employing qualified staff, among others.

Keywords: *Academic Libraries, Academic Support, Reference Services, Research Division, University of Guyana Berbice Campus Library.*

Introduction

Overview

University libraries being the heart of their parent institutions, play a crucial role in supporting teaching, learning and research. In this information era, it's important for university libraries not only to build their collection but assist patrons with their research and information needs. Thus, the University of Guyana Berbice Campus Library (UGBCL) is not exempted from this provision. To circumvent the library's limitations of offering the services of a Research and Reference Services Division (RRSD) to its patrons and in an attempt to meet their diverse needs and further to prove their relevance in this information society, UGBCL offers Information Literacy (IL) sessions. IL put simply is the ability to locate, evaluate and use information effectively, critically and ethically. IL is consider as a new art that extends beyond the knowledge of using computers and accessing information to a critical reflection of the type of information and its impact [1].

While IL does not cover all of the immediate RRSD needs of the UGBCL patrons, it certainly assists patrons with some of their needs. The

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initial offerings at the UGBCL were packaged to include the most common areas, namely, plagiarism, referencing materials and using online databases. Subsequently, this was extended to include evaluating credible sources, citation generators, formatting of papers, writing a literature review, using AI tools and further facilitating other areas of interest which were requested by patrons. Additionally, library professionals began to offer group and one-on-one sessions with patrons providing guidance on research topics, formatting and referencing research papers and editorial works, among others. The delivering of IL consultation services was done by the traditional modes, however, during the COVID-19 pandemic and with the advancement of technology, these were made popular via the virtual modes.

UGBCL in Brief

The UGBCL was established in 2000; it is a branch of the main University Library at Turkeyen. It supports the instructional, information and research needs of the academic community as well as provides a variety of resources to extend the teaching and research programmes of the University of Guyana [2]. It comprised two divisions: Technical Services Division (TSD) and Reader Services Division (RSD) with a total of nine (9) staff, all of whom work across the two divisions. The TSD is mainly responsible for the following tasks:

1. Processing materials including accessioning, cataloguing and verifying
2. Managing the Bindery Unit
3. Storing equipment
4. Overseeing photography & videography projects
5. Handling stock requisitions

The RSD establishes direct contact with patrons since they make the materials processed in TSD available to patrons. Currently, it is mainly responsible for the:

Circulation Desk which entails:

1. Checking in and out of materials
2. Renewals
3. Printing, Photocopying & Scanning
4. Equipment Loans
5. Miscellaneous Loans

Information Desk which entails:

1. Register patrons
2. Clear patrons
3. Provide access to databases
4. Respond to basic/routine queries
5. Process interlibrary loan requests
6. Provide Social Networking Services

Reading Room which entails access to a user friendly and conducive study space.

From the layout above it is evident that while no divisions at UGBCL were assigned the task of providing academic support in the form of research consultations, conducting IL sessions, engaging in advanced reference services, among others, in an effort to meet patrons' information and research needs, all staff assisted in whatever way possible. Furthermore, with the increase of requests driven by referrals and UGBCL marketing strategies, this internal growth of stakeholders, and interest from the external stakeholders such as the secondary schools and Cyril Potter College of Education (CPCE), shows that there is a desperate need for a RRSD. Also, at some juncture patrons were sometimes refused this service due to time constraint, staff unavailability, among others. So, while UGBCL is committed to providing academic support to its patrons, there is an opportunity to enhance this support by establishing a RRSD.

The need for this division is driven by the recognition that patrons require more personalised and in-depth support to navigate the challenges encountered in academic research and information literacy. As such, UGBCL can bridge the existing gaps and enhance academic support by establishing a division focusing on research and reference services.

This study highlighted the need for a RRSD at UGBCL to provide high-quality academic support by assessing the current services and identifying areas for enhancement; developing

a robust framework for the division; and evaluating the feasibility of establishing the same.

Rationale/Purpose of the Study

The purpose of the study was to investigate the current academic support services UGBCL offered to meet patrons' needs and further to determine whether there is a need for the establishment of a division within UGBCL to offer the same. The reason for this is due to the absence of a specific division to provide this service at UGBCL and the dependency on staff initiative to assist patrons. However, they cannot always fulfil these requests due to lack of staff, the expertise, and the receipt of requests beyond working hours. Additionally, staff eventually became overwhelmed with the additional amount of work they performed.

Problem Statement

UGBCL receives overwhelming requests from patrons for assistance, most of which are often outside of the normal working hours. While UGBCL does not have a designated division to provide academic support including research consultations, advance reference services, IL sessions, among others, it does its best to meet the evolving needs of its patrons by assisting where necessary. Nevertheless, with the increased requests and continuous need for this service on a wider scale, this study proposed the need for a RRSD within UGBCL.

Research Questions

The research questions that guided this study were as follows:

1. How can academic support at the University of Guyana Berbice Campus (UGBC) be enhanced within the Library?
2. What are the critical components required for establishing the RRSD within UGBCL?
3. What are the possible challenges that should be considered before establishing the RRSD and how should they be effectively addressed?

Hypotheses

The following hypotheses (null and alternative) were put forward to support the first research question:

1. Null Hypothesis (Ho): There is no significant difference between the categories of respondents and their responses regarding the establishment of the RRSD.
2. Alternative Hypothesis (H1): There is a significant difference between the categories of respondents and their responses regarding the establishment of the RRSD.

Research Objectives

General Objective

The general objective of this study was *to establish a RRSD within the library at the UGBC to provide academic support to patrons*.

Specific Objectives

The specific objectives of this study were as follows:

1. To examine the current academic support provided by the UGBCL and further to determine whether there is a need for a RRSD to enhance these services.
2. To develop a robust framework for the RRSD focusing on its goals, service offerings, structure, staffing, infrastructure and budget.
3. To assess the feasibility of establishing the RRSD within the UGBCL by identifying potential challenges and proposing viable solutions for successful implementation and sustainability.

Significance of the Study

The significance of the study was as follows:

1. Emphasised the need for a RRSD within the library to enhance academic support at UGBC.
2. Served as a guide to the University, in particular the staff at UGBCL in terms of

developing and implementing a robust framework for the proposed new division.

3. Provided a listing of the possible challenges to be considered before establishing the RRSD along with the solutions to the same.

Limitations of the Study

The limitations of this study were as follows:

1. There was no guarantee that every questionnaire sent out will be returned and in a timely manner.
2. There was a possibility that respondents' bias may be evident where they might withhold their true opinions on certain questions.

Literature Review

Evolving Role of University Libraries

University libraries are considered essential components of their parent institutions, providing resources and services to support teaching, learning and research. However, over the years, the role of libraries is continuously changing, and this is due to the increasing amount of information readily available via the internet as well as the use of information and communication technologies [3]. The changes in roles are thus necessary and libraries must adapt if they are to meet the diverse needs of their patrons.

Academic Support Provided by University Libraries

Academic support, referred to as an intervention to help learners/students/scholars to be successful in their academic endeavours, has become an essential and necessary service in libraries [4]. The academic support provided by university libraries to their patrons globally are similar in nature as evident in some examples below.

The University of Edinburgh Library provided academic support in the form of IL and library skill sessions; one-on-one librarian consultations; develop digital library skills, dissertation and thesis festival; research cafe; royal literary fund fellow; and resources and guidance [5]. At the Sir Alex Ferguson Library, they offer academic support such as one-on-one support as well as embedding and teaching library classes/sessions and workshops into programmes so as to get students to use quality academic resources [6]. Further, Ontario Institute for Studies in Education (OISE) Library offered drop-in research support to assist patrons with the basics such as resources, research tools, literature reviews, among others, as well as one-on-one and small group consultations for more advanced research assistance which includes formulating a literature search strategy [7].

From the Atlantic Cape Community College Library, they provided tutoring services in nearly all subject areas to all students using various modes like in-person, live chat, interactive whiteboards, live meetings, and asynchronous [8]. Additionally, the UWI Library support services include library instruction, research consultations, reference services, bibliographies and references, web-based guides, thesis consultation/checking, ask a librarian, among others [9].

Common Academic Support Services

Literature revealed that the following academic support services are considered common/popular in university libraries; these are briefly discussed below.

1. IL and Library Sessions

IL and library sessions focus mainly on patrons' information literacy needs, they are designed on specific research aspects or overview of library resources [10].

2. Research Consultations

Research consultations are designed to help patrons in academic writing, develop search strategies, using reference management software, providing knowledge of library resources, among others [5]. Additionally, it includes assistance in organising research and

providing customised support for patrons' research needs [11].

3. Library Course/Classes

Courses taught by library professionals are incorporated into students' programmes at universities. Library classes are taught during the semester pertaining to search strategies, library research, evaluation of sources, critical thinking, citations, among others [12].

4. Reference Services

Reference services usually take the form of providing assistance in finding materials, answering queries, accessing information, among others [13].

5. Thesis Checking/Scrutiny

Thesis checking/scrutiny involves checking students' thesis to ensure that they comply with the guide provided by the faculty/university as it relates to formatting, abstract, references, among others; then certifying it as acceptable for the library's collection providing it meets the requirements [9].

Impact of Academic Support Provided by University Libraries

Literature revealed that academic support in the form of library instruction sessions, etc. plays a critical role in students' success [14, 15]. Additionally, IL helps students to effectively identify and use information, engage in critical thinking and ethical reasoning, thus, contributing to their academic success [16]. Moreover, evidence revealed that library instruction courses enhance the persistence, grades and the overall academic achievement of students [17]. Further, students who took the library course, received a higher GPA when compared to those who did not take it [18]. As such, it can be said that library courses/instructions are considered one of the factors that contributes to students' success. Further, students reported that research consultations provided by the library met their expectations since it equipped them with the skills to undertake their projects and simultaneously enhanced the quality of their work significantly [19]. Finally, students noted that they developed a higher level of confidence as it pertains to their research abilities following a consultation with the library [20].

Gaps in Academic Support

While university libraries provide academic services, there are gaps which include patrons being unaware of the support, limited staff, expertise shortage, and infrastructure.

Reports and surveys indicated that students are unaware of the library's support services including the research assistance available to them [21]. Additionally, in a survey conducted, in terms of user awareness of the library services and IL sessions, the library needs to intensely promote them [22]. Further, student support divisions because they require specialised knowledge, they are unable to implement some of the programs [23].

Establishing a Division for Academic Support

Before establishing any division, it is essential to obtain stakeholder buy-in which can be done through various methods such as engaging students, faculty, and administrative staff in the planning process. Obtaining buy-in from stakeholders is critical to ensure the right fit [24].

In establishing a new department, it is important to identify the problem that the department will be solving, engage in documentation such as setting objectives, preparing operational templates, etc., set the culture, and engage in recruitment [25].

Overall, literature revealed that establishing a division requires setting clear objectives, defining service offerings, creating an organisational structure, recruiting staff, allocating resources, engaging in budgeting, among others.

Materials and Methods

Overview

This section of the paper focuses on how the study was designed in order to gather the data required to address the research questions posed. Research methodology entails a researcher designing a study systematically to ensure the results are valid and reliable in addressing the research aims and objectives [26]. This section includes the research design; study area; population and sample; study duration; data collection and analysis; and ethical considerations.

Research Design & Approach

Research design is defined as the methods and techniques that a researcher uses to integrate aspects of research in a logical way so that the research problem is dealt with efficiently [27]. It is basically the researcher's plan to answer the research questions. For this study the quantitative research design was used because it aims to answer questions like what, how, where, who and when throughout the study and at the same time it was easier to utilise visuals like charts, graphs, etc. to represent the outcome of the analysis [28].

The study was carried out using both survey research and content analysis. The survey research is also referred to as descriptive research. Descriptive research entails using instruments like interviews and questionnaires to obtain information from individuals [29]. As such, Google form, a web-based survey tool was used to collect data. This instrument was easy to use and allowed the researcher to collect both quantitative and qualitative data from a large number of respondents in a shorter time frame. It must be noted that the data collection process was conducted online since the respondents were rarely on campus during this period. While the respondents were treated with utmost confidentiality, there was a possibility that they may have withheld their true opinions on certain questions.

The content analysis is referred to as a document analysis. Content analysis as a research tool which is used to find certain words or concepts within documents which is then analysed and inferences drawn to the study undertaken [30]. This data collection type was employed because secondary data can be retrieved at a convenient time and has proven to be an unobtrusive source of information. Also, as written evidence, it is cost effective and efficient since it reduces the time needed for transcribing as is done with other types of data collection. However, one of the disadvantages of this data collection type is that protected information is not available to public or private access [31].

Study Area

Selecting a research area is essential because it decides whether the information obtained will be useful or not [32]. This study was conducted at the UGBC located at Tain, Port Mourant, Corentyne Berbice, Region # 6 (see figure 1 below). The reason for selecting this area was that the researcher is employed at this Campus and as such can have access to the necessary resources for this study. Also, over the 11 years of experience at the UGBCL, the researcher recognised that there is a need for a separate division at the library to provide academic support services to patrons.

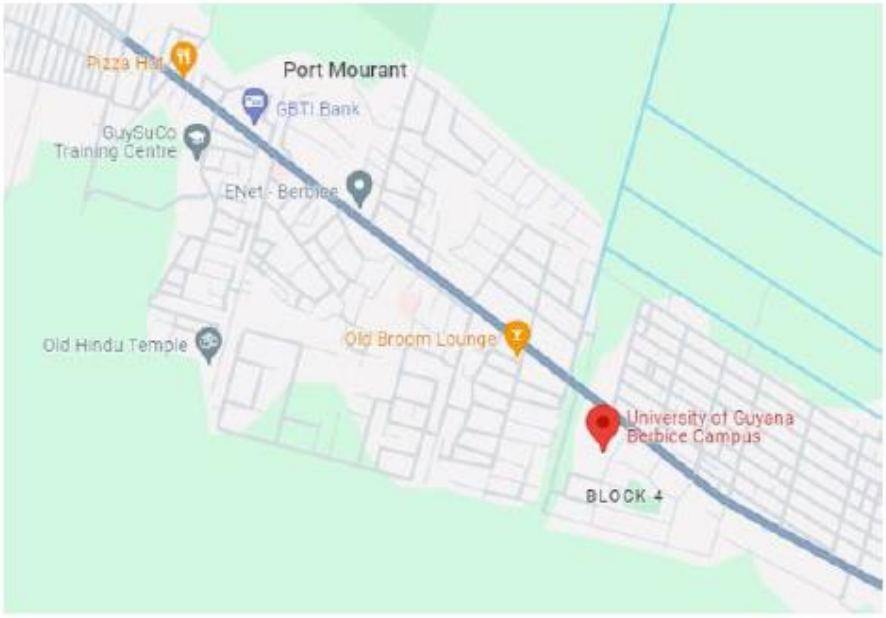

Figure 1. Map showing the geographical location of the study area. Source: Google Map.

Study Population

Population is defined as all the members of a class whether it be people, objects or events [29]. It is also defined as a group of persons with similar characteristics [33]. The population for this study was the undergraduate students and academic staff of Berbice Campus which was approximately six hundred (600) and forty (40) respectively. It also included the staff at the UGBCL, a total of nine (9). As such, the study sample was derived from this population.

Sampling Method

Sample is defined as a subgroup of the population that a researcher aims to study in order to generalise the population [33]. The researcher utilised the purposive sampling, a non-probability technique, to select the sample for this study. Purposive sampling or judgement sampling involves judging samples that are representative of the population [29]. So, this sampling technique relies on the discretion of the researcher to identify/select individuals and documents to provide valuable information to achieve the objectives of the study. The purposive sampling technique was chosen for this study because it was considered both cost and time effective. Simultaneously, documents and participants were selected based on their ability to provide more valuable insights into the study as against random selections.

As such, the criteria for selecting the participants were as follows:

1. Students across all division/college/school at UGBC at different study years who used the academic support services.
2. Academic staff that utilised the academic support services for the benefits of their students.
3. UGBCL staff since they are directly involved in the provision of the academic support services.

While the criteria for selecting similar research/documents were as follows:

1. Terms based on the topic understudy
2. Title and abstracts
3. Year of publication, that is between 2000-2024
4. Peer-reviewed, full-text, etc.

Sample Size

A sample size of 74, comprising forty-five (45) students, twenty (20) academic staff and nine (9) library staff were selected for this study (see table 1 below).

Table 1. Sample of the study

Participants	**Population**	**Sample**
Undergraduate Students	600	45
Academic Staff	40	20
Library Staff	9	9
Total	**649**	**74**

Additionally, over 30 relevant documents were perused so as to answer the research questions.

Study Duration

The study duration was a six (6) months period, that is, during April - September, 2024.

Collection of Data

Survey Research

Permission was sought from the Director (ag) of UGBC to conduct the survey with the students and staff of UGBC. After approval was obtained, the questionnaires were then created using Google forms and vetted by experts in the research field as part of the validation process. A pilot study was then conducted with approximately five (5) students and five (5) staff who were not included in the actual study in order to validate the accuracy and suitability of the instrument and at the same provide the researcher with the opportunity to make adjustments to the questionnaires where necessary. So, with the questionnaires created, validated and tested for reliability, the data collection process commenced where consent was sought and questionnaires with a brief note of the purpose of the study were sent via email and WhatsApp to the students, academic staff and the library staff selected. The data collected from the survey was automatically stored on the cloud after the questionnaires were filled. This process was conducted during the period June-July, 2024.

Content Analysis

A number of institutional documents including monthly reports, statistics sheets, UGBC proposed organogram, among others were retrieved and reviewed. Additionally, various websites and databases like EBSCOhost, JSTOR, etc. were utilised to search for articles pertaining to the topic understudy. Various search terms were used including *academic support services provided by university libraries*, *impact of library academic services on students*, *library reference services division impact*, *research and reference services in academic libraries*, among others. The search results were then filtered in terms of publication year, subject, peer-reviewed and full-text. Also, the title and abstract of articles were used as a guide to select the most appropriate ones. As a result, over 30 publications including books, articles, websites, among others were retrieved and reviewed.

Table 2 below provided basic details about the documents retrieved and reviewed during the study. These documents were critical in terms of providing answers to the research questions in addition to the primary data gathered. As such, the information was analysed and utilised accordingly within the study. Overall, the information was presented under the relevant headings in a clear and comprehensive manner.

Table 2. Documents retrieved and reviewed

Type of Documents	Description of Documents	Source of Documents
University records	• Monthly reports • Statistics sheets • Organogram • Time analysis worksheets • Student guide	UGBCL
Literature on libraries academic support services	• Articles • Chapters	Journals, Books, Websites

Data Analysis

Credibility is critical when analysing data in a study. In this process it is important to organise, code and represent data so that it can be interpreted accurately [34]. As such, data analysis was done in a credible process so as to establish trustworthiness in the research. Data analysis was done using the SPSS software version 23 and Microsoft Excel 2016. The data collected from Google forms was coded and inputted into SPSS then analysed using descriptive statistics (frequency, percentages and cross tabs including Chi-Square test) and multiple responses. It is important to note that since there were three (3) categories of respondents, 3 sets of data were coded and analysed into SPSS. The analysis generated from SPSS were then copied and merged into Microsoft Excel to produce the necessary tables, graphs and charts.

Ethical Considerations

Since this study involved human respondents, it was critical that human research ethics be obtained [35]. As such, permission was sought from the Director (ag) of UGBC to conduct the survey. Additionally, before obtaining data from the participants, they were informed who the researcher was, the purpose of the research, the data that would be collected and how the data would be used; this was followed by seeking their consent. Further, participants' identity was kept anonymous since they were not required to supply their names.

Results

Introduction

This study was conducted at the UGBC to determine if there is a need for a RRSD within the library to enhance the academic support provided to patrons. Questionnaires were utilised to obtain data from 74 respondents who are the students, academic staff and library staff. It must be noted that while 74 was the proposed sample amount, more than 74 questionnaires were sent out since there is the possibility that not all will be returned. However, the amount returned matches the proposed sample amount. The data collected was analysed using a combination of SPSS version 23 and Microsoft Excel 2016. The results and analysis were presented using descriptive statistics which were displayed through tables, graphs and charts where the biodata is cross tabulated and the 3 research questions were done in frequency, percentage and cross tabulations including a Chi-Square test.

Findings & Analysis

Analysis of Demographic Characteristics

Students

Figure 2 below display the demographic characteristics of the forty-five (45) students at the UGBC who participated in the survey. It can

be seen that majority of the students were from Natural Science (24.4%), between the age range 26-30 (35.6%) and in final year (44.4%). Overall, it can be seen that students within all the college, divisions and school as well as the year of study and age range were represented.

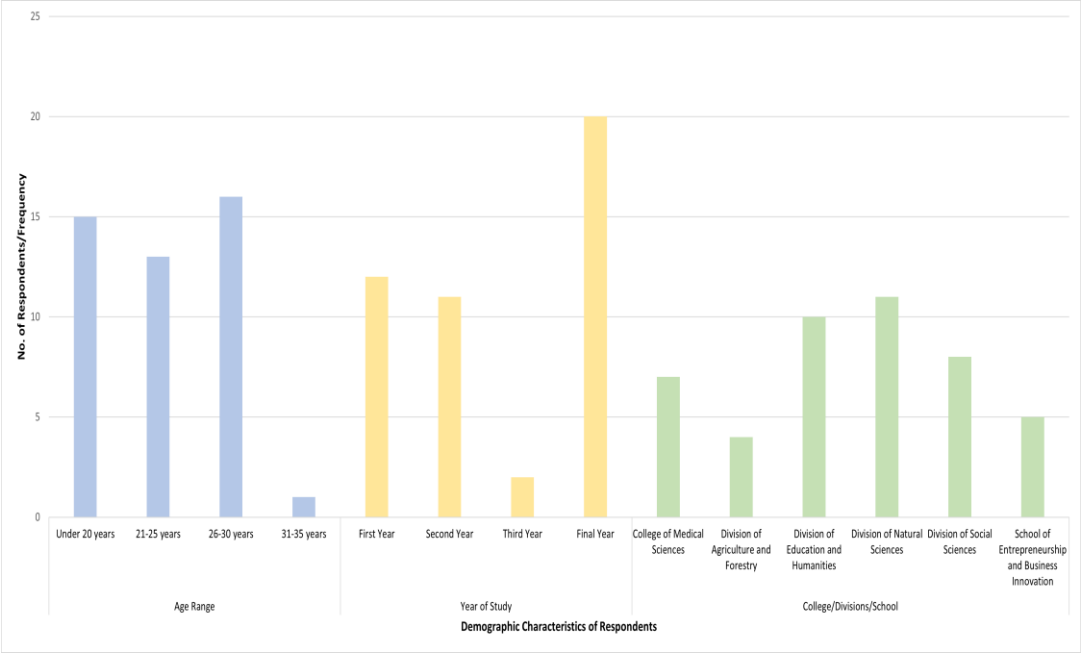

Figure 2. Demographic characteristics of students

Academic Staff

Figure 3 below display the demographic characteristics of the twenty (20) academic staff who are the lecturers at the UGBC that participated in the survey. It can be seen that majority of the staff was from the Division of Education & Humanities (40%), over 36 years (75%) and over 15 years of experience (50%). Overall, it can be seen that academic staff within all college, divisions and school as well as age range and experiences were represented.

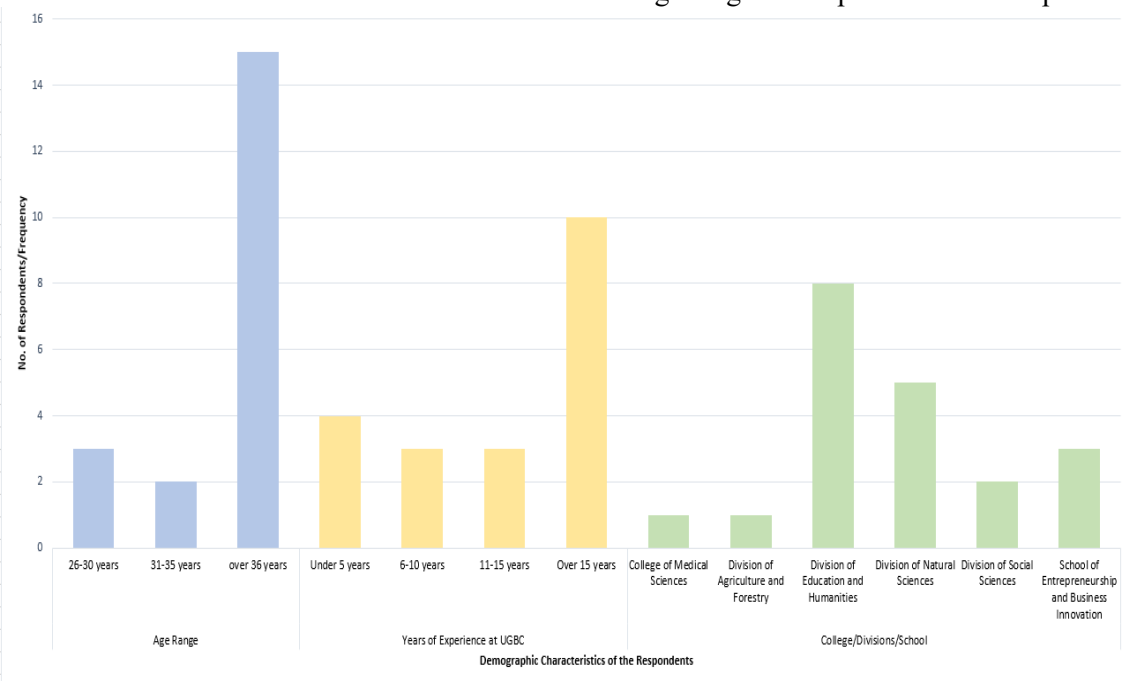

Figure 3. Demographic characteristics of academic staff

BCL Staff

Figure 4 below display the demographic characteristics of the nine (9) staff at UGBCL. It can be seen that majority of the staff was junior (66.7%), over 36 years (44.46%) and under 5 years and 6-10 years' experience (33.3%) each. Overall, both categories of staff as well as all designation, age range and years of experience were represented.

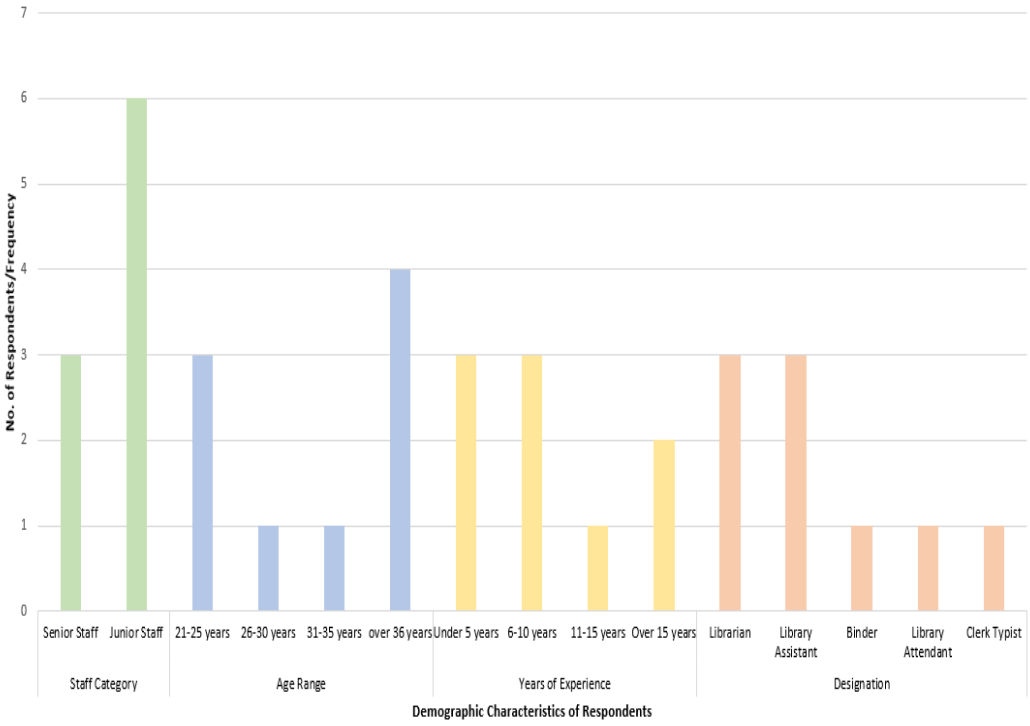

Figure 4. Demographic characteristics of UGBCL staff

Research Question 1: How can academic support at the UGBC be enhanced within the Library?

This research question entailed finding out what are the academic support services utilised, how often they are being utilised, which services need enhancement, the challenges patrons experienced accessing the services, whether there is a need for a RRSD and if patrons are in support of the establishment of the same.

Table 3 below displays the academic support services utilised by patrons, that is, both students and academic staff in the various college, divisions and school. Overall, the most popular academic support service used by the students was the use of research tools (55.56%) while for the academic staff it was citation & referencing (75%). Nevertheless, upon consulting with the UGBCL monthly reports and statistics sheets for the academic year 2023/2024, it can be seen that 19 IL class sessions were done in areas such as plagiarism, citation & referencing, turnitin, database usage, formatting of papers, finding academic sources, formulating literature review and abstracts, annotated bibliography, among others. For the class sessions, plagiarism and citation & referencing were the most common ones. Additionally, 177 group and one-on-one sessions were done with patrons in areas like citation & referencing, formatting of papers, fulfilling article requests, guidance on research topics, proofreading & editorial works, using SPSS (installing, coding, inputting and analysing data), using Microsoft applications, Google workspaces, LibreOffice, and assisting with UG application and registration processes. For the group and one-on-one sessions, citation & referencing, formatting of papers and using the SPSS were the most common ones.

Table 3. Academic support services utilised by patrons

Academic Support Services	College/Division/School												Total	
	College of Medical Sciences		Division of Agriculture and Forestry		Division of Education and Humanities		Division of Natural Sciences		Division of Social Sciences		School of Entrepreneurship and Business Innovation			
	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu.	Aca. Staff
Information Literacy Sessions (One-on-One)	3	0	0	1	2	0	2	0	1	1	0	0	8	2
Information Literacy Sessions (Group)	3	0	0	1	1	1	2	1	3	1	0	0	9	4
Guidance on Research Topics	2	0	1	1	6	4	6	3	2	0	2	1	19	9
Formatting of Papers	2	0	0	0	2	4	3	1	3	2	1	1	11	8
Assistance with Citations and Referencing	3	1	4	1	5	7	6	3	3	2	0	1	21	15
Editorial Works and Proofreading	2	0	1	0	2	1	3	0	2	1	1	1	11	3
Use of Research Tools	6	0	1	1	4	4	8	3	5	1	1	2	25	11
Advance Reference Queries	3	0	1	0	1	2	4	2	2	1	0	0	11	5
Provision of Additional Resources	2	1	0	0	5	7	7	3	2	1	2	1	18	13
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**45**	**20**

Table 4 below shows the frequency of usage of the academic support services by both the students and academic staff. 4 (8.9%) students and 1 (5%) academic staff always used the academic support services, 15 (33.3%) students and 5 (25%) academic staff often used the academic support services, 11 (24.4%) students and 13 (65%) academic staff sometimes used the academic support services and 15 (33.3%) student and 1 (5%) academic staff rarely used the academic support services. It is important to note that no students or academic staff indicated that they never used the academic support services provided by the library. As such, to further support this, consultation with the library's monthly reports and statistics sheets

revealed that the students and academic staff utilise the academic services on a regular basis.

Table 4. Frequency of usage of academic support services

Responses	**Students**		**Academic Staff**	
	Frequency	**Percent**	**Frequency**	**Percent**
Always	4	8.9	1	5.0
Often	15	33.3	5	25.0
Sometimes	11	24.4	13	65.0
Rarely	15	33.3	1	5.0
Total	**45**	**100.0**	**20**	**100.0**

Table 5 below shows only the requests that were received and fulfilled/honoured. So, while there was no statistics to show the total amount of requests received, staff members indicated that quite a lot of requests were refused due to staff unavailability and the beyond working hours' requests. Another critical point is that this is not an offering at UGBCL, but it is accommodated due to patrons' needs. Also, it can be seen in the table below that no class sessions were consecutively done during June – August because it was the summer period.

Table 5. Monthly statistics of patrons' usage of academic services at UGBCL in 2023/2024

Months	**No. of Class Sessions**	**No. of One-on-One & Group Sessions**
September 2023	3	15
October 2023	6	8
November 2023	1	16
December 2023	1	30
January 2024	0	8
February 2024	4	10
March 2024	3	20
April 2024	0	20
May 2024	1	10
June 2024	0	15
July 2024	0	15
August 2024	0	10
Total	**19**	**177**

Table 6 below displays the academic support services that patrons in the various college, divisions and school felt need enhancement. Overall, the services that need the most enhancement were provision of additional resources (33.33%) and editorial works & proofreading (70%) as indicated by students and academic staff respectively. Nevertheless, upon consulting the UGBCL IL sessions evaluation forms, in terms of enhancement,

patrons highlighted that practical aspects should be incorporated into the sessions e.g. in the demonstration of paper formatting, students should be given the opportunity to do the same. They also added that videos can be made on these areas for students and academic staff to access. While others commented the following: "services are top-class", "sessions are very helpful", "learn't a lot", "continue to conduct more sessions", among others.

Table 6. Academic support services patrons felt need enhancement

Academic Support Services	**College/Division/School**												**Total**	
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**
Information Literacy Sessions (One-on-One)	2	0	0	0	3	2	2	3	1	0	1	1	9	6
Information Literacy Sessions (Group)	3	0	0	0	1	1	1	1	2	0	1	1	8	3
Guidance on Research Topics	3	1	1	0	1	3	4	1	4	2	1	2	14	9
Formatting of Papers	0	0	0	1	3	3	4	2	3	0	0	1	10	7
Assistance with Citations and Referencing	2	1	2	0	2	3	4	2	2	0	1	1	13	7
Editorial Works and Proofreading	1	1	1	1	2	7	5	1	4	1	1	3	14	14
Use of Research Tools	2	1	1	0	3	4	4	1	2	0	0	3	12	9
Advance Reference Queries	3	1	1	1	2	5	4	1	2	0	2	3	14	11
Provision of Additional Resources	2	1	1	0	2	3	4	0	4	0	2	2	15	6
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**4**	**3**	**45**	**20**

Table 7 below reflects the challenges patrons (students and academic staff) encountered when accessing the academic support services and the challenges the library staff encountered in providing these services. Overall, the most prominent challenges encountered were limited access to expert guidance, beyond working hours (55%), and lack of staff availability (66.67%) as indicated by students, academic staff and library staff respectively. In addition to lack of staff availability, upon consulting with the library staff time analysis worksheets it was revealed that on numerous occasions staff worked beyond working hours including holidays to accommodate IL sessions both class sessions as well as group and one-on-one.

Table 7. Challenges encountered when accessing/providing academic support services

Academic Support Services	**College/Division/School**													**Total**		
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**		**UGBCL**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**		**Stu**	**Aca. Staff**	**UGBCL**
Limited Staff Availability	4	0	0	0	3	2	3	2	3	1	3	1	6	16	6	6
Limited Access to Expert Guidance	3	1	1	0	8	0	8	1	6	2	1	3	4	27	7	4
Beyond Working Hours	5	0	3	0	4	7	3	2	3	1	3	1	4	21	11	4
Lack of Infrastructure	2	0	1	0	3	1	3	1	3	0	1	2	5	13	4	5
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Figure 5 below displays whether there is a need for a RRSD within the library to provide academic support services. Overall, a minority of the respondents 3 (4.1%) recognised that there is no need for the establishment of a RRSD while majority of the respondents 71 (95.9%) recognised there is a need for the establishment of a RRSD. Also, upon looking at the UGBCL proposed progressive organogram, the staff recognised that there is a need for such a division since it proposed the establishment of a division with the same function but with a slightly different name *Digital & Reference Services Division*. It must be noted that this division is referred to by different names such as *Research Division*, *Reference Services Division*, *Reference and Information Services Division*, among others but basically perform the same function. It's important to note that while this division was initially proposed for the institution, a survey was not done to indicate its necessity rather it's been done based on observation and requests received. Hence, this current study sought to support the initial idea of establishing the same.

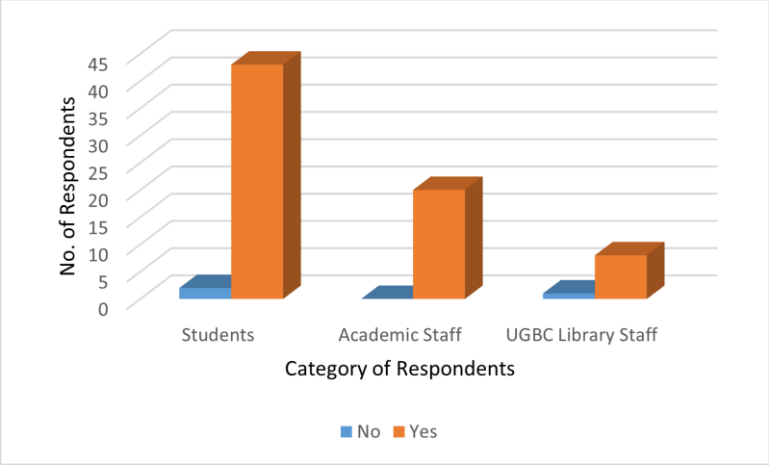

Figure 5. Need for the establishment of a RRSD within the library

Hypothesis Testing

Null Hypothesis (Ho): There is no significant difference between the categories of respondents and their responses regarding the establishment of the RRSD.

Alternative Hypothesis (H1): There is a significant difference between the categories of respondents and their responses regarding the establishment of the RRSD.

Table 8 below shows that a Chi-Square test was done to evaluate whether there was a significant association between the categories of respondents (students, academic staff and library staff) and their responses regarding the establishment of the RRSD (as shown in Figure 5). It can be seen that the Chi-Square value is 2.015 which measures the extent of deviation between the observed and expected frequencies, degree of freedom is 2 and the p-value is 0.365. The p-value of 0.365 which is less than the commonly used significance level 0.05 simply means that there was no significant difference between the students, academic staff and library staff as it relates to their agreement or disagreement with the establishment of the RRSD. Thus, the null hypothesis is accepted. So, this lack of significant differences across the three categories suggested consensus in the sense that the proposal to establish the RRSD may be widely supported or opposed uniformly. Nevertheless, this table revealed broad-based support which is critical in moving forward with the establishment of the RRSD. Also, the lack of significant differences revealed that there is no need to target specific groups for support as well as focus can be made on identifying common challenges among the groups rather than specific ones, thus leading to efficiency in problem solving.

Table 8. Chi-Square test on the responses regarding the establishment of the RRSD for different categories of respondents

	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	2.015a	2	.365
N of Valid Cases	74		

Figure 6 below displays the supportiveness of the students, academic staff and library staff in establishing a RRSD at the UGBCL. Overall, 42 (56.8%) respondents who were the majority were strongly supportive of establishing the RRSD while 32 (43.2%) respondents were supportive of it. It's important to note that no students, academic staff or library staff

indicated that they were not very supportive or not supportive at all in establishing the RRSD, hence emphasising the necessity for the division. Another critical point is that while 3 respondents indicated that they do not see the need to establish a RRSD in Figure 5, they were supportive of establishing the same.

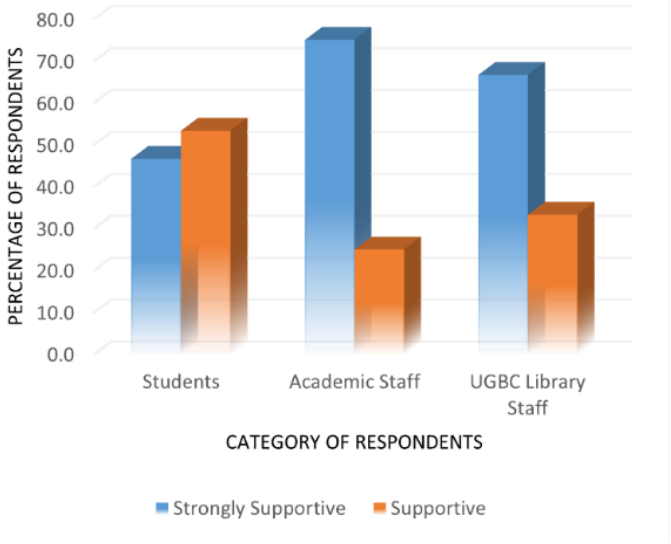

Figure 6. Supportiveness of establishing a RRSD

Research Question 2: What are the critical components required for establishing the RRSD within UGBCL?

This research question entailed identifying the critical components required for establishing the RRSD including service offerings, structure, staffing, infrastructure and budget.

Service Offerings

Table 9 below displays the services that RRSD can offer to its patrons that the students, academic staff and library staff agreed on. Overall, the students indicated the need for access to specialised resources (68.9%) as the main service, the academic staff indicated strengthen research skills (90%) and the library staff indicated access to specialised resources (100%), IL sessions (100%), support for academic writing/formatting/ referencing (100%), editorial works & proofreading (100%), strengthen research skills (100%) and use search techniques (100%). This is further supported by the library monthly reports and statistics sheets where all these services are provided to patrons through class sessions as well as group & one-one-one sessions.

Table 9. Services that the RRSD can provide to patrons

Academic Support Services	**College/Division/School**													**Total**		
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**		**UGBCL**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**		**Stu**	**Aca. Staff**	**UGBCL**
Access to Specialised Resources	7	1	2	1	5	7	8	5	6	1	3	2	9	31	17	9

Information Literacy Sessions	3	0	0	1	4	4	5	3	2	2	2	1	9	16	11	9
Workshops and Seminars	4	1	2	1	5	6	5	2	3	1	1	2	6	20	13	6
Library Course(s)	2	0	0	1	3	3	5	1	3	1	1	1	5	14	7	5
Personalised Consultations	3	0	0	1	3	5	5	1	2	2	1	2	3	14	11	3
Support for Academic Writing/Formatting/ Referencing	5	1	2	1	5	6	8	3	4	2	2	3	9	26	16	9
Editorial Works & Proofreading	3	1	1	1	5	7	6	3	5	2	1	2	9	21	16	9
Reviewing of Research Papers	2	1	1	1	6	5	5	2	4	0	2	3	5	20	12	5
Use of Research Tools	4	1	3	1	6	7	8	3	5	2	4	2	7	30	16	7
Strengthen Research Skills	5	1	1	1	7	7	6	4	5	2	2	3	9	26	18	9
Utilise Search Techniques	2	1	0	1	5	3	5	1	2	2	1	2	9	15	10	9
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Figure 7 below reflects the opinions of the students, academic staff and library staff as to whether patrons should pay for certain specialised services including editorial works, proofreading and formatting of papers. Overall, 64 (86.49%) respondents, who were the majority, were in agreement that a fee be charged for specialised services offered while 10 (13.51%) respondents who were the minority were not in agreement. It's important to note that the library staff revealed that when students are in need of these specialised services they would usually offer to pay for the same. However, on numerous occasions due to various reasons including lack of staff availability and going beyond working hours, they were refused these services.

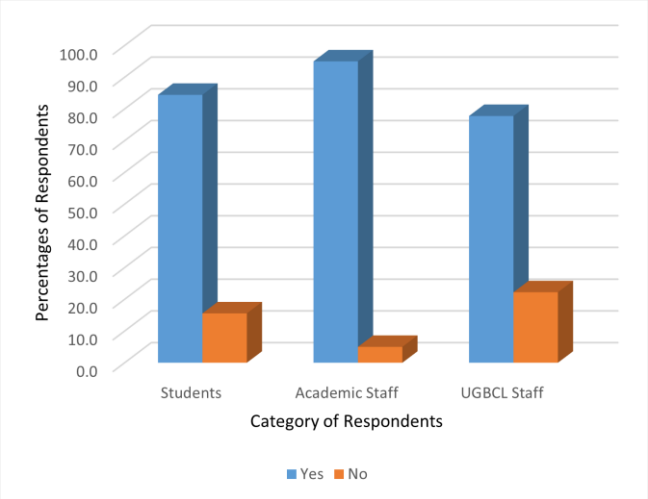

Figure 7. Paying for certain specialised services

Table 10 below outlines the topics that students, academic staff and library staff indicated that can be included in a library course if it is offered in the programmes at UGBC. Overall, the main topic based on the students' perspective was research skills (82.2%), for academic staff it was citation & referencing (100%) and for the library staff it was academic integrity & plagiarism awareness (88.89%), citation & referencing (88.89%), research skills (88.89%) and the use of research tools (88.89%).

Table 10. Topics to be included in the mandatory library course

Academic Support Services	**College/Division/School**													**Total**		
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**		**UGBCL**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**		**Stu**	**Aca. Staff**	**UGBCL**
Overview of Library Services	5	1	1	1	4	1	5	3	3	0	1	0	7	19	6	7
Database Usage	5	1	2	1	2	5	9	2	3	2	0	1	7	21	12	7
Academic Integrity & Plagiarism Awareness	3	1	2	1	9	7	8	4	5	2	2	3	8	29	18	8
Citation & Referencing	3	1	3	1	6	8	9	5	7	2	3	3	8	31	20	8
Information Literacy	3	1	0	1	5	2	5	3	3	2	2	2	6	18	11	6
Academic Writing	6	0	1	1	9	5	9	3	4	2	3	3	7	32	14	7
Research Skills	6	0	3	1	8	6	11	4	5	2	4	3	8	37	16	8
Use of Research Tools	6	1	2	1	5	6	5	4	4	2	2	3	8	24	17	8
Search Techniques	3	1	0	1	5	4	6	3	4	2	2	0	7	20	11	7
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Structure

Figure 8 below displays the mode of operations for the RRSD according to the perspective of the students, academic staff and library staff. In terms of the students, 4 (8.9%) indicated that the RRSD should be operated in the face-to-face mode, 6 (13.3%) indicated virtual and 35 (77.8%) indicated blended. In terms of the academic staff, 4 (20%) indicated face-to-face, 1 (5%) indicated virtual and 15 (75%) indicated blended. In terms of the library staff, 2 (22.2%) indicated face-to-face and 7

(77.8%) indicated blended. Overall, 10 (13.5%) respondents indicated face-to-face operations, 7 (9.5%) indicated virtual and 57 (77%) indicated blended.

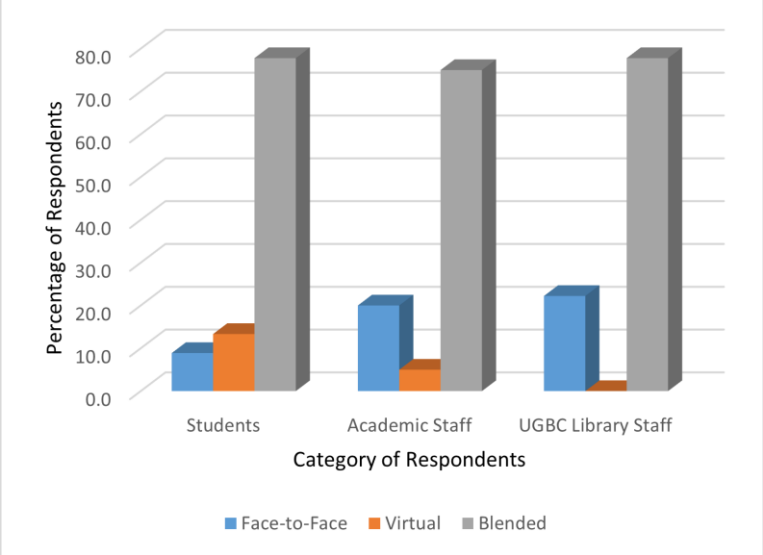

Figure 8. Mode of operations

Table 11 below displays the operation hours patrons including students and academic staff think will be most convenient for them to access the RRSD. Overall, the most popular option for students (55.56%) and academic staff (55%) was 24/7 access.

Table 11. Proposed operating hours for RRSD

Academic Support Services	**College/Division/School**												**Total**	
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**			
	Stu.	**Aca. Staff**	**Stu.**	**Aca. Staff**	**Stu.**	**Aca. Staff**	**Stu.**	**Aca. Staff**	**Stu.**	**Aca. Staff**	**Stu.**	**Aca. Staff**	**Stu.**	**Aca. Staff**
Mornings	2	0	2	1	1	0	2	0	1	0	1	0	9	1
Afternoons	1	1	1	1	3	2	0	2	4	2	3	1	12	9
Evenings	2	1	1	0	3	1	0	1	2	1	0	0	8	4
24/7 Access	3	1	1	0	4	6	9	2	6	0	2	2	25	11
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**45**	**20**

Figure 9 below presents the frequency in which patrons, that is, students and academic staff think they will use the academic support services provided by the RRSD. Overall, it is critical to note that the majority of the students (44.4%) and academic staff (50%) were of the view that they will be using the RRSD services on a weekly basis. This can be further supported by Table 5 where although there is no RRSD currently, patrons are still using the services on a regular basis. As such, with the division established with all the necessary resources, there will be an increase in requests and usage of these services.

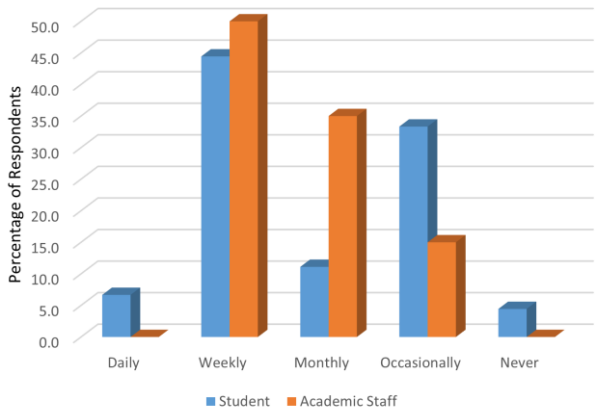

Figure 9. Frequency usage of RRSD

Figure 10 below presents views of library staff on the organisation structure for the RRSD. It can be seen that 4 (45%) library staff agreed on the hierarchical structure, 2 (22%) library staff agreed on flat and 3 (33%) library staff agreed on matrix. Hence, the majority of the library staff agreed on the hierarchical structure. Also, upon looking at the UGBCL proposed progressive organogram, it can be seen that the suggested structure for the proposed division was hierarchical.

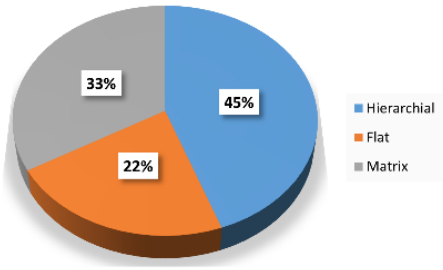

Figure 10. Structure for RRSD

Figure 11 below presents the library staff view on the RRSD integration into the existing library structure. It can be seen that 5 (56%) library staff indicated RRSD should be integrated into the existing library structure as a separate division and 4 (44%) library staff indicated as a sub-division in an existing division in UGBCL. Overall, the majority of the library staff indicated that RRSD should be a separate division within the library. This is supported by the proposed progressive organogram which placed the similar proposed division as a separate one.

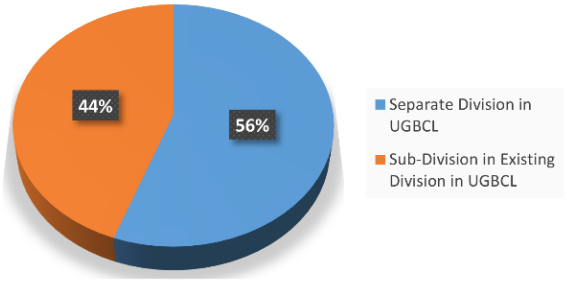

Figure 11. RRSD integration into the current UGBCL structure

Staffing

Figure 12 below presents the amount of staff necessary for the RRSD according to the library staff perspective. It can be seen that 5 (56%) library staff are of the view that 1-3 staff are needed and 4 (44%) library staff are of the view that 4-6 staff are needed. Hence, the majority of the staff agreed on having 1-3 staff for the division. This is supported by the proposed organogram where three (3) staff were suggested for the proposed division.

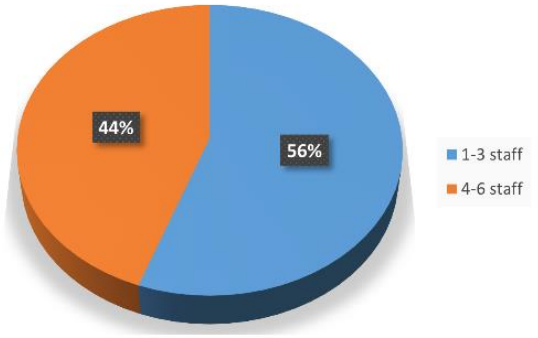

Figure 12. Amount of staff needed for the RRSD

Figure 13 below presents staff roles necessary for the RRSD. From the library staff perspective, it can be seen that the staff roles needed for RRSD are Research & Reference Services Librarian as indicated by all 9 (100%) library staff, Assistant Librarian as indicated by 4 of the 9 (44.4%) staff and a Digital Services Specialist as indicated by 8 of the 9 (88.9%) staff. So, while some library staff agreed on having 4-6 staff for the division in Figure 12, they did not list the other roles. However, these roles are similar to the ones suggested in the proposed progressive organogram.

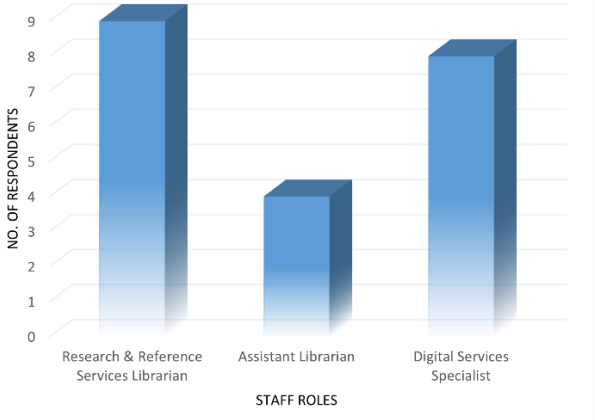

Figure 13. Staff roles

Table 12 below displays the tools that the staff in the RRSD should be proficient in to effectively enhance academic support according to the students, academic staff and library staff. It can be seen that the students, academic staff and library staff indicated that the staff of RRSD should be proficient in all of the tools namely data analysis, citation management, plagiarism checkers and collaborative tools. For the students (80%) and the library staff (100%), the most prominent one was plagiarism checkers while for the academic staff (95%) it was data analysis tools.

Table 12. Tools that RRSD staff should be proficient in

Academic Support Services	College/Division/School													Total		
	College of Medical Sciences		Division of Agriculture and Forestry		Division of Education and Humanities		Division of Natural Sciences		Division of Social Sciences		School of Entrepreneurship and Business Innovation		UGBCL			
	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff		Stu	Aca. Staff	UGBCL
Data Analysis Tools	6	1	3	1	8	7	8	5	7	2	3	3	7	35	19	7
Citation Management Tools	6	1	3	1	5	7	9	3	4	2	5	3	8	32	17	8
Plagiarism Checkers	6	1	3	1	7	6	10	4	6	2	4	3	9	36	17	9
Collaborative Tools	6	1	1	1	6	5	6	2	6	2	1	3	8	26	14	8
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Infrastructure

Table 13 below displays the infrastructure needed for the RRSD to function as indicated by the students (68.89%), academic staff (90%) and library staff (100%). Overall, for students and academic staff, the most prominent infrastructure was research tools/software while for library staff it was both computer workstations and research tools/software.

Table 13. Infrastructure necessary for RRSD to function

Academic Support Services	College/Division/School													Total		
	College of Medical Sciences		Division of Agriculture and Forestry		Division of Education and Humanities		Division of Natural Sciences		Division of Social Sciences		School of Entrepreneurship and Business Innovation		UGBCL			
	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff		Stu	Aca. Staff	UGBCL
Consultation Spaces	6	1	2	1	5	7	7	4	4	2	4	2	8	28	17	8
Zoom Room	6	1	3	1	5	6	6	2	5	2	3	3	7	28	15	7
Computer Workstations	7	1	2	1	6	5	7	4	4	0	2	3	9	28	14	9

Research Tools/Software	4	1	2	1	7	7	9	4	6	2	3	3	9	31	18	9
Databases	4	1	1	1	6	6	7	4	5	1	2	1	8	25	14	8
Chatbots	2	1	0	1	3	5	5	2	3	1	2	1	4	15	11	4
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Budgets

Figure 14 below displays the factors selected by the library staff that should be considered when engaging in budgeting for the RRSD. All of the 9 (100%) library staff selected both salaries & benefits and research & reference tools, 7 of the 9 (77.8%) library staff selected physical infrastructure, 8 of the 9 (88.9%) library staff selected training & professional development (PD) and 6 of the 9 (66.7%) selected marketing & outreach. Hence, it can be seen that most staff agreed on salaries & benefits and research & reference tools being the main factors.

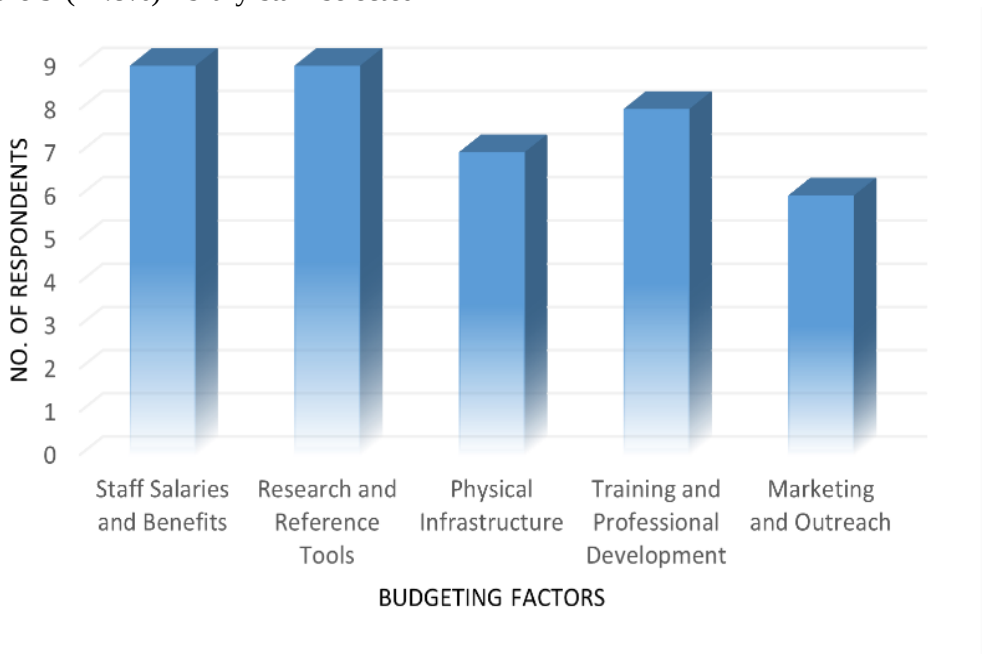

Figure 14. Budgeting factors

Research Question 3: What are the possible challenges that should be considered before establishing the RRSD and how should they be effectively addressed?

This research question entailed highlighting the possible challenges of establishing the RRSD along with their proposed solutions as well as outlining some sustainability measures that can be taken into consideration.

Table 14 below displays the potential challenges that should be considered before establishing the RRSD as indicated by the students, academic staff and library staff. Overall, the most prominent challenges selected by students (64.4%%) were limited operating hours and lack of qualified staff/experts, for the academic staff (80%) it was inadequate infrastructure and for the library staff (66.67%) it was inadequate infrastructure and lack of collaboration between academic divisions and the library.

Table 14. Potential challenges of establishing the RRSD

Academic Support Services	College/Division/School													Total		
	College of Medical Sciences		Division of Agriculture and Forestry		Division of Education and Humanities		Division of Natural Sciences		Division of Social Sciences		School of Entrepreneurship and Business Innovation		UGBCL			
	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff	Stu	Aca. Staff		Stu	Aca. Staff	UGBCL
Limited Operating Hours	4	1	3	1	7	5	7	3	7	1	1	1	3	29	12	3
Lack of Stakeholder Support	2	1	1	1	5	5	7	3	2	1	3	2	3	20	13	3
Inadequate Infrastructure	4	1	1	1	6	6	7	3	4	2	4	3	6	26	16	6
Lack of Qualified Staff/Experts	6	1	1	1	6	6	8	1	4	2	4	3	5	29	14	5
Accessibility Issues for Users with Disabilities and Diverse Needs	5	1	0	1	5	5	6	2	3	0	1	2	3	20	10	3
Lack of Awareness/ Limited Promotion of Services	6	1	4	1	6	6	6	3	5	2	1	2	3	28	15	3
Insufficient Resources/ Materials	4	1	1	1	8	5	6	4	4	1	2	3	5	25	15	5
Lack of Collaboration Between Academic Divisions and the Library	3	1	1	1	6	5	6	3	3	1	2	2	6	21	13	6
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Table 15 below displays the possible solutions to the potential challenges of establishing the RRSD as selected by the students, academic staff and library staff. Overall, the most prominent solution selected by the students (68.89%) was to recruit qualified staff/experts, for academic staff (85%) it was to upgrade existing infrastructure

and for the library staff (66.67%) it was to provide sufficient resources/materials and foster collaboration between academic divisions.

Table 15. Possible solutions to the potential challenges of establishing the RRSD

Academic Support Services	**College/Division/School**													**Total**		
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**		**UGBCL**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**		**Stu**	**Aca. Staff**	**UGBCL**
Extend Operating Hours	4	1	3	1	5	5	9	2	6	2	1	1	4	28	12	4
Engage Stakeholders Early	2	1	1	1	7	7	7	3	5	2	3	1	3	25	15	3
Upgrade Existing Infrastructure	4	1	1	1	7	7	5	3	4	2	5	3	5	26	17	5
Recruit Qualified Staff/Experts	6	1	2	1	8	5	7	1	4	2	4	3	4	31	13	4
Provide Assistive Technologies and Alternative Formats for Materials	5	0	1	1	6	6	7	4	5	1	3	3	4	27	15	4
Promote Awareness/Market Services	4	1	2	1	4	6	4	3	7	2	1	2	3	22	15	3
Provide Sufficient Resources/Materials	3	1	1	1	6	6	7	4	6	1	3	3	6	26	16	6
Foster Collaboration Between Academic Divisions and the Library	4	1	2	1	5	6	7	3	3	2	2	2	6	23	15	6
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Table 16 below presents the strategies/methods that the students, academic staff and library staff think should be adopted to ensure the sustainability of the RRSD. It can be seen that the 45 (100%) students, 20 (100%) academic staff and 9 (100%) library staff selected all of the strategies/methods namely: obtain regular feedback from patrons to improve services, engage in training & PD activities regularly and utilise updated technology & resources to sustain the RRSD. For the students and academic staff, the most prominent method was to engage in training and PD activities regularly while for the library staff it was the same as the student and academic staff in addition to obtain regular feedback from patrons to improve services.

Table 16. Strategies/Methods UGBCL should adopt to evaluate & sustain the RRSD

Academic Support Services	**College/Division/School**													**Total**		
	College of Medical Sciences		**Division of Agriculture and Forestry**		**Division of Education and Humanities**		**Division of Natural Sciences**		**Division of Social Sciences**		**School of Entrepreneurship and Business Innovation**		**UGBCL**			
	Stu	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**	**Stu**	**Aca. Staff**		**Stu**	**Aca. Staff**	**UGBCL**
Obtain Regular Feedback from Patrons to Improve Services	6	1	3	1	6	6	8	4	8	2	4	2	9	35	16	9
Engage in Training & Professional Development Activities Regularly	6	1	3	1	9	8	8	4	7	2	4	3	9	37	19	9
Utilise Updated Technology & Resources	7	1	3	1	6	7	9	4	6	2	3	3	8	34	18	8
Total	**7**	**1**	**4**	**1**	**10**	**8**	**11**	**5**	**8**	**2**	**5**	**3**	**9**	**45**	**20**	**9**

Discussion

The findings revealed that a RRSD should be established within UGBCL. As such the goals, service offerings, structure, staffing, budget and sustainability measures are discussed below.

Goals of RRSD

1. Enhance research support by providing comprehensive research assistance to patrons through consultation services.

2. Support academic writing by assisting with editing, proof-reading, formatting and citation guidance.
3. Foster collaboration with academic divisions to integrate research and reference services into the curriculum.
4. Improve IL by offering sessions, workshops, etc. on a regular basis to equip patrons with the necessary skills.
5. Expand digital services and resources by increasing availability and accessibility to databases, digital research tools and software to support academic work.
6. Sustain library infrastructure by continuously assessing and upgrading both the physical and digital infrastructure to meet patrons' needs.
7. Measure and enhance services by evaluating the effectiveness of the same on a regular basis and implement improvements based on patrons' feedback.

Service Offerings

Based on the survey as it relates to service offerings requested, service patrons used and felt need enhancement, the RRSD would offer the following services for starters then add new ones as the need arises.

1. Offering Advance Reference Services to assist patrons with identifying, accessing and utilising materials relevant to their research interests.
2. Hosting IL Sessions –class, group and/or one-on-one sessions in various areas. This can further be extended to workshops/seminars to facilitate knowledge dissemination.
3. Offering Research Consultations to provide patrons with guidance in writing papers, citations & referencing of materials, formatting of papers, editorial and proofreading works, among others.
4. Using Research Tools to provide guidance to patrons on using data analysis tools, citation management tools, collaborative tools, plagiarism checkers, among others.
5. Reviewing Research Papers to ensure patrons comply with the style manual selected by the Faculty/University before accepting the same in the collection.
6. Teaching a Library Course (1 credit) which all students of the university must take to orient them in finding and using information resources critically and effectively.

As such, the topics/contents for the proposed mandatory library course were crafted (see Table 17 below) following patterns from other libraries [36, 37] while the outline template was taken from the University of Guyana (UG).

Table 17. Proposed course outline for the mandatory library course using UG course outline template

Proposed Outline for Library Course	
Course Outline: LIB1105 – Introduction to the Use of Library Services	
Course Credit: 1	
Academic Year:	
a) Name of Lecturer:	**Office and Telephone:**
b) Course summary and mode of delivery: This course is designed to introduce students to library resources and services available to them. The course will equip students with the necessary research skills needed for their academic journey at the university. Students will learn to use the library's physical and digital collections, develop information literacy, understand citation practices, and explore various research tools. The course also covers strategies for locating, evaluating, and integrating scholarly materials into academic work. By the end of the course, students will have a strong foundation in using the library's resources to support their academic studies.	

The methods for teaching will include: Lectures, class discussions and practicals in a blended mode.

c) Reasons for introducing the course:

Equip students with the necessary research skills and tools to enhance their academic experience.

d) Are there similar courses in the faculty?

There are no similar programs in the faculty.

e) Co-requisites and Pre-requisites:

NIL

f) Learning Outcomes:

By the end of this course, the students should be able to:

- Possess strong research skills for academic success
- Be proficient in using library databases and digital research tools
- Be able to structure and write well-researched academic papers
- Understand ethical research practices and proper citation techniques
- Be prepared to conduct independent research for academic assignments

g) Contact Hours:

	Contact hrs. per wk.	**No. of Wks.**	**Mode of Delivery**
Lecturers	1	13	Blended

h) Methods of Evaluation/Assessment:

Course Evaluation	**Percentage Grade Component**
Course Work (Practicals)	40%
Final Examination	60%

i) Grading Scheme:

A - 75 – 100%
B - 65 to less than 75%
C - 55 to less than 65%
D - 45 to less than 55%
F - 0 to less than 45%

j) Content:

Week	**Content**
1	**Overview and Introduction to Library Services** • Reason to use the library • Membership & Registration • Resources and services available to students **Library Tour**
2-3	**Academic Databases and Effective Research Strategies** • Introduction to major academic databases (e.g. JSTOR, EBSCOhost) • Navigating databases and retrieving full-text articles • Identifying keywords and search strategies • Using of Boolean operators and advanced search techniques

	Practical: *Database search exercises*
4-5	**Information Literacy & Critically Evaluating Sources** • Identifying different types of information sources (books, journals, articles, etc.) • Understanding scholarly vs. non-scholarly sources • Critical evaluation of websites, articles, online resources, etc. • Identifying bias and ensuring credibility in research materials Practical: *Differentiating and evaluating sources*
6	**Academic Integrity & Plagiarism Awareness** • Understanding the concept of academic integrity • Recognising the different forms of plagiarism • Using research materials ethically Practical: *Utilising plagiarism checkers*
7	**Citation & Referencing** • Introducing the different citation styles (APA, MLA, etc.) • In-text citation & referencing rules –APA **Practical:** *Generating in-text citations & reference list within a research paper*
8-9	**Using Digital Tools -Bibliographic Management** • Introducing bibliographic management tools (e.g., Zotero, EndNote, Mendeley) • Collecting, organising and citing sources using bibliographic management tools Practical: *Installing and using bibliographic management tools*
10-11	**Using Digital Tools –Collaboration & Data Analysis** • Introducing collaboration and data analysis tools • Using of collaboration and data analysis tools Practical: *Using collaboration and data analysis tools*
12-13	**Academic Writing, Structuring & Formatting Research Papers** • Guidance on research topics • Building strong arguments supported by credible evidence • Organising, structuring and formatting research papers Practical: *Preparing a paper with the necessary structure and formatting*
14	**Final Exams**

k) Recommended Readings:

American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). American Psychological Association.

Lipson, C. (2019). *Doing honest work in college: How to prepare citations, avoid plagiarism, and achieve real academic success* (3rd ed.). University of Chicago Press.

Structure

The RRSD division would operate in a blended mode, that is, both face-to-face and virtual to accommodate all of its patrons. This mode was supported by the majority of the respondents surveyed.

In terms of the hours of operation, the RRSD would operate a shift system just like the department. It must be noted that while the majority of the respondents prefer a 24/7 access, the division would work towards this by implementing the use of chatbots.

The RRSD would be integrated into UGBCL existing structure as a separate division in a hierarchical structure with three (3) staff as supported by the majority of the respondents and institutional records. A proposed structure of the division can be seen in figure 15 below.



Figure 15. Proposed organisational structure for RRSD

Staffing

Three (3) staff designations/positions were proposed in the survey namely Research & Reference Services Librarian, Assistant Librarian and Digital Services Specialist. However, it must be noted that these designations/positions would be activated in parts, that is, the Research & Reference Services Librarian and the Digital Services Specialist would be first activated followed by the Assistant Librarian. This is so because it will be too costly to activate all at the same time, space constraints, among others. Nevertheless, the job descriptions (JDs) for the three (3) designations/positions were crafted as shown in Tables 18-20 following patterns from other libraries [38-41].

Table 18. JD & specification for Librarian, RRSD

Job Description & Specification	
Job Title:	Research & Reference Services Librarian
Reports To:	Librarian, UGBCL
Department:	Research & Reference Services Division (RRSD)
Position Summary:	The Research & Reference Services Librarian will oversee the provision of academic support services at the University of Guyana Berbice Campus. This role entails actively collaborating with students, staff and members of the general public to support and promote their research and teaching goals via the use of library services and resources skillfully and ethically. The librarian will

	be responsible for developing, teaching and assessing information literacy programmes & instructional materials; providing reference and research support; maximising the benefits of research tools and information resources, among others. Evenings and weekends instruction/reference services may be required when necessary.
Key Responsibilities:	• Develop, deliver and assess formal learning opportunities (e.g. workshops, seminars, information literacy sessions, etc.) in collaboration with academic divisions to promote students' academic capabilities • Provide research assistance/consultations and reference services including use of research tools and databases as well as guidance in writing papers, citations and referencing of materials, formatting of papers, editorial works, among others to students, staff and members of the general public in a variety of formats (in-person, chat, phone, email, zoom, social media platforms). • Review research papers to ensure patrons comply with the style manual selected by the Faculty/University before accepting the same in the collection. • Coordinate, promote, and establish appropriate staffing and coverage for the services provided, and actively participate in all modes of services (in-person, chat, phone, email, zoom, social media platforms…). • Teach a library course with assistance from other staff within the division. This may require working during the evenings and weekends when necessary. • Contribute to the creation and development of tutorials, instructional videos, promotional materials and research guides on library resources • Conduct continuous analysis and evaluation of services and implement any needed changes to reference policies/procedures and services • Engage in continuous professional development by participating in activities pertaining to librarianship, contributing to the profession through research and presentations and maintaining current awareness of libraries' trends. • Supervise the work of the assistant librarian and support staff within the RRSD. • Perform any other related duties.
Qualifications:	• Master's degree preferably in Library Science (MLS) • Minimum of 3 years of experience with providing high quality research and reference services in an academic library setting. • Ability to work in a constantly changing environment while collaborating with diverse students, staff and members of the public. • Possess strong ICT Skills. • Excellent organisation, interpersonal, communication, time management and instructional skills.

Table 19. JD & specification for Assistant Librarian, RRSD

Job Description & Specification	
Job Title:	Assistant Librarian
Reports To:	Librarian, RRSD
Department:	Research & Reference Services Division (RRSD)
Position Summary:	The Assistant Librarian will support the Research and Reference Services Librarian in delivering high-quality academic support services. This role involves assisting the librarian in collaborating with students, staff and members of the general public to support and promote their research and teaching goals via the use of library services and resources skillfully and ethically. It involves supporting the overall operations of the RRSD.
Key Responsibilities:	• Collaborate with faculty to integrate library resources into students' curriculum. • Assist in develop, deliver and assess formal learning opportunities (e.g. workshops, seminars, information literacy sessions, etc.) in collaboration with academic divisions to promote students' academic capabilities • Provide research assistance/consultations and reference services including use of research tools and databases as well as guidance in writing a paper, citations and referencing of materials, formatting of papers, editorial works, among others to students and faculty as well as members of the general public in a variety of formats (in-person, chat, phone, email, zoom, social media platforms…). • Assist in teaching aspects of the library course. This may require working during the evenings and weekends when necessary. • Assist in the creation and development of tutorials, instructional videos, promotional materials and research guides on library resources • Engage in continuous professional development by participating in activities pertaining to librarianship, contributing to the profession through research and presentations and maintaining current awareness of libraries' trends. • Provide general administrative support to the RRSD. • Perform any other related duties as assigned by the Research and Reference Services Librarian.
Qualifications:	• Bachelor's degree preferably in Library Science. • Previous experience with providing research and reference services in an academic library setting. • Proficiency in computer literacy including using research tools/software and databases. • Ability to work independently and as part of a team in a constantly changing environment while collaborating with diverse students, staff and members of the public. • Excellent organisational, interpersonal, communication, time management and instructional skills. • Customer service oriented with a focus on assisting library patrons.

Table 20. JD & specification for Digital Services Specialist, RRSD

Job Description & Specification	
Job Title:	Digital Services Specialist
Reports To:	Assistant Librarian, RRSD
Department:	Research & Reference Services Division (RRSD)
Position Summary:	The Digital Services Specialist will work collaboratively with the librarians in delivering high-quality academic support services. This role involves assisting the librarians in providing technical support and guidance to library patrons including students, staff and members of the general public on using the library services and resources and supporting the overall operations of the RRSD.
Key Responsibilities:	• Provide technical guidance as it relates to use of variety of applications, software, and equipment in formal learning opportunities, research assistance/consultations and reference services to students and faculty as well as members of the general public in a variety of formats (in-person, chat, phone, email, zoom, social media platforms). • Assist in teaching the technical aspects of the library course. This may require working during the evenings and weekends when necessary. • Create and design digital contents including tutorials, instructional videos, promotional materials and research guides on library resources • Troubleshoot and resolve issues for equipment/tools in the division. • Provide training on digital services/tools to staff as the need arises. • Engage in continuous and self-reflective professional development activities to stay current with emerging technologies. • Monitor and evaluate technology services as well as make recommendations for continual developments. • Perform any other related duties.
Qualifications:	• Associate degree in Computer Science, Information Technology or a related field. • Atleast 1-year experience in a technical support role, preferably in an academic library setting. • Strong technical skills in hardware, software and networking. • Ability to work independently and manage multiple tasks simultaneously. • Excellent problem-solving, troubleshooting, communication and instructional skills.

Infrastructure

Establishing a RRSD within UGBCL current physical space would be quite challenging, however, since this is a necessity, the Academia Research Space can be converted to accommodate this division (see Figure 16 below); consultations with patrons will be done in the office and using the reading room/cubicle section of the library if its one-on-one and group respectively.

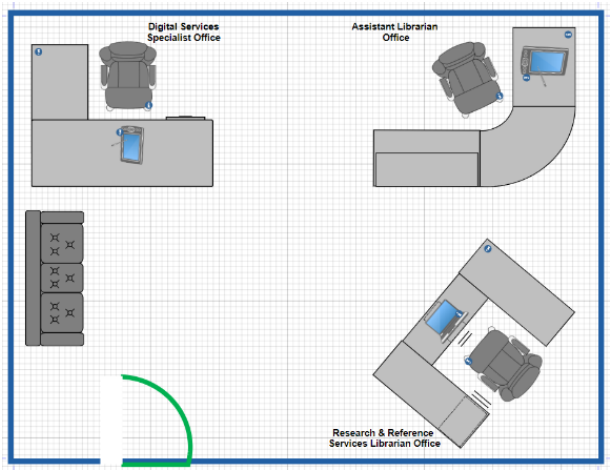

Figure 16. Layout for the proposed RRSD in the current UGBCL space

However, when the proposed new library is built, a new layout can be done (see Figure 17 below).

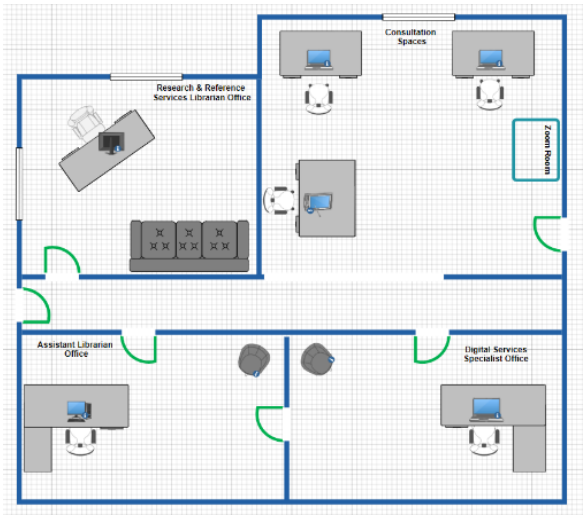

Figure 17. Layout for the proposed RRSD in the new UGBCL space

Overall, the space will be equipped with the necessary infrastructure including ergonomic furniture (desks and chairs), zoom room, consultation spaces and computers/laptops with the necessary research tools/software/databases to accommodate all patrons including those with special needs.

Budget

In estimating a budget for the proposed division, factors like infrastructure, marketing, staff salaries and training were taken into consideration.

Table 21 below displays an estimated budget for the establishment of the proposed division during its first year. The budget covered costs including physical infrastructure, staff salaries, training & PD activities and marketing totaling GY$7,385,000. It's important to note that research tools/software were not budgeted for because the division will utilise the free/trial versions then assess the feasibility of purchasing the same. Additionally, the Assistant Librarian position would not be activated in the first year of operation, as such, only two staff salaries were budgeted for while the office space will be used as a consultation space during the first year.

Table 21. Estimated budget for the proposed RRSD in the current UGBCL space

Description	Quantity	Unit Cost (GY$)	Total Cost (GY$)
Physical Infrastructure:			
• Desks	3	40,000.00	120,000.00
• Chairs	3	65,000.00	195,000.00
• Sofa	1	80,000.00	80,000.00
• Computers/Laptops	3	120,000.00	360,000.00
Staff Salaries & Benefits:			
• Research & Reference Service Librarian	1	4,320,000.00	4,320,000.00
• Digital Services Specialist	1	2,160,000.00	2,160,000.00
Training & Professional Development Activities:			
• Training Sessions	2	50,000.00	100,000.00
Marketing/Promotion			50,000.00
Total			**7,385,000.00**

It must be noted that the RRSD would seek to generate some amount of income to assist with its expenses. Firstly, it can generate income through a mandatory library course (see Table 22 below).

Table 22. Income generated through library course

Course	Estimated Quantity of Students (per year)	Unit Cost (GY$)	Total Cost (GY$)
LIB1100	450	7,000.00	3,150,000.00

Additionally, income will also be generated through charging a fee on certain specialised services as agreed by patrons in the survey. Table 23 below shows the estimated cost attached to these services.

Table 23. Income generation through specialised services

Service	Description	Cost Per Page (GY$)
Editing	Comprehensive editing for grammar, syntax, and style	1,500.00
Proof-Reading	Basic review for typos, grammar, and punctuation errors	500.00
Formatting	Ensuring proper citation style, layout, and structure	1,000.00
Combined Service Package	Includes editing, proof-reading, and formatting	3,000.00

Potential Challenges & Solutions

It must be noted that the survey highlighted a number of potential challenges of establishing the RRSD and their proposed solutions; these were taken into consideration while developing the framework for the RRSD such as operating hours, stakeholders' support, infrastructure including resources, qualified staff, awareness of services and collaboration with academic divisions.

Sustainability Measures

As indicated in the survey, it is important for the RRSD to engage in the following practices to ensure its sustainability.

1. Obtain regular feedback from patrons to improve services.
2. Engage in training and PD activities on a regular basis.
3. Utilise updated technology and resources.

Conclusion

While the current academic environment demands research assistance and advanced reference services, the UGBCL does its best to meet the evolving needs of its patrons without a designated division for the same. As such, in concluding this study, the way forward is to establish the RRSD within the UGBCL. This is both a necessary and feasible decision in order to enhance the academic support services offered to patrons. Further, this will in itself take the pressure off the staff, avoiding the existing staff' perception of feeling overwhelmed and burnout by working beyond the call of duty to deliver these services, in addition to their regular duties. As such, for this study a robust framework for the RRSD was drafted encompassing its goals, service offerings, structure, staffing, infrastructure and budget; possible challenges along with their solutions were also taken into consideration for the way forward.

Additionally, while UGBCL on a previous work plan structure had proposed a division for the same purpose based on observations, this study sought to support the initial idea of establishing the same. Through the analysis of the students and staff feedback, it is evident that there is a significant need for improvement in the availability and quality of academic support services at the Berbice Campus.

Hence, by investing in the necessary infrastructure, engaging in training personnel, fostering stakeholder support, among others, the RRSD will offer a solution that not only meets the immediate research needs of the campus community but also supports long-term academic growth and success. Furthermore, this initiative will also position UGBCL on par with other institutions in this regard.

Recommendations

Based on the findings of this study, the following recommendations are made for the successful establishment and implementation of the RRSD:

1. **Engage Stakeholders Actively:** There must be active collaboration among the administration, library, faculty, students and members of the general public. Also, regular feedback should be obtained from them to customise the services to suit their needs.
2. **Engage in Effective Resource Allocation:** The university should invest in the necessary resources and allocate the same effectively as it relates to infrastructure development such as research tools/software, consultation spaces, etc.
3. **Employ Qualified Staff & Support PD:** The university administration should employ persons with the expertise needed, provide regular training sessions and support PD opportunities. This is critical so as to keep up to date with the evolving research environment.
4. **Engage in Evaluation and Expansion:** The RRSD should be regularly evaluated to ensure that it meets its patrons' needs and

depending on the success of the division, it can offer additional services.

5. **Practice Sustainability Measures:** The university should develop a sustainability plan for the RRSD.
6. **Foster Collaboration with Academic Divisions:** The RRSD should partner with the academic divisions to integrate library resources into the curriculum.
7. **Promote Awareness/Marketing:** The RRSD should actively promote its service offerings through the various platforms, especially through the library's social media pages on a regular basis.
8. **Provision of Additional Databases:** The RRSD should explore other databases and subscribe to the same for patrons to access.
9. **Extend Operating Hours:** The RRSD can consider a shift system and later explore chatbots to offer a 24/7 hrs. service.

These recommendations will aid UGBCL in establishing and implementing a robust division which enhances the academic support at UGBC, thus improving its patrons' university journey/experience and at the same time positioning the library as a central hub supporting the university in its teaching, learning and research.

Conflict of Interest

There is no conflict of interest.

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References

[1]. Naik, M. M., & Padmini, 2014, Importance of information literacy. *International Journal of Digital Library Services, 4*(3), 92-100.

[2]. UGBCL, 2023, Student guide 2023/2024.

[3]. Momoh, E. O., & Folorunso, A. L., 2019, Evolving role of libraries and librarians in the 21st century. *Library Philosophy and Practice (e-journal).* https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=6243&context=libphilprac

[4]. Mussman, D. C., & McGhie, V. F., 2020, Increasing retention of linguistically-disadvantaged college students in South Africa. In: *Beyond Language Learning Instruction: Transformative Supports for Emergent Bilinguals and Educators* by A. Slapac & S. A. Coppersmith. (Hershey, PA: IGI Global), pp. 146-180.

[5]. The University of Edinburgh, 2023, October 25, Academic support librarians. https://www.ed.ac.uk/information-services/library-museum-gallery/academic-support-librarians

[6]. Glasgow Caledonian University, n.d., *Academic support.* https://www.gcu.ac.uk/currentstudents/essentials/library/teaching/academicsupport

[7]. University of Toronto Libraries, n.d., *Reference and research services.* https://oise.library.utoronto.ca/research/reference-and-research-services

[8]. Atlantic Cape Community College, n.d., *Library, tutoring and academic support services.*

https://catalog.atlanticcape.edu/library-tutoring-and-academic-support-services-0

[9]. The University of the West Indies, n.d., *Research assistance.* https://www.mona.uwi.edu/library/research-assistance

[10]. Van Wagenen Library, 2024, April 29, *Information literacy: Instruction sessions*. https://libraryguides.cobleskill.edu/InfoLit/instruction

[11]. Harvard Library, n.d., *Research consultations*. https://library.harvard.edu/services-tools/research-consultations

[12]. Metro State University Library, n.d., *Library classes.* https://library.metrostate.edu/classes/

[13]. The University of Alaska Fairbanks, 2024, January 24. *About reference services.* https://library.uaf.edu/instruction/readings/reference

[14]. Greater Western Library Alliance, 2017, *The impact of information literacy instruction on student success: A multi-institutional investigation and analysis*. https://www.arl.org/wp-content/uploads/2018/10/The_Impact_of_Information_Literacy_Instruction_on_Student_Success_October_2017.pdf

[15]. Bowles-Terry, M., 2012, Library instruction and academic success: a mixed-methods assessment of a library instruction program. *Evidence Based Library and Information Practice 2012, 7*(1), 82-95.

[16]. Carvalho e Rodrigues, M., & Mandrekar, B., 2020, Impact of academic library services on students success and performance. *Library Philosophy and Practice (e-journal).* https://digitalcommons.unl.edu/libphilprac/4246

[17]. Zhong, Y., & Alexander, J., 2007, March 29-April 1, Academic success: How library services make a difference. *ACRL Thirteenth National Conference, Baltimore, Maryland*. https://alair.ala.org/server/api/core/bitstreams/13dcf028-fdac-4a3d-bd49-e1a1067decf4/content

[18]. Cook, J. M., 2014, A library credit course and student success rates: a longitudinal study. *College & Research Libraries, 75*(3), 272-283.

[19]. Bradley, D. R., Oehrli, A., Rieh, S. Y., Hanley, E., & Matzke, B. S., 2020, Advancing the reference narrative: Assessing student learning in research consultations. https://journals.library.ualberta.ca/eblip/index.php/EBLIP/article/download/29634/22142

[20]. Watts, J., & Mahfood, S., 2015, Collaborating with faculty to assess research consultations for graduate students. *Behavioral & Social Sciences Librarian, 34*(2), 70–87.

[21]. Mowreader, A., 2023, July 20, *Lack of awareness causes students to fall through the cracks.* Inside Higher Ed. ttps://www.insidehighered.com/news/student-success/college-experience/2023/07/20/survey-college-students-dont-know-about-support

[22]. Mensah, V., & Afful-Arthur, P., 2019, Knowledge and accessibility of library resources and support services by distance learners: a study of University of Cape Coast Library. *International Journal of Information Studies & Libraries, 4*(2), 37-45.

[23]. Makibinyane, J. M., & Khumalo, S. S., 2021, Exploring factors that impede student support services and throughput rate: the case of TVET colleges in South Africa. *International Journal of Education Economics and Development, 12*(4), 397-411.

[24]. Hickey, G., McGilloway, S., O'Brien, M., Leckey, Y., Devlin, M., & Donnelly, M., 2018, Strengthening stakeholder buy-in and engagement for successful exploration and installation: a case study of the development of an area-wide, evidence-based prevention and early intervention strategy. *Children and Youth Services Review, 91,* 185-195.

[25]. Zvirikuzhe, W., 2023, August 7, 5 Keys to remember when starting a new department. LinkedIn. https://www.linkedin.com/pulse/5-keys-remember-when-starting-new-department-winston-zvirikuzhe

[26]. Jansen, D., & Warren, K., 2020, *What (exactly) is research methodology?* GradCoach. https://gradcoach.com/what-is-research-methodology/

[27]. Khanday, S. A., & Khanam, D., 2019, The research design. *Journal of Critical Reviews, 6*(3), 367-376.

[28]. Jain, Y., 2024, March 8, 5 Types of research design – Elements, needs and characteristics. *Emeritus*. https://emeritus.org/in/learn/types-of-research-design/

[29]. Ary, D., Jacobs, L. C., Sorenson, C., & Razavieh, A, 2010, Introduction to Research in Education 8th ed (Belmont, CA: Wadsworth Cengage Learning).

[30]. Colorado State University, 2004, An introduction to content analysis. http://www.umsl.edu/~wilmarthp/mrpc-web-resources/content-analysis.pdf

[31]. Creswell, J. W., & Creswell, J. D., 2018, Research Design: Qualitative, Quantitative and Mixed Methods Approaches 5th ed (*Sage Publications*).

[32]. Ida, L., 2016, Influence of library services on students' academic performance in an ordinary certificate of secondary education examination in Mtwara Mikindani Municipality, Tanzania [dissertation]. *University of Tanzania.* http://repository.out.ac.tz/1822/1/DISSERTATION_-_LEO_IDA_FINAL.pdf

[33]. Creswell, J., 2012, Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research, 4th ed (*Pearson Education*).

[34]. Creswell, J., 2013, Qualitative Inquiry and Research Design: Choosing Among Five Approaches 3rd ed (*Los Angeles: SAGE*).

[35]. Fleming, J., & Zegwaard, K. E., 2018, Methodologies, methods and ethical considerations for conducting research in work-integrated learning. *International Journal of Work-Integrated Learning, 19*(3), 205-213.

[36]. University of Limerick Library, n.d., *Library classes for your students*. https://www.ul.ie/library/supporting-you/supporting-teaching/library-classes-for-your-students

[37]. University of Massachusetts Global Library, 2024, January 22, *Library 101 Curriculum.* https://umassglobal.libguides.com/Library101

[38]. Singapore Management University, 2020, *Job description.* https://library.smu.edu.sg/sites/library.smu.edu.sg/files/library/pdf/CareerAd/JD_RL%20Law_15Jul2020.pdf

[39]. University Library, Portland State University, n.d., *Research and Instruction Librarian/Instructor*. https://library.pdx.edu/wp-content/uploads/Job-Posting-Research-Instruction-Librarian.pdf

[40]. South Carolina State Library, n.d., *Research and Instruction Librarian*. https://www.dcu.ie/sites/default/files/inline-files/BC220503%20Assistant%20Librarian%20%28Open%20Research%29%20Job%20description.pdf

[41]. Barrington Area Library, n.d., *Job description: Digital Services Specialist.* https://balibrary.org/about1/1531-digital-services-specialist

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The Role of Psychological Safety in High-Performing Teams: A Principal's Perspective

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Abstract

Psychological safety – a shared belief that the team environment is safe for interpersonal risk-taking – has emerged as a pivotal factor in team success. High-performing teams often distinguish themselves not only by skill and talent, but by an atmosphere of trust and openness where members feel safe to voice ideas and concerns. This study examines how psychological safety contributes to the effectiveness of high-performing teams in organizations. It builds on literature and empirical findings to understand the mechanisms through which psychological safety enhances team communication, learning, innovation, and overall performance. Teams with high psychological safety show significantly better communication, more learning behaviors, greater innovation, and improved performance outcomes than teams with low psychological safety. Psychological safety facilitates open discussion of errors and ideas, leading to more effective decision-making and problem-solving. Empirical evidence indicates positive correlations between psychological safety and team performance, engagement, and well-being: for example, companies high in psychological safety report 50% higher productivity and 76% more employee engagement on average. The findings suggest that psychological safety is a foundational element of high-performing teams, enabling interpersonal risk-taking, collaborative learning, and resilience. Key antecedents include inclusive leadership and a trustful, no-blame culture, which together create conditions for psychological safety to flourish. Practical implications are discussed for leaders aiming to build psychologically safe and high-performing teams. Psychological safety plays a critical role in team effectiveness by fostering an environment where members can speak up, innovate, and learn without fear. Organizations that cultivate psychological safety are better positioned to achieve sustained high performance.

Keywords: *High-Performing Teams, Inclusive Leadership, Innovation, Organizational Behavior, Psychological Safety, Team Learning, Team Performance.*

Introduction

High-performing teams are the cornerstone of organizational success in today's knowledge-driven economy. Researchers and practitioners have increasingly recognized that beyond individual talent and technical skills, team climate and culture significantly influence performance outcomes [8, 9]. One cultural factor that has received growing attention is psychological safety, defined as a *"shared belief held by members of a team that the team is safe for interpersonal risk-taking"* [1,6] [1]. In a psychologically safe team, individuals feel confident that they will not be punished or humiliated for speaking up with ideas,

[1] Psychological Safety | Office of the Ombuds, https://www.bu.edu/ombuds/resources/psychological-safety/

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questions, concerns, or mistakes [6, 1]. This concept is not equivalent to mere group cohesiveness or "being nice" – it does *not* imply the absence of accountability or the presence of uncritical positivity [10][2]. Rather, psychological safety is characterized by mutual trust and respect, where members believe their team will give them the benefit of the doubt when they take interpersonal risks [1].

As a principal at a leading technical institute in Guyana, I have witnessed firsthand the transformative role of psychological safety in shaping high-performing teams. In an academic and technical training environment, staff and students face constant pressures—ranging from curriculum changes to industry demands and resource limitations. Creating a climate of psychological safety became essential in enabling my team of educators, administrators, and support staff to work collaboratively, embrace innovation, and overcome challenges.

Psychological safety has been identified as a critical ingredient for team learning and performance. Edmondson's foundational research demonstrated that teams with higher psychological safety engage in more open communication, learning behaviors (such as discussing errors and seeking feedback), and adaptive performance [11]. Conversely, in teams lacking psychological safety, members are more likely to stay silent, withhold ideas or concerns, and avoid taking risks, which can stifle learning and hinder performance [12]. The notion of psychological safety was initially introduced in the context of individual engagement at work, describing it as a condition where people feel free to express themselves without fear of damage to self-image or career [13]. It was later extended the concept to the team level, emphasizing its role in enabling team learning and quality decision-making in organizations [6]. Over the past two decades, a substantial body of literature has developed around psychological safety, linking it to outcomes ranging from better team effectiveness and error reduction to higher rates of innovation and employee well-being [4, 5].

Psychological safety allowed teachers and staff at the technical institute to voice their concerns, share ideas, and propose improvements without fear of criticism or reprisal. For example, during curriculum reform discussions, team members felt empowered to challenge traditional teaching approaches and suggest [3] integrating more industry-relevant, technology-driven strategies. This open exchange not only improved the quality of program delivery but also fostered ownership and commitment among faculty [3][4].

Notably, industry case studies have reinforced academic findings. A famous example is Google's two-year internal study known as "Project Aristotle." Google examined over 180 teams to determine what distinguished the highest performers, expecting factors like team composition or individual intelligence to matter most. To their surprise, the analysis revealed that *the single most important factor for high team performance was psychological safety* [14]. The highest-performing teams at Google shared a climate of trust where members felt safe to take risks and make mistakes without retribution [14]. This insight reports that *psychological safety is consistently one of the strongest predictors of team performance, quality, and innovation* across a range of industries [9]. When present, it substantially contributes to *better decision-*

[2] (PDF) Identifying the Key Elements of Psychologically Safe Workplaces in Healthcare Settings

https://www.researchgate.net/publication/374635227_Identifying_the_Key_Elements_of_Psychologically_Safe_Workplaces_in_Healthcare_Settings

[4] Enhancing Psychological Safety with Behavioural Insights

https://behaviouralleeway.com/enhancing-psychological-safety-with-behavioural-insights/

making, higher engagement, and improved overall team effectiveness [4]. In fact, a McKinsey global survey found that 89% of employees consider psychological safety essential in the workplace [15].

Beyond performance metrics, psychological safety has important implications for employee mental health and retention. Teams with psychologically safe climates tend to have members who are more engaged and less stressed. According to Accenture data, companies that cultivate high psychological safety experience 74% less stress among employees and 27% lower turnover, alongside greatly improved engagement and productivity [6]. Employees in such environments are more likely to report higher job satisfaction and "bring their full selves" to work, contributing positively to team morale and creativity [4]. On the other hand, low psychological safety can create a "culture of silence" where problems fester. High-profile organizational failures (e.g., the Volkswagen emissions scandal or ethical breaches at financial institutions) have been partly attributed to climates where employees felt afraid to speak up about issues [16, 17]. These cases underscore that psychological safety is not a "soft" issue, but a fundamental aspect of organizational risk management and learning.

In practice, I have found that modeling vulnerability and openness as a leader—by admitting mistakes and actively listening—helped normalize risk-taking and honest dialogue. This encouraged staff to experiment with new teaching methodologies and student engagement strategies, even when outcomes were uncertain. In turn, these efforts contributed to stronger student performance, higher retention rates, and greater alignment between the institute's training and national workforce needs.

Moreover, psychological safety proved critical during periods of organizational stress, such as funding shortfalls or rapid technological transitions. Instead of disengaging, my team leaned on trust and collaboration to generate solutions, demonstrating resilience in the face of uncertainty. This experience underscored that high performance is not merely the product of technical expertise, but also of a supportive environment where individuals feel respected, valued, and safe to contribute.

Research gap and Relevance: While the importance of psychological safety is well recognized, organizations often struggle with how to build and sustain it, particularly under pressures for performance. Surveys indicate that only about *one quarter of leaders consistently exhibit behaviors that foster psychological safety* in their teams [18]. There is a need to better understand the concrete ways in which psychological safety drives team excellence and how leaders and team members can actively cultivate this quality. This study focuses on the role of psychological safety in high-performing teams, synthesizing current knowledge and identifying practical implications. We address how psychological safety contributes to team effectiveness (in terms of performance, innovation, and collaboration), what factors promote or hinder psychological safety, and what can be done to enhance it in organizational settings.

Research Objectives

To guide this inquiry, the research aims were defined as follows:

1. **Objective 1:** To examine the concept of psychological safety and its relevance to team effectiveness, including definitions and theoretical foundations (drawing on foundational works like Edmondson, 1999 and Kahn, 1990).
2. **Objective 2:** To analyze empirical evidence linking psychological safety with high team performance and other positive outcomes (e.g. decision quality, productivity, innovation), including findings from recent studies and meta-analyses.

3. **Objective 3:** To identify key factors and antecedents that foster or hinder psychological safety in teams – such as leadership behaviors, organizational culture, team norms, and structural elements – based on literature and case examples.
4. **Objective 4:** To explore practical strategies and implications for managers and organizations to cultivate psychological safety in teams, thereby enhancing overall team performance and well-being. This includes discussing interventions, training, or leadership practices recommended in the literature.

Through these objectives, the study seeks to provide a comprehensive understanding of why psychological safety matters for high-performing teams and how it can be nurtured, aligning with university-level academic inquiry and practical relevance for management.

Methodology

Research Design: This study is qualitative literature-based research structured as a narrative review and thematic analysis. Rather than collecting primary data existing scholarly work and reported evidence on psychological safety in teams were systematically reviewed. The approach follows academic conventions for an integrative review, aiming to synthesize knowledge and derive insights applicable to management practice.

Inclusion Criteria: Sources were included if they specifically addressed psychological safety at the team or organizational level and reported on its impact on performance or related outcomes (learning, innovation, etc.), or if they examined factors influencing psychological safety. Studies of all types were considered – quantitative (e.g., surveys, experiments, meta-analyses) and qualitative (e.g., case studies, interviews) – to capture a holistic view. Given the focus on high-performing teams, particular attention was paid to research in organizational settings where team performance could be objectively or subjectively assessed (corporate teams, healthcare teams, project teams, etc.). Notably, literature from high-risk industries (healthcare, aviation, public safety) was included as they often highlight the critical role of speaking up and its performance consequences, offering generalizable insights [12, 19].

Data Extraction and Thematic Analysis: For each selected source, key findings and conclusions were extracted. Using a thematic analysis approach, these findings were coded into categories corresponding to the research objectives. Emergent themes included: *communication openness*, *error reporting and learning*, *team innovation*, *employee engagement and well-being*, *leadership influence*, and *cultural factors* (like trust and blame). The analysis was iterative; as we reviewed more sources, we refined themes and identified patterns of agreement or discrepancy across studies.

Quality and Bias Consideration: The credibility of sources were assessed by favoring peer-reviewed and highly cited works. Meta-analytic and review were used to ground claims in aggregated evidence. Where practitioner sources are cited (e.g., HBR or industry surveys), they are triangulated with academic findings. Since this is a literature review, there is an inherent bias towards published positive results; an attempt to note any conflicting findings or nuances (such as potential downsides of psychological safety or boundary conditions) were reported in the literature.

Limitations: No new empirical data were collected, so the study is limited by what has been examined in existing research. Also, psychological safety research often relied on self-reported perceptions and correlational designs, which were acknowledged when interpreting causality. Nonetheless, including experimental evidence (such as a randomized field experiment) helped strengthen causal

arguments [2][5]. The methodology is appropriate for the exploratory nature of our objectives, allowing a rich, evidence-based discussion suitable for an academic journal article.

Results

Psychological Safety as a Catalyst for Team Performance

The literature consistently shows that psychological safety is a catalyst for multiple dimensions of team performance. High levels of psychological safety are associated with better team task performance, more effective decision-making, and higher overall productivity [2, 5]. For instance, in a field study it was found that teams where individuals *felt safe to voice their ideas* had significantly higher performance and innovation outcomes than those that did not [2]. The same study implemented an intervention and observed improvements in perceived innovativeness and leadership quality when managers focused on meeting employees' psychological needs, underscoring that psychological safety can be intentionally fostered to boost performance [2]. These findings align with a broad consensus: *teams thrive when members feel free to speak up*. According to a McKinsey explainer, psychological safety is *"consistently one of the strongest predictors of team performance, productivity, quality, safety, creativity, and innovation."* [9] In other words, psychological safety is not just a "nice-to-have" — it has tangible performance payoffs across diverse contexts.

Decision-making and error management: Teams high in psychological safety make *better decisions under complex and uncertain conditions*. When individuals trust that they will not be ridiculed or penalized, they are more likely to share unique information, admit uncertainties, and collaboratively evaluate alternatives. This reduces the risk of "groupthink" and leads to more well-informed, diverse perspectives feeding into decisions [7]. Studies show that psychological safety allows team members to take moderate risks and "stick their neck out" with novel ideas or dissenting opinions, which are exactly the behaviors that often lead to market breakthroughs and process improvements [6]. In a classic example, it was found that teams with high task conflict (differing ideas) only translated that conflict into better performance when psychological safety was high. In teams lacking psychological safety, conflict tended to be unproductive or suppressed altogether; but in a psychologically safe climate, conflict could be harnessed constructively to improve outcomes [1].

Psychological safety also plays a crucial role in error management and learning. Edmondson's early research in healthcare teams observed a paradox: *teams with higher psychological safety reported more errors, but they also performed better* in the long run because those errors were openly discussed and learned. It turned out that psychologically safe teams did not necessarily make more mistakes [7] – they were simply more willing to report and confront mistakes, turning them into opportunities for improvement. Subsequent studies in hospitals confirmed that units with higher psychological safety have *higher rates of error reporting and lower actual error harm rates*, thanks to continuous learning cycles. By contrast, teams in low safety environments often hide or ignore errors due to fear, which prevents learning and can degrade performance over time. As was noted in a recent review, a

[5] Fostering Psychological Safety in Teams: Evidence from an RCT by Silvia Castro, Florian Englmaier, Maria Guadalupe : SSRN, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4141538

[6] High-Performing Teams Need Psychological Safety: Here's How to Create It

https://hbr.org/2017/08/high-performing-teams-need-psychological-safety-heres-how-to-create-it

"culture of trust, transparency, and open communication fosters greater psychological safety and improved teamwork and well-being," [11] whereas overly rigid, punitive climates suppress voice and hinder innovation [7].

Impact on Innovation and Learning Behaviors

Psychological safety is a wellspring for team learning behaviors, creativity, and innovation. When team members feel safe, they are more likely to ask questions, seek feedback, and share half-formed ideas – behaviors that are essential for learning and creative problem-solving [3]. Research has shown that in high-tech enterprises demonstrated a direct link between team psychological safety and employee innovative performance, mediated by open communication behaviors[7]. In the study of 580 employees, teams with greater psychological safety (characterized by collaboration, information sharing, and equitable "give-and-take" in dialogue) showed significantly higher innovation performance at the individual level. The reason, as they found, was that psychological safety encouraged more robust communication: team members freely exchanged ideas and built on each other's suggestions, fueling creativity. Communication acts as a critical conduit and it was observed that psychological safety's effect on innovation was largely indirect, through enhanced communication quality [5]. This underscores that one of psychological safety's primary benefits is unleashing information flow and knowledge sharing in teams, which in turn drives innovation.

Broader literature supports these findings. A meta-analysis covering 117 studies confirmed that psychological safety is positively related not only to task performance but also to learning behavior in teams [6]. Teams with psychologically safe climates are more willing to engage in knowledge-sharing activities, seek feedback, experiment, and reflect on outcomes. As a result, they adapt and improve more quickly than teams with defensive, low-safety climates [9]. Similarly, it was found that psychological safety significantly improves *team learning and team efficacy*, which then boosts team productivity [7]. Their survey of professional teams showed that psychological safety was favorably correlated with perceptions of team effectiveness, supporting the idea that *learning behaviors serve as a mechanism linking safety to performance* [7]. Psychological safety thus mitigates the personal risk involved in innovation, creating a zone where *failing fast and learning fast* is accepted as part of the creative process [28[8]].

Employee Engagement, Well-Being, and Retention Outcomes

Another set of results link psychological safety to **employee engagement and well-being**, which are themselves determinants of team performance. When team members feel psychologically safe, they tend to be more engaged in their work [13]. They invest more of themselves – cognitively and emotionally – because they do not fear interpersonal danger in the team context. Empirical support that psychological safety consistently correlates with higher job satisfaction, commitment, and *intent to stay* with the organization. In essence, a psychologically safe team is a more satisfying team to work in, which can reduce turnover and preserve team knowledge and cohesion.

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[7] The impact of team psychological safety on employee innovative performance a study with communication behavior as a mediator variable | PLOS One, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0306629

[8] The Power of Psychological Safety: Investigating its Impact on Team Learning, Team Efficacy, and Team Productivity

https://openpsychologyjournal.com/VOLUME/16/ELOCATOR/e187435012307090/FULLTEXT/

Data from organizational surveys provide striking evidence: According to research cited by McKinsey, nearly 90% of workers believe it's the responsibility of leadership to create a safe environment, and when that exists, engagement soars [9]. Accenture's findings quantify this: teams with high psychological safety see *76% more engagement* and *27% lower turnover* than those with low safety [6]. They also see significantly *lower stress and burnout* rates [6]. These statistics align with academic findings that psychological safety helps meet humans' intrinsic needs for inclusion and esteem at work, thereby improving mental health. In high-stress professions, like frontline healthcare and public safety, the presence of a psychologically safe climate has been tied to lower psychological distress among employees and greater willingness to utilize peer support [11]. For instance, hospitals with strong psychological safety norms not only report better patient outcomes but also lower nurse burnout and higher job fulfillment [7].

From a team performance standpoint, engaged and healthy team members are more productive and collaborative. Thus, psychological safety's contribution to engagement and well-being creates a positive feedback loop: engaged employees contribute more proactively to the team, further enhancing performance. It is noted that *inclusive leadership* (leaders who are open, accessible, and attentive) increases psychological safety, which in turn raises employee involvement in creative tasks and organizational citizenship behaviors. Such behaviors – going above and beyond basic duties – are indicators of high engagement and directly benefit team functioning. The practical implication is that psychological safety is not just a moral or health concern; it is strategically linked to retaining talent and maximizing their contributions within teams.

Key Empirical Findings Summary

Discussion

How Psychological Safety Drives Team Effectiveness

The results from this study affirm that psychological safety is a linchpin of high team performance, functioning through multiple interrelated pathways. First, drawing on Edmondson's theoretical lens, psychological safety promotes a learning-oriented team climate. In a psychologically safe team, members actively share information and ask for help without fear [8]. This free flow of information increases the team's collective knowledge and its ability to self-correct. Teams can detect and address errors or inefficiencies early, which improves reliability and quality (a phenomenon noted in healthcare teams where high psychological safety led to improved patient outcomes via more error reporting and learning). In essence, psychological safety transforms mistakes and divergent ideas from potential crises into learning opportunities. Over time, this accelerates team development and adaptation, crucial for remaining high-performing in dynamic environments.

Second, psychological safety enhances interpersonal risk-taking in service of the team's goals. This includes speaking up with novel ideas, admitting lack of knowledge, or challenging the status quo. These behaviors are often risky for individuals because they expose one to possible embarrassment or conflict. However, they are also the behaviors that drive innovation and continuous improvement. When team members do not fear negative consequences, they contribute more creatively. As one study phrase puts it, *"psychological safety is the assurance to take interpersonal*

[9] The Benefits of Psychological Safety: Boosting Employee Well-Being and Performance | Cooleaf https://www.cooleaf.com/blog/the-benefits-of-psychological-safety-boosting-employee-well-being-and-performance

risks without fearing adverse consequences", which *"promotes innovation, collaboration, and continuous learning."* [10]. High-performing teams, by contrast, often display a *blame-free culture* where the emphasis is on problem-solving, not punishing the messenger of bad news [4].

Third, psychological safety contributes to building team efficacy and cohesion, which reinforce performance. When members feel safe, they develop a stronger belief in the team's capability to handle challenges (collective efficacy), because they know everyone can contribute without trepidation. Psychological safety improved team efficacy perceptions which then boosted productivity [17]. Additionally, trust and mutual respect are strengthened in a psychologically safe environment, because people see that their colleagues have positive intentions toward them. Over time, this can deepen team cohesion – but importantly, it's a form of cohesion that does not stifle dissent (unlike groupthink), but rather one that supports *constructive dissent*. The discussion climate is respectful yet candid. It is found at the technical institute that teams with inclusive leaders (who encourage input from all members) had higher psychological safety and in turn displayed more team involvement and innovation. Their work highlights that *leadership inclusiveness fosters both safety and a shared commitment to excellence*, which is a recipe for high performance.

While psychological safety clearly boosts team effectiveness, it is not a panacea or an excuse to avoid accountability. It was emphasized – and our findings bear repeating – that psychological safety and accountability for results must coexist for optimal team performance [7]. A potential misinterpretation of psychological safety is that it could lead to complacency or an overly "comfortable" culture where poor performance is tolerated. However, true psychological safety is about candor in the pursuit of excellence. As noted, a psychologically safe workplace is *"one in which interpersonal fear is unwelcome"*, enabling better performance and learning [11]. It does not mean that standards are lowered or that conflict is eliminated; rather, conflict is approached in a collaborative manner and standards can be even higher because the team can openly discuss how to meet them. High-performing teams often balance a "high safety, high accountability" environment [7] members feel safe to take risks *and* know they are expected to[12] deliver. In such teams, if someone underperforms or an idea fails, it's discussed openly and factually (no finger-pointing) and used to strategize improvements, maintaining accountability while preserving dignity.[13]

Antecedents and Enablers of Psychological Safety

Understanding what enables psychological safety in teams is crucial for leaders aiming to build high performance. The literature points to several **key antecedents**:

1. **Leadership Behavior:** Perhaps the most significant factor is leadership style. Consistent findings show that *inclusive, supportive, and transformational leaders* create conditions for psychological safety [7]. Leaders who are approachable, admit their own fallibility, and invite input signal that it's safe for others to speak up [15].

[10] Enhancing Psychological Safety with Behavioural Insights

https://behaviouralleeway.com/enhancing-psychological-safety-with-behavioural-insights/

[11] Psychological Safety | Office of the Ombuds, https://www.bu.edu/ombuds/resources/psychological-safety/

This behavior is often termed "leader inclusiveness."

2. **Transformational leaders** – those who inspire, coach, and foster an open dialogue – also elevate psychological safety by building trust and a shared vision where speaking up is seen as contributing to the mission [15]. In contrast, authoritarian or punitive leadership tends to crush psychological safety. Leaders who react angrily to bad news or dismiss suggestions quickly create a chilling effect. It was found that *"overly rigid hierarchies often suppressed employee voice and innovation,"* whereas ethical, inclusive leadership was strongly associated with high psychological safety levels [1]. A practical tip emerging from Edmondson's work is for leaders to model vulnerability, e.g., start meetings by saying "I may miss something; I need your input" thereby normalizing fallibility and inviting others to contribute [7, 11]. This flattens the power distance and encourages a participative climate.
3. **Team Interpersonal Climate:** Teams that develop norms of mutual respect, trust, and open communication naturally cultivate psychological safety [13]. Trust is both a precursor and a product of psychological safety – initial trust allows people to test the waters by speaking up, and if that goes well, psychological safety grows, which further reinforces trust. It was noted at the technical institute that reducing interpersonal fear (i.e., increasing psychological safety) was essential for creating a climate where people could accept and act on honest feedback, which is fundamental for any team learning or change. The review indicates that teams which intentionally practice supportive communication behaviors – active listening, constructive feedback, appreciation of contributions – build a safe atmosphere. For instance, teams that conduct *after-action reviews* (post-project debriefs) in a non-blaming way see improvements in psychological safety over time. Conversely, if team interactions are riddled with sarcasm, blame, or dismissiveness, members learn quickly that vulnerability is dangerous, undermining safety. Team diversity can also interplay with psychological safety: diversity of perspectives has huge performance benefits *if* psychological safety is high (because diverse members feel included and can voice unique ideas), but diversity without safety can lead to factionalism or silence from minority voices. Thus, inclusive team practices (rotating meeting facilitation, ensuring everyone speaks, addressing microaggressions) are important to maintain safety in diverse teams.
4. **Organizational Culture and Structures:** At a higher level, organizational context sets the tone for team psychological safety. Companies that espouse and enact learning culture values; e.g., "we learn from failure," "speaking up is valued"; empower teams to be safe. Rewards and evaluation systems that do not punish (or that even reward) people for raising issues can incentivize candor. Some tech firms, for example, have instituted "best failed idea" awards to celebrate employees who took smart risks that didn't pan out, reinforcing that the organization stands behind risk-takers. Hierarchical structure also matters. While some hierarchy can provide clarity, *overly steep hierarchies are inimical to psychological safety*. In very hierarchical settings (military, hospitals), deliberate efforts like team training in "flattening" communications (e.g., using first names in simulations, encouraging junior staff to question senior staff through structured protocols) have been used to increase psychological safety. The highlighted that in high-risk fields, strict hierarchies often

prevent lower-rank members from speaking up, whereas organizations that cultivated more egalitarian communication norms saw higher psychological safety and better team outcomes[14]. Organizational policies such as open-door policies, anonymous feedback channels, and visible executive support for employee voice (e.g., CEOs holding town halls and thanking employees for tough questions) all contribute to a broader culture that feeds team-level psychological safety.

5. **Shared Experiences of Success in Speaking Up:** One often overlooked enabler is teams shared past experiences. If a team has early experiences where someone spoke up about a problem and the team handled it well (listened and solved it rather than shooting the messenger), that becomes a "safe precedent," reinforcing psychological safety [7]. This suggests a practical point: when forming new teams, how leaders handle the *first instances* of risk-taking or error reporting can set the climate for the future. Leaders should treat these moments carefully – thank the person, address the issue constructively – to bank trust. Over time, accumulated positive interactions create a *self-reinforcing spiral*: psychological safety begets more speaking up, which, when handled supportively, further strengthens psychological safety.

Practical Implications for Building High-Performing Teams

The convergence of evidence on psychological safety offers clear **practical guidelines** for managers and organizations seeking high-performing teams:

1. **Demonstrate Supportive Leadership:** Leaders at all levels should actively cultivate an environment of openness. This can be done by *explicitly inviting input*, asking questions like "What are we missing?" or "Does anyone see risks or have a different perspective?" on team decisions. Leaders must respond appreciatively to input – especially critical or dissenting input. Even if an idea is not adopted, saying something like "Thank you for raising that concern – it's important we consider all angles," reinforces safety. Leaders should also share their own thought process and even mistakes. As one Google leader quoted, *"There's no team without trust."* By acknowledging their own missteps ("I was wrong about X, here's what I learned…"), leaders' model that it's acceptable to be fallible [14]. This approach echoes transformational leadership behaviors – individualized consideration and intellectual stimulation – which have been empirically tied to higher team psychological safety [7].
2. **Establish Norms of Open Communication:** Teams can set ground rules such as "We critique ideas, not people," "Every idea is worth hearing," and "It's okay to say 'I don't know' or to ask for help." Such norms, when reinforced in every meeting, create a consistent expectation of safety. Techniques from agile project management like *"retrospectives"* (where teams discuss what went well and what didn't, in a blameless way) help normalize constructive feedback. Encouraging equal participation is also key – tools like round-robin sharing or anonymous idea submissions (which can then be discussed) ensure that quieter members or those lower in status have a voice. Research shows that teams where a few people dominate conversation are often less collectively intelligent than teams with more equal

[14] Antecedents of Workplace Psychological Safety in Public Safety and Frontline Healthcare: A Scoping Review, https://www.mdpi.com/1660-4601/22/6/820

turn-taking, which correlates with psychological safety allowing everyone to contribute. Thus, managers should be vigilant for any signs of silencing or imbalance and intervene to re-open the space.

3. **Avoid Blame and Emphasize Learning:** When failures or issues occur, managers should approach them with a *learning mindset rather than a blame mindset*. This may involve conducting a **post-mortem analysis** focusing on process improvements ("What can we learn? How do we prevent this in future?") instead of singling out individuals for punishment. By systematically doing this, teams internalize that pointing out a problem *will not result in scapegoating*. A powerful practice from high-risk industries is the use of *"Just Culture"* principles – separating blameworthy acts (like willful negligence) from human errors or system failures. In a Just Culture, employees are treated fairly and are actually rewarded for speaking up about near-misses or mistakes, because doing so improves safety for all. This approach has clear parallels to fostering psychological safety. Adopting such principles can improve overall organizational performance; for example, some airlines and hospitals attribute their excellent safety records to creating an atmosphere where front-line staff can halt operations or report problems without fear (resulting in proactive fixes). For a corporate team, this might translate to empowering any team member to voice ethical concerns or quality issues immediately, assured that leadership will address the message, not shoot the messenger.
4. **Train and Coach Teams on Interpersonal Skills:** Sometimes, the lack of psychological safety is not due to hostility but due to team members simply not knowing *how* to communicate supportively or how to respond to conflict. Organizations should invest in training programs that include active listening, giving and receiving feedback, conflict resolution, and inclusive meeting facilitation. Role-playing exercises can be effective – for instance, practicing how to react when someone criticizes your idea, or how to challenge an idea constructively. Such training builds confidence and shared understanding among team members on maintaining a respectful dialogue. Coaching can also be directed at leaders to increase self-awareness of their reactions; even subtle non-verbal cues (eye-rolling, sighing) or micro-comments can undermine safety, and leaders might not realize they do it. Through coaching and feedback (e.g., 360-degree feedback where employees rate managers on creating an open climate), leaders can improve. According to a McKinsey study, only 26% of leaders consistently behave in ways that support psychological safety [18], indicating a large gap that training and development can address.
5. **Measure and Monitor Psychological Safety:** As the adage goes, "what gets measured gets managed." Teams and organizations should consider periodically assessing psychological safety (anonymously) using survey instruments (Edmondson's 7-item Team Psychological Safety Scale is a common validated tool). By including items like "If you make a mistake on this team, it is often held against you" (reverse-scored) or "Members of this team are able to bring up problems and tough issues," managers can gauge the current level of safety. The results can pinpoint problem areas or subgroups that feel less safe. Monitoring over time also shows if interventions are working (e.g., after leadership training or a reorganization). Some companies incorporate psychological safety metrics

into broader employee engagement surveys and treat them as leading indicators of team performance. If a drop in psychological safety is detected, it should prompt managerial inquiry and action (much like a rise in defect rates would prompt investigation in a production process).

Limitations and Boundary Conditions

While extolling the virtues of psychological safety, it is important to note boundary conditions. Most research finds positive effects for psychological safety, but there are a few nuances:

1. **Cultural Context:** The expression and impact of psychological safety might differ across cultures. In more collectivist or high power-distance cultures, employees may be naturally reticent to voice dissent to authority, so building psychological safety could be more challenging or require culturally tailored approaches (like leveraging group consensus-building to surface issues). Some studies in East Asian contexts, for instance, suggest that even with psychological safety, employees may prefer indirect ways of speaking up (such as through an intermediary) to save face. Managers need cultural intelligence to adapt practices that foster safety without clashing with deep-seated norms of respect.
2. **Nature of Work:** In creative and knowledge-intensive work, psychological safety has near-universally positive impacts on performance through innovation and learning. However, in certain high-compliance or routine tasks (say, a strict assembly line or military drill), constant questioning might not be as welcomed during the execution phase (though it would be during training and debriefing). The key is balancing when divergence is useful versus when convergence and discipline are needed. Even in such environments, though, psychological safety is crucial when anomalies or improvements need reporting – so it is more about timing and context of voice rather than whether voice is allowed at all.
3. **Overconfidence Risk:** A highly psychologically safe team might become overconfident in its ideas if not paired with healthy external feedback. Teams should remain open to external critique – psychological safety should extend to inviting feedback from outside the team as well, to avoid group isolation. As long as the team doesn't equate safety with "we're always right," this is manageable. Encouraging a humble, learning orientation is the antidote to any complacency; psychological safety actually enables humility, because people can admit flaws. Leaders should continuously reinforce that safety exists *so that* we can improve and reach ambitious goals, not to make things comfortable.

In summary, when implemented with these considerations in mind, psychological safety becomes a powerful engine for team effectiveness.

Conclusion

This research set out to explore the role of psychological safety in high-performing teams, and the evidence gathered leads to a clear conclusion: psychological safety is a fundamental driver of team excellence. High-performing teams thrive in climates where members feel safe to contribute their ideas, voice concerns, and take interpersonal risks in the pursuit of team goals. Such climates unlock critical behaviors – open communication, continuous learning, innovation, and mutual support – that directly enhance performance, adaptability, and innovation.

Key conclusions drawn from the literature include:

1. **Psychological safety enables superior team performance** by fostering open

dialogue and learning. Teams that cultivate psychological safety make better decisions and avoid catastrophic errors, as individuals are more likely to speak up about potential issues and share information that others need to hear [9]. Over time, this leads to measurable gains in productivity, quality, and innovation, distinguishing high-performing teams from their peers.

2. **The impact of psychological safety is multi-faceted:** it not only improves task performance outcomes but also boosts team processes and human factors such as engagement, creativity, and resilience. A psychologically safe team is more engaged and resilient in the face of challenges, meaning it can sustain high performance even under pressure. Moreover, psychological safety contributes to the *"agility"* of a team – its ability to rapidly learn and pivot – which is increasingly crucial in today's fast-changing environment.
3. **Building psychological safety is both an individual and organizational responsibility.** Leaders play a pivotal role in modeling and rewarding the behaviors that create safety, but every team member contributes to the climate through daily interactions. Organizations must support these efforts by aligning culture, structure, and systems (e.g., performance management) with the values of openness and respect. When an organization's espoused values and actual practices both promote voice and learning (for example, celebrating lessons learned from failures), psychological safety becomes embedded and self-reinforcing at all levels.
4. **Practical strategies can effectively enhance psychological safety**, leading to better team outcomes. Interventions highlighted in the literature – from leadership training in inclusive behaviors to team charters on communication norms – have demonstrated positive results in increasing psychological safety (and subsequent performance) [2]. This indicates that psychological safety, while rooted in trust which takes time, can indeed be developed rather than being seen as a fixed trait of a team.

For management practice, these conclusions underline that investing in psychological safety is an investment in sustainable high performance. Teams with technically skilled members may falter if psychological safety is lacking; conversely, teams of moderate talent can outperform expectations if they have a strong safety net to leverage every member's contribution fully. Ideally, of course, an organization wants talented people *and* a safe environment – that combination is the hallmark of the most innovative, effective teams studied (e.g., at Google, Pixar, etc.).

From an academic perspective, this study contributes a literature-backed narrative that reinforces psychological safety's central place in organizational behavior theory and highlights areas for future research. Future studies could delve deeper into longitudinal effects (how psychological safety developed early in a team's life influences outcomes years later), cross-cultural validations of these concepts, and the interaction of psychological safety with virtual team dynamics (a growing practical concern in the era of remote work).

In closing, the core message is simple but powerful: teams perform best when people feel safe to be themselves and to speak up. Fostering psychological safety is not merely about making people feel good – it is about creating the conditions for teams to unleash their full potential, innovate, and tackle challenges head-on. Organizations that recognize and act on this will likely find their teams achieving the kind of high performance that provides a competitive edge in today's complex world.

In conclusion, psychological safety has been a cornerstone in my leadership journey. By fostering openness, inclusivity, and trust, I was

able to cultivate a culture where my team thrived, students benefited, and the institute remained adaptive to the evolving demands of the Guyanese technical and vocational education sector.

Conflict of Interest

The authors declare no conflict of interest. This research was conducted independently and received no external funding or influence that could bias the analysis or interpretations presented. The content is based solely on the reviewed literature and the authors' scholarly assessment.

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References

[1]. Bradley, B. H., Postlethwaite, B. E., Klotz, A. C., Hamdani, M. R., & Brown, K. G., 2012, Reaping the benefits of task conflict in teams: The critical role of psychological safety and team efficacy**.** *Journal of Applied Psychology, 97*(1), 151–158. Doi:10.1037/a0024200.

[2]. Carmeli, A., Reiter-Palmon, R., & Ziv, E., 2010, Inclusive leadership and employee involvement in creative tasks in the workplace: The mediating role of psychological safety**.** *Creativity Research Journal, 22*(3), 250–260. Doi:10.1080/10400419.2010.504654.

[3]. Castro, S., Englmaier, F., & Guadalupe, M., 2022, Fostering Psychological Safety in Teams: Evidence from an RCT. *SSRN Working Paper* (Posted July 2022). Available at SSRN: http://dx.doi.org/10.2139/ssrn.4141538

[4]. Delizonna, L., 2017, August 24, High-Performing Teams Need Psychological Safety: Here's How to Create It. *Harvard Business Review*. Retrieved from https://hbr.org/2017/08/high-performing-teams-need-psychological-safety-heres-how-to-create-it

[5]. Duhigg, C., 2016, February 25, What Google Learned from Its Quest to Build the Perfect Team**.** *The New York Times Magazine*. Retrieved from https://www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html

[6]. Edmondson, A., 1999, Psychological safety and learning behavior in work teams**.** *Administrative Science Quarterly, 44*(2), 350–383. Doi:10.2307/2666999.

[7]. Edmondson, A. C., 2019, The fearless organization: Creating psychological safety in the workplace for learning, innovation, and growth. *John Wiley & Sons*.

[8]. Edmondson, A. C., & Lei, Z., 2014, Psychological safety: The history, renaissance, and future of an interpersonal construct**.** *Annual Review of Organizational Psychology and Organizational Behavior, 1*(1), 23–43. Doi:10.1146/annurev-orgpsych-031413-091305.

[9]. Frazier, M. L., Fainshmidt, S., Klinger, R. L., Pezeshkan, A., & Vracheva, V., 2017, Psychological safety: A meta-analytic review and extension**.** *Personnel Psychology, 70*(1), 113–165. Doi:10.1111/peps.12183.

[10]. Hallam, K. T., Popovic, N., & Karimi, L., 2023, Identifying the Key Elements of Psychologically Safe Workplaces in Healthcare Settings**.** *Brain Sciences, 13*(10), 1450. Doi:10.3390/brainsci13101450.

[11]. Ip, E., Srivastava, R., Lentz, L., Jasinoski, S., & Anderson, G. S., 2025, Antecedents of Workplace Psychological Safety in Public Safety and Frontline Healthcare: A Scoping Review**.** *International Journal of Environmental Research and Public Health, 22*(6), 820. Doi:10.3390/ijerph22060820.

[12]. Jin, H., & Peng, Y., 2024, The impact of team psychological safety on employee innovative performance: A study with communication behavior as a mediator variable**.** *PLoS ONE, 19*(10), e0306629. Doi:10.1371/journal.pone.0306629.

[13]. Kahn, W. A., 1990, Psychological conditions of personal engagement and disengagement at work**.** *Academy of Management Journal, 33*(4), 692–724. Doi:10.2307/256287.

[14]. McKinsey & Company., 2022, What is psychological safety? *McKinsey Explainers*. Retrieved from McKinsey.com.

[15]. Nembhard, I. M., & Edmondson, A. C., 2006, Making it safe: The effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. *Journal of Organizational Behavior, 27*(7), 941–966. Doi:10.1002/job.413.

[16]. Newman, A., Donohue, R., & Eva, N., 2017, Psychological safety: A systematic review of the literature**.** *Human Resource Management Review, 27*(3), 521–535. Doi:10.1016/j.hrmr.2017.01.001.

[17]. Patil, R., Raheja, D. K., Nair, L., Deshpande, A., & Mittal, A., 2023, The Power of Psychological Safety: Investigating its Impact on Team Learning, Team Efficacy, and Team Productivity**.** *The Open Psychology Journal, 16*(1), Article e187435012307090. Doi:10.2174/18743501-v16-230727-2023-36.

[18]. Taylor, K., 2024, February 18, What does psychological safety mean, anyway? *Atlassian Teamwork Blog*. Retrieved from https://www.atlassian.com/blog/teamwork/what-does-psychological-safety-mean-anyway

[19]. Timothy R. Clark., 2020, The 4 Stages of Psychological Safety: Defining the Path to Inclusion and Innovation. *Berrett-Koehler Publishers*. (Discusses a framework for developing psychological safety in teams and organizations).

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Predicting Malaria Incidence in Guinea: A Real Time Machine Learning Tool

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Abstract

Malaria remains a pressing public health issue in Guinea, with approximately 13 million individuals at risk of contracting the disease. Despite efforts to reduce malaria incidence, it remains the leading cause of consultations, hospitalizations, and deaths in the country. To address this challenge, machine learning (ML) techniques have gained traction in epidemiology for predicting disease outbreaks and identifying high-risk areas. During this internship, we aim to use ensemble learning algorithms to develop a predictive model for malaria incidence in Guinea. Our methodology involved data integration, feature engineering, and model training using various ML algorithms, such as logistic regression, random forest, decision tree, support vector machine, gradient boosting machine, artificial neural network and ensemble stacking leveraging diverse datasets, including clinical records, demographic health surveys, and climatic data spanning six years from 2018 to 2023. We evaluated model performance using the F1-score metric. We found that the ensemble stacking method, particularly balanced stacking, demonstrated superior predictive accuracy (F1-score = 0.74). This highlights the importance of interdisciplinary collaboration and data integration in epidemiological research, as well as the potential of ML in informing targeted interventions and resource allocation strategies for malaria control. Challenges such as multicollinearity and imbalanced datasets were addressed through robust statistical techniques and model tuning. This research underscores the significance of translating research findings into actionable insights for malaria control efforts in Guinea. By harnessing the power of ML and deploying user-friendly tools, public health authorities can make informed decisions to mitigate the burden of malaria and improve health outcomes for affected populations.

Keywords: *Epidemiology, Guinea, Malaria, Machine learning, Predictive Modeling.*

Introduction

In Guinea, approximately 13 million people are at risk of contracting malaria, with 75% of the population estimated to be at risk according to the Ministry of Health. Malaria is the leading cause of consultations, hospitalizations, and deaths in the general population, with more than 1.5 million cases reported in 2018 [1]. Between 2017 and 2020, the number of malaria cases fell by 9.7%, from 354 to 320 per 1,000 inhabitants at risk nationwide, although the number of deaths rose by 1.6%, from 0.77 to 0.78 per 1,000 inhabitants at risk. The primary vector of transmission is the female Anopheles gambiae mosquito, which has a significant economic burden on the country, leading to decreased productivity and a loss of gross domestic product (GDP). The World Health Organization (WHO) estimates that between 2008 and 2015, malaria control interventions in

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Guinea prevented 1.3 million deaths and 4.6 million clinical cases [2].

Machine learning (ML) is becoming increasingly popular in the field of epidemiology for identifying factors that are associated with the incidence of infectious diseases and predicting their outbreaks. Ensemble learning is an ML algorithm that has been used to pinpoint areas with a high risk of malaria incidence and to determine the contextual factors associated with this risk. However, this research has not fully explored all possible prediction models, making it difficult to establish the most reliable stacking algorithm [3, 4]. Studies have further revealed that these methods can be used to detect spatial clusters of high malaria incidence and to recognize environmental and socioeconomic components that are associated with these clusters. Additionally, they are capable of revealing temporal patterns of malaria incidence and forecasting future incidence trends [4-6]. Although malaria-specific data-driven models are limited due to a lack of structured datasets [7-9], some predictive models for malaria incidence have been created in several West African countries, mostly using climatic features such as relative humidity, rainfall and temperature [10-13]. However, other powerful and versatile ML algorithms, such as the CART, random forest, GBM, SVM and ANN algorithms, could be used to develop a strong and accurate predictive model for the incidence of malaria, taking advantage of each algorithm's unique strengths and ability to capture complex nonlinear patterns in the data.

To reduce the burden of the disease, it is essential to understand the contextual factors that influence its incidence. In addition to climatic factors affecting the intensity, seasonality and geographical distribution of malaria transmission, vector, sociodemographic and economic parameters need to be taken into account to prevent malaria epidemics [14-18]. In addition, the ownership and use of insecticide-treated mosquito nets, combined with access to health care and clean water, are essential for reducing malaria cases [19-22]. In addition, the ownership and use of insecticide-treated mosquito nets, combined with access to health care and clean water, are essential for reducing malaria cases [23-27]. The aim of this work was to predict the incidence of malaria in Guinea at the national level by considering climatic, clinical and demographic factors. More specifically, we aimed to identify factors that are correlated with the incidence of malaria in Guinea, to build a machine learning model that predicts malaria incidence at the national level and to create a web application for malaria incidence prediction.

Materials and Methods

Our data processing journey commenced with the collection and extraction of six years of diverse data from clinical and demographic health surveys and climatic records, focusing on variables such as malaria cases, mosquito net availability, population demographics, well-being indices, and climatic factors. Following this, the data underwent transformation and integration, ensuring standardized formats, coherence, and consistency across all datasets. Thorough quality assurance checks were conducted to validate the accuracy, completeness, and consistency, and the integrated dataset was explored to discern variable relationships and distribution characteristics. Relevant features were selected for machine learning analysis, including independent variables such as population, temperature, humidity, precipitation and rainfall, with subsequent splitting of the dataset for training and testing, coupled with preprocessing for model readiness. Machine learning models were developed using the prepared dataset to predict malaria incidence, their performance was evaluated, and iterations were made as needed to optimize predictive accuracy. Figures 1 and

2 summarize the data processing and machine learning flow, respectively.

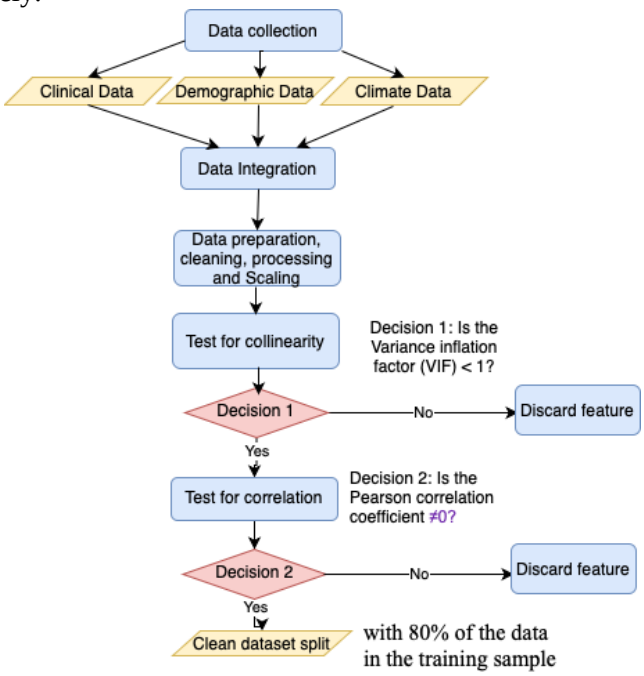

Figure 1. Data processing flow

Data Collection

Our dataset comprises six years of continuous recording and originates from three distinct databases:

1. **Clinical data:** Malaria cases were sourced from the routine DHIS2, the national repository for data on malaria cases and other priority diseases in Guinea. These data were collected at the health facility level and recorded monthly in the DHIS2 across all 38 health districts in the country.
2. **Demographic health survey data:** Information regarding the availability of mosquito bed nets, total population, and socioeconomic well-being index was collected every three years at the national level.
3. **Climatic data:** Monthly average temperature, pressure, precipitation, and humidity values were collected in each of Guinea's eight administrative regions and stored in the national DHIS2 data warehouse.

We have integrated these three data sources into a unified dataset comprising seven variables and 2,736 observations spanning from 2018 to 2023:

1. Features:
   i. Total population
   ii. Temperature
   iii. Rainfall
   iv. Humidity
   v. Number of mosquito nets
   vi. Well-being index
   vii. Number of malaria cases
2. Target variable: Malaria incidence (quantitative variable).

Data Integration and Processing

In the data processing pipeline, the initial phase involves data discovery, where the structure, format, and variables of each dataset are identified and understood. Following this, data extraction was carried out using appropriate methods to ensure representativeness and relevance. Subsequently, the data underwent transformation, including standardization, merging, cleaning, and enrichment, to prepare

them for analysis. Once transformed, the dataset was loaded into a CSV format, which was ready for exploratory data analysis and our machine learning application steps. Quality assurance measures were then implemented to validate accuracy, completeness, and consistency, addressing any identified issues. Data governance policies were applied to maintain security, privacy, and compliance, with access controls defined to safeguard sensitive information. Finally, procedures for ongoing maintenance and monitoring were established to ensure that the dataset remains accurate, up-to-date, and free from errors or anomalies, with regular updates from source systems and proactive monitoring of data pipelines.

Exploratory Data Analysis (EDA)

We conducted a thorough exploratory data analysis (EDA) to understand the relationships between our features and the target variable, starting with scatter plots and line plots to provide insights into which features might be most relevant. We used a test for collinearity (variance inflation factor (VIF)) to identify predictors that had high collinearity. VIF values close to 1 indicate low multicollinearity, suggesting that the variance of the regression coefficient for that feature is not significantly inflated due to correlations with other features. We removed all variables with a VIF above 5 or 10 since they were considered high and indicated that multicollinearity may be a problem. We used Pearson's correlation test to assess the relationships between our feature variables and target variables. Pearson's correlation coefficient lies between -1 and +1, where -1 indicates a negative correlation, 0 indicates no correlation, and 1 signifies a strong positive correlation.

The monthly malaria incidence rate, defined as the number of confirmed malaria cases per 1000 inhabitants in the general population reported in a month, was determined and adjusted by considering the rates of confirmation of biological test diagnosis and attendance at health facilities for each health district. We used the crude incidence that was determined by reporting the cases of malaria confirmed by biological tests per 1000 inhabitants in the general population following this calculation algorithm:

The malaria incidence rate was calculated as the number of new cases/total population × 1000 person-months.

where:

Number of New Cases = Number of individuals who developed malaria in a given month registered at the health center.

Total Population = Total number of individuals living in the given area in the same month.

We will classify malaria incidence using the four WHO standard malaria incidence classes [14] as follows:

1. Very low malaria transmission zone: incidence less than 100 cases per 1000 people;
2. Low malaria transmission zone: incidence between 100 and 250 cases per 1000 people;
3. Moderate malaria transmission zone: incidence between 250 and 450 cases per 1000 people;
4. High malaria transmission zone: incidence greater than 450 cases per 1000 people.

Feature Engineering

This step is critical for enhancing model performance and involves creating new features from existing features to better capture the underlying patterns in our data. The following steps were performed:

1. **Encode the Target Variable:** Since our newly created variable 'Class' was categorical, to ensure that it was in a format suitable for machine learning algorithms, we converted these categories into numerical codes: Very low = 0, Medium = 1, Medium = 2, and High = 3.

2. **Standardization/Normalization of Numerical Features:** Since our features were likely on different scales (temperature vs. pressure), we found it beneficial to normalize (scale them to a range between 0 and 1). This is particularly important for models such as support vector machines (SVMs) and can also help with gradient descent convergence in neural networks.
3. **Creating interaction terms:** Sometimes, the interaction between two or more features can have a significant impact on the target variable. For example, high temperature combined with high humidity might have a different effect on the 'Class' than each feature individually.
4. **Polynomial Features:** Generating polynomial and interaction features can uncover relationships between features that can help improve model performance.
5. **Missing Values:** If any of the features have missing values, we will need to decide whether to fill them (imputation), remove the rows with missing values, or even use the presence of missing values as a feature itself. Our pipeline performs simple imputation by imputing any missing values.
6. **Feature Selection:** After adding polynomial features, the dimensionality of our data increases, and not all features might be useful for predicting our target variable. We used recursive feature elimination (RFE) to select the most important features.

Model Training and Tuning

After preprocessing, we split our data into training and testing sets. The training set of 80% of our process dataset and testing set (20%) will contain the scaled original features, their polynomial transformations, and the interaction terms, which are ready to be used for training machine learning models.

To find the optimal hyperparameters for a given model to maximize its performance, we used “grid search and cross validation”, a popular method for hyperparameter tuning in Python's scikit-learn library, which performs an exhaustive search over a specified parameter grid and returns the best parameters.

Since our “Class” variable was imbalanced, we trained our models with both imbalanced and balanced approaches. Then, we compared all two approaches together to select the best model to be used in our application as a predictive model. The modeling, evaluation and selection stages are described in detail in the following figure below (Figure 2).

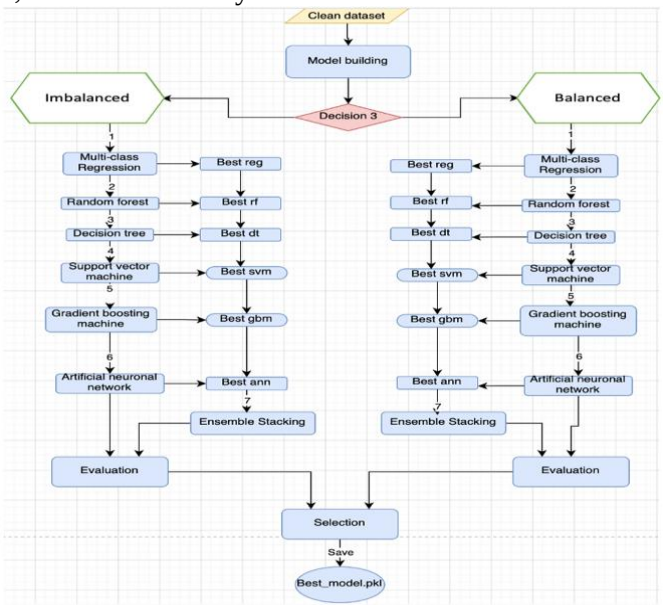

Figure 2. Machine Learning Building, Evaluation and Selection Process Flow

Multiclass logistic regression: Through our regression pipeline, we perform hyperparameter tuning for a logistic regression classifier using grid search cross-validation, where parameter "C" is equal to a list of options for the regularization strength, with the values (0.1, 1, 10, 100) representing how strongly our model tries to avoid fitting to noise by penalizing large coefficients. Smaller values specify stronger regularization and parameter "solver", a list of algorithms that the logistic regression model uses for optimization with a list of values equal to newton-cg, lbfgs, liblinear, sag, and saga. We first define a parameter grid containing values for regularization strength and solver algorithms. Then, we initialize a logistic regression classifier with specified parameters. Next, grid search cross validation was initialized with the classifier, parameter grid, and cross-validation settings. It uses cross-validation (cv=5) to assess the performance of each parameter combination, ensuring that the chosen parameters generalize well to unseen data, Verbose = 1 means that the search process will print out progress messages, and n_jobs = -1 allows the process to use all available CPU cores for faster completion. A grid search was then conducted on the training data to find the best combination of hyperparameters (Figure 3).

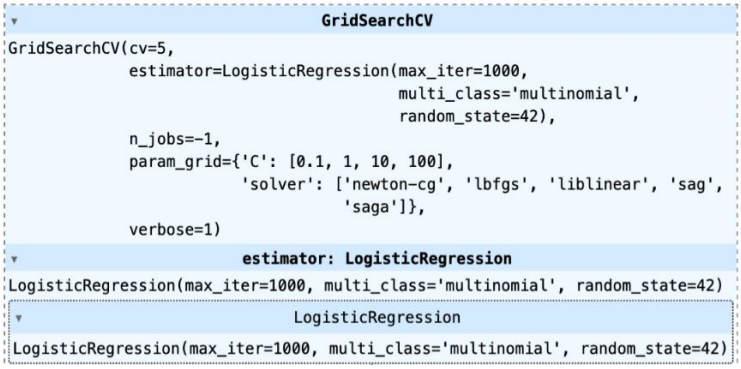

Figure 3. Regression Pipeline Flow

Random Forest: Through this pipeline, we conducted hyperparameter tuning for a random forest classifier via grid search cross-validation. Initially, a random forest classifier was instantiated with a specified random state. Then, a parameter grid was defined, encompassing values for key hyperparameters such as the number of trees in the forest (n_estimators), maximum depth of trees (max_depth), minimum samples required to split an internal node (min_samples_split), minimum samples required to be at a leaf node (min_samples_leaf), and whether bootstrap samples are used during tree construction (bootstrap). Subsequently, grid search CV was utilized to explore various combinations of these hyperparameters, utilizing a 3-fold cross-validation scheme and assessing performance based on the F1 macro-score (Figure 4).

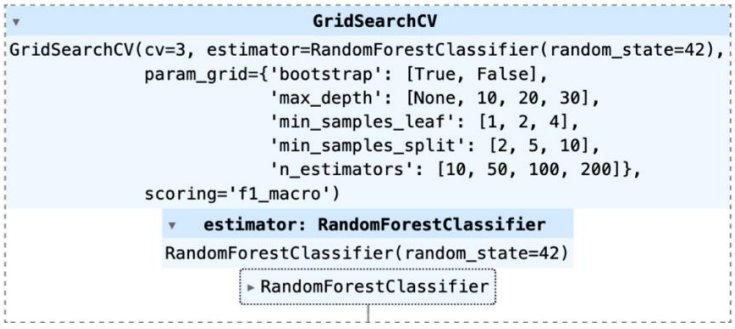

Figure 4. RF Pipeline Flow

Decision Tree: For this pipeline, we conducted hyperparameter tuning for a decision tree classifier through grid search cross-validation. Initially, a decision tree classifier was instantiated with a specified random state. Then, a parameter grid was defined, including key hyperparameters such as the maximum depth of the tree (max_depth), minimum samples required to split an internal node (min_samples_split), minimum samples required to be at a leaf node (min_samples_leaf), and the criterion for quality measurement of a split (criterion). Subsequently, Grid Search CV was employed to explore various combinations of these hyperparameters, utilizing a 3-fold cross-validation scheme and assessing performance based on the F1 macro score. The grid search is fitted to the prepared training data, and the best-performing decision tree model is extracted from the grid search results and stored in best_dt for subsequent utilization (Figure 5).

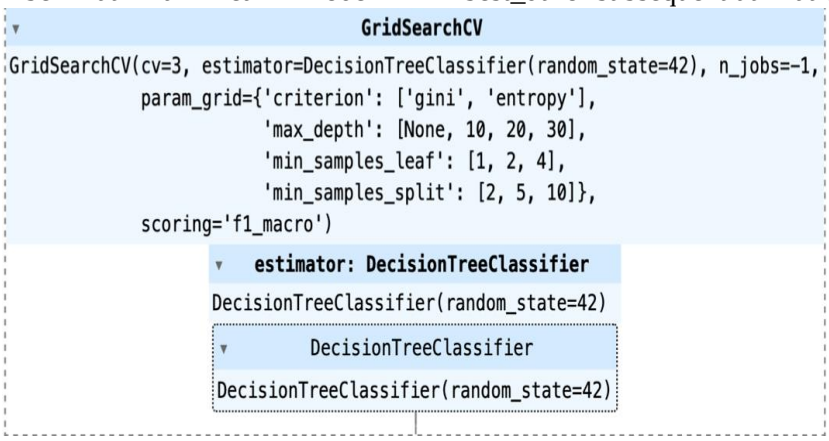

Figure 5. Decision Tree Pipeline Flow

Support Vector Machine: This pipeline conducts hyperparameter tuning for a support vector machine (SVM) classifier using grid search cross-validation. Initially, a parameter grid was defined, encompassing values for key hyperparameters such as the regularization parameter (C), kernel coefficient for 'rbf', 'poly', and 'sigmoid' kernels (gamma), and the kernel type to be used in the algorithm (kernel). Then, an SVM model is initialized with the specified parameters, including enabling probability estimates and setting a random state. Grid search CV is utilized to explore various combinations of these hyperparameters, employing a 5-fold cross-validation scheme and parallel processing for efficiency. The grid search was fitted to the prepared training data, and the best-performing SVM model was extracted from the grid search results and stored in best_svm for subsequent use (Figure 6).

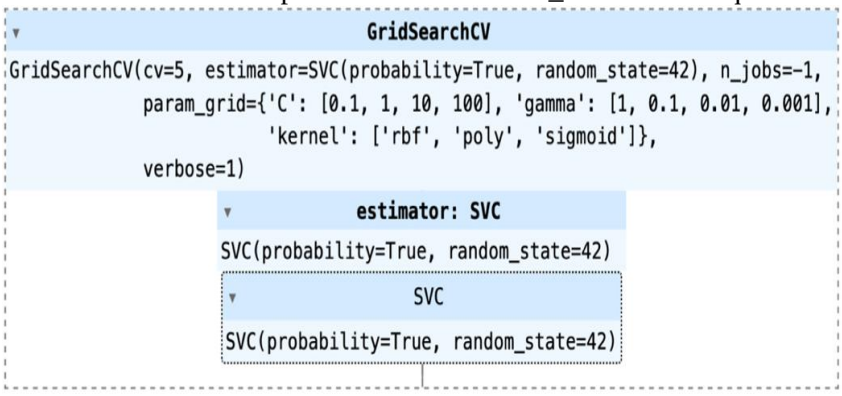

Figure 6. Support Vector Pipeline Flow

Gradient Boosting Machine: This pipeline performs hyperparameter tuning for a gradient boosting classifier via grid search cross-validation. Initially, a parameter grid was defined, which includes values for key hyperparameters such as the number of boosting stages (n_estimators), the learning rate that controls the contribution of each tree (learning_rate), and the maximum depth of the individual regression estimators (max_depth). Then, a gradient boosting classifier was initialized with the specified parameters, including setting a random state. GridSearchCV is utilized to explore various combinations of these hyperparameters, employing a 5-fold cross-validation scheme and parallel processing for efficiency. The grid search was fitted to the prepared training data, and the best-performing gradient boosting model was extracted from the grid search results and stored in best_gbm for subsequent use (Figure 7).

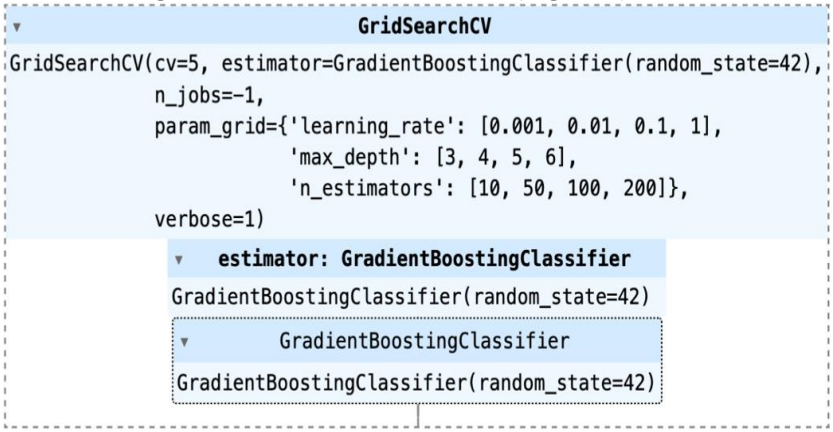

Figure 7. Gradient Boosting Pipeline Flow

Artificial Neuronal Network: This pipeline conducts hyperparameter tuning for a multilayer perceptron (MLP) classifier using grid search cross-validation. Initially, a parameter grid was defined, encompassing values for key hyperparameters such as the size of the hidden layers (hidden_layer_sizes), activation functions for the hidden layers (activation), and the initial learning rate (learning_rate_init). Then, an MLP classifier was initialized with specified parameters, including setting a random state and increasing the maximum number of iterations for better convergence. Grid search CV was employed to explore various combinations of these hyperparameters, utilizing a 5-fold cross-validation scheme and parallel processing for efficiency. The grid search was fitted to the prepared training data, and the best-performing MLP model was extracted from the grid search results and stored in best_NN for subsequent utilization (Figure 8).

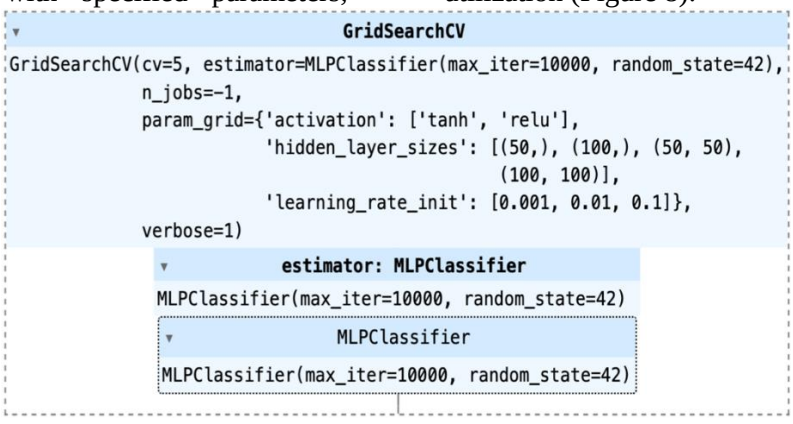

Figure 8. Artificial Neural Network pipeline Flow

Stacking Model: This pipeline implements a stacking ensemble classifier, which combines predictions from multiple base models using a meta-learner. Initially, a list of base models was retrieved from the previous models, and the corresponding best-performing model was obtained from previous hyperparameter tuning. Then, a meta-learner, in this case, a logistic regression classifier, was defined. Subsequently, a stacking classifier was instantiated with the list of best base models, the meta-learner, and additional parameters such as the number of folds for cross-validation (cv=5) and the method used for stacking (stack_method='auto'). The stacking classifier was fitted to the prepared training data, combining predictions from the best base models and training the meta-learner on these predictions. Finally, the best estimator was extracted from the stacking classifier, representing the entire stacked ensemble model (Figure 9).

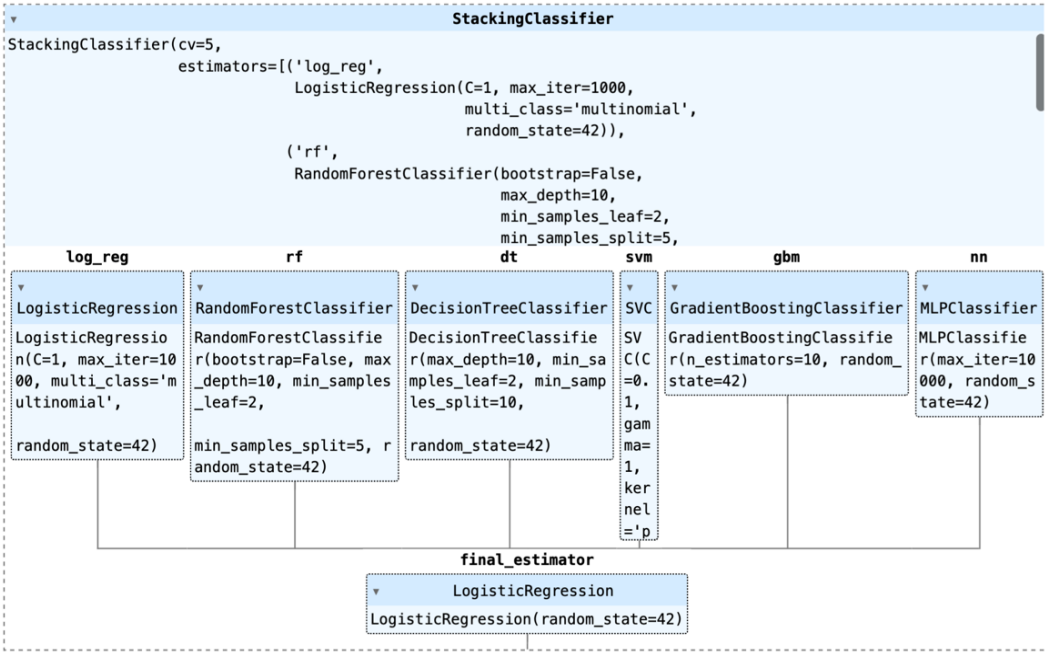

Figure 9. Stacking pipeline flow

All these steps were repeated with a balanced approach by setting the "class_weight" parameter to 'balanced' (Figure 10). This automatically adjusts the weights inversely proportional to the class frequencies. The two approaches, balanced and unbalanced, were evaluated and compared with each other to extract the best model.

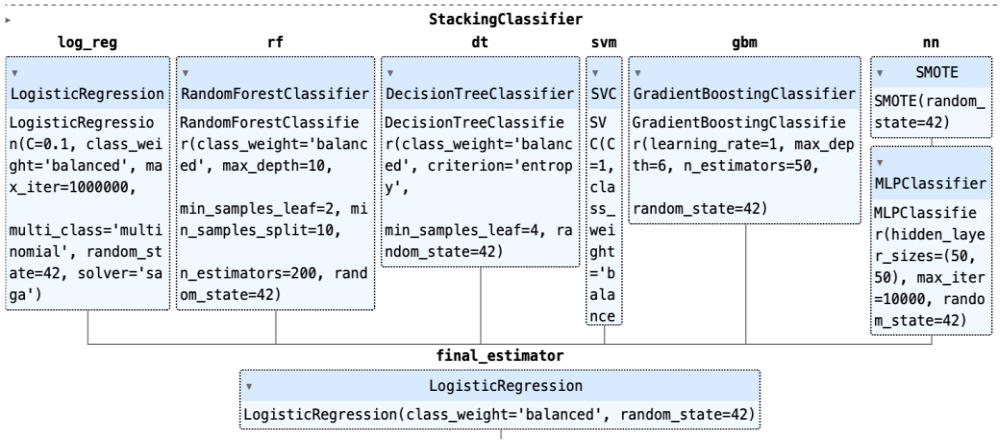

Figure 10. Balanced Stacking Pipeline Flow

Model Evaluation and Selection

Model performance was evaluated using the F1-score, a harmonic mean of precision and recall, providing a balance between the two metrics. This choice is particularly relevant for imbalanced datasets or when the cost of false positives and false negatives is high.

1. **F1-Score Calculation:** The F1-score was calculated for each model to assess its performance following this formula:
    - F1-score = 2 * (precision * recall) / (precision + recall).
2. **Comparison and Selection:** The models' F1-scores were compared, and the model with the highest F1-score was selected as the best performing model.

Model Deployment

To ensure that we have correctly collected the needs of our future end users, we have adopted the formalism of the Unify Modeling Language (UML)[1] standards to model the static and dynamic views of our future application.

This use case diagram depicts the interactions between users (actors) and a system to predict a given region (Figure 11):

1. The actor here is any authorized user from the NMCP who has access to the system.
2. The use case is “Predict Malaria incidence”.
3. The relationships show how actors interact with these use cases, such as "Users", which are associated with "Predict Malaria incidence" and "Report sharing".
4. The relationships show that "predict" includes the functionality of "manually inputting data".
5. Extended relationships show that "predicts" can be extended to include "shared reports" under certain conditions.

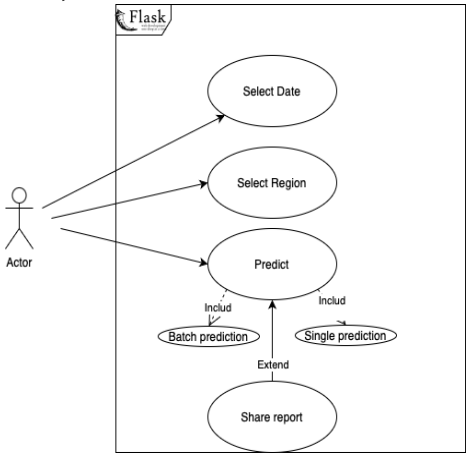

Figure 11. Prediction Use Case

Figure 12 shows the interactions between DHIS2 and our Flask application during the prediction process. It shows the sequence of events starting from when the user submits a prediction request through the Flask web interface, triggering a request to the Flask server. The server then interacts with the prediction algorithm to process the input data and generate a prediction. This sequence is represented by messages exchanged between the client (user interface) and the server, as well as between the server and the prediction algorithm. Additional interactions include data validation, error handling during processing, and response delivery back to the user interface. The sequence diagram provides a detailed view of how different parts of the application collaborate to perform the prediction task, aiding in understanding the system's behavior and potential optimizations.

[1] https://en.wikipedia.org/wiki/Unified_Modeling_Language#:~:text=The%20unified%20modeling%20language%20(UML,the%20design%20of%20a%20system.

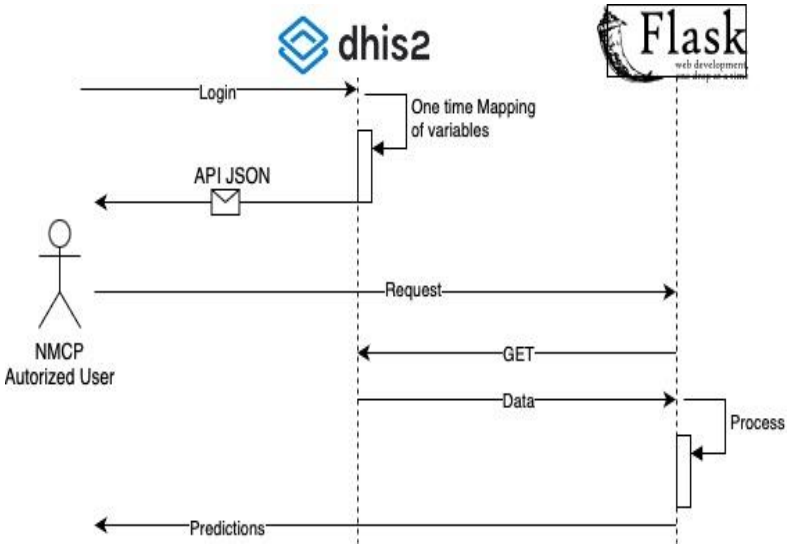

Figure 12. Application Sequence Diagram

This state-transition diagram (Figure 13) includes "user logging," "data processing," and "prediction display," representing different stages of our tool's functionality. Transitions depict how the tool moves between these states, triggered by events such as user submission of request of data, processing, and display of the malaria prediction result. The initial state signifies the starting point when the user accesses the tool, while the final state represents the conclusion of the prediction process. Internal transitions occur during data processing, indicating intermediate steps within a single state. Overall, this state diagram offers a clear visualization of the tool's behavior and flow, aiding in the understanding and development of malaria prediction applications.

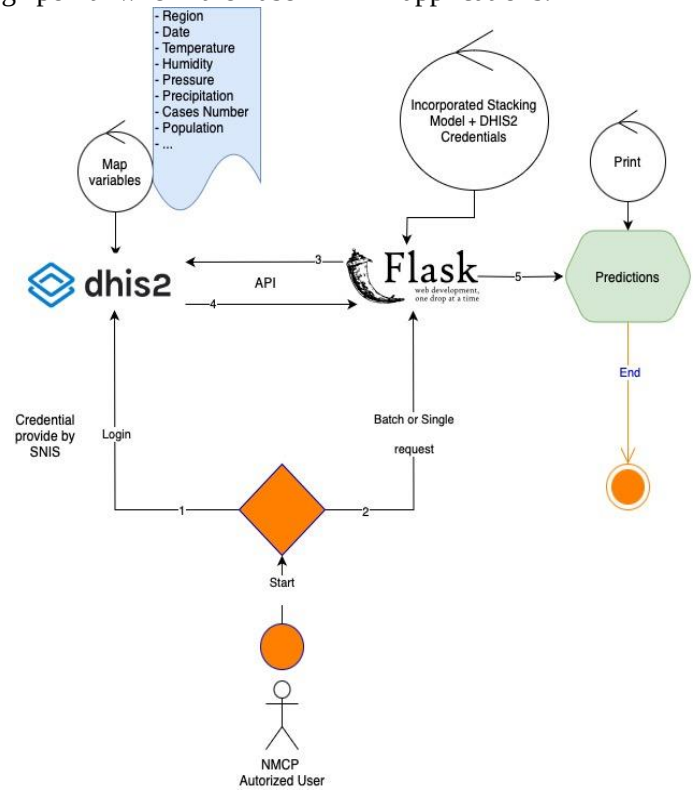

Figure 13. Application state-transition diagram

Results

Descriptive Analysis

Overall, we find an increasing trend in the mean incidence across most regions from 2018 to 2023. This is evident from the higher mean incidence values in later years compared to earlier years for many regions (Figure 14).

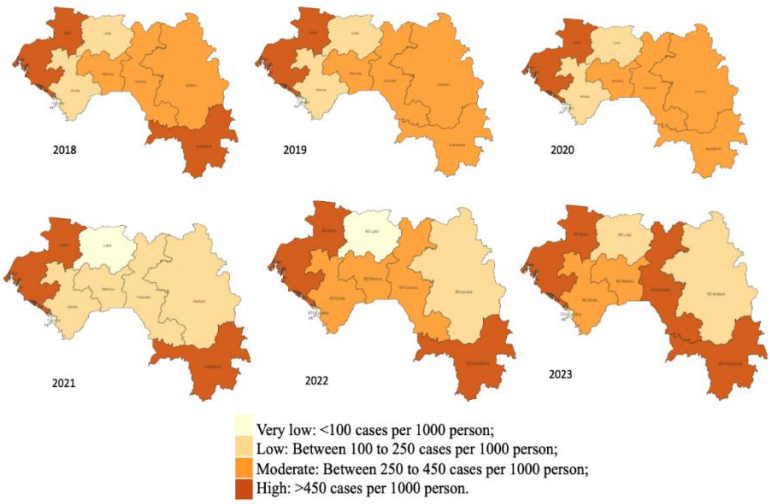

Figure 14. Annual Incidence per 1000 Population by Region between 2018 and 2023 in Guinea2

Variance Inflation Factor

The variance inflation factor (VIF) measures how much the variance of an estimated regression coefficient increases if the predictors are correlated. The table below (Table 1) summarizes our main findings.

Table 1. Variance Inflation Factor

Features	**VIF**
constant	14.55
Temperature	2.67
Humidity	2.02
Pressure	2.24
Precipitation	1.66
Incidence	1.11
Number of mosquito beds nets	8.34
Well-being index	11.22

The constant term had a high VIF (14.55), suggesting multicollinearity issues. The temperature, humidity, pressure, precipitation and incidence have relatively low VIF values, indicating low multicollinearity among them. The VIF for "number of mosquito bed nets" was 8.34, which indicates moderate multicollinearity. Although not extremely high, this suggests that the variance of its regression coefficient may be somewhat inflated due to correlations with other predictors.

The VIF for the "well-being index" is 11.22, which is higher and suggests stronger multicollinearity compared to the other features. This indicates that the variance of its regression coefficient is significantly inflated due to correlations with other predictors.

[2] https://portail.sante.gov.gn/base-connaissances/snis-section/

Correlation Matrix

These results (Table 2) provide insight into the relationships between all our variables. We focus her on the correlation between incidence and all features. The incidence had weak positive correlations with humidity (0.30) (Figure 15B), pressure (0.20) (Figure 15D), and precipitation (0.14) (Figure 15C), indicating a slight tendency for the incidence to increase as humidity, pressure and precipitation increase. There is a very weak negative correlation with temperature (-0.24) (Figure 15A), suggesting a slight tendency for the incidence to decrease as temperature increases.

Table 2. Correlation Matrix

	Temperature	**Humidity**	**Pressure**	**Precipitation**	**Incidence**
Temperature	1.000000	-0.610601	-0.733448	-0.541672	-0.238186
Humidity		1.000000	0.546362	0.585471	0.304338
Pressure			1.000000	0.425031	0.204627
Precipitation				1.000000	0.141541
Incidence					1.000000

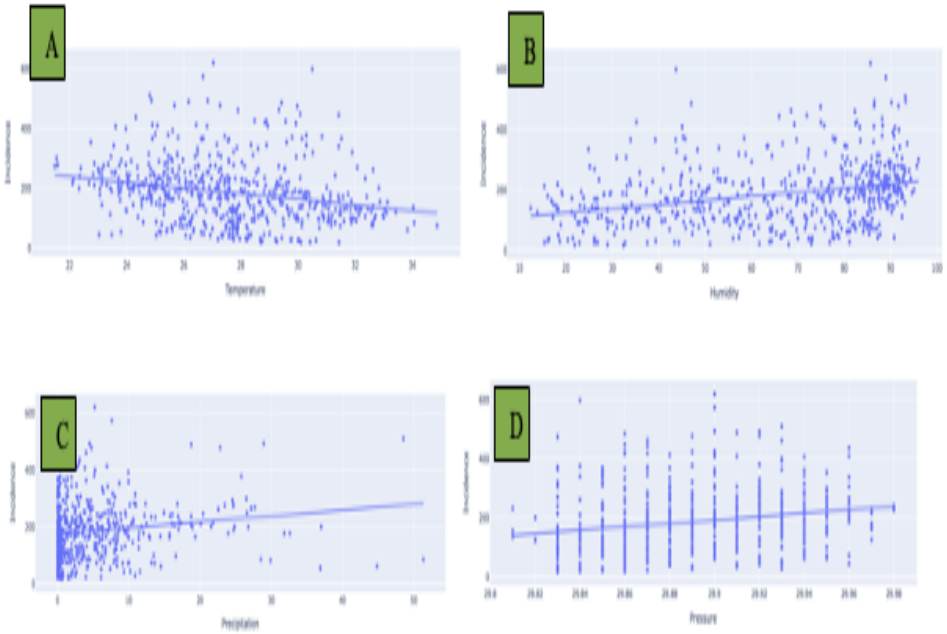

Figure 15. Scatterplots of Incidence vs Feature

Our final dataset consists of 576 records for temperature (°C), humidity (%), pressure (kph), precipitation (mm), and incidence (expressed per 1000 people). The mean values indicate an average temperature of 27.52°C, humidity of 64.86%, pressure of 29.89 kph, precipitation of 4.70 mm, and an incidence of 185.43 per 1000 people. The standard deviations reveal the variability within the dataset, with the temperature showing a deviation of 2.63°C, humidity at 22.95%, pressure with a minimal deviation of 0.04 kph, precipitation exhibiting a deviation of 7.17 mm, and incidence displaying a deviation of 104.26 per 1000 people (Figure 16).

Measure	Numbers of records	Mean	Standard Deviation
Temperature (°C)	576	27.52	2.63
Humidity (%)	576	64.86	22.95
Pressure (kph)	576	29.89	0.04
Precipitation (mm)	576	4.7	7.17
Incidence (per 1000 population)	576	185.43	104.26

Figure 16. Descriptive Statistics

Following the stratification of our incidence into four categories (very low, low, medium and high), Figure 17 provides an overview of the frequency of malaria incidence levels within the dataset. This suggests that the majority of instances have either "Low" (323 instances) or "Very Low" (129 instances) malaria incidence, with fewer instances classified as "Moderate" (111 instances) and even fewer instances classified as "High" (13 instances) malaria incidence.

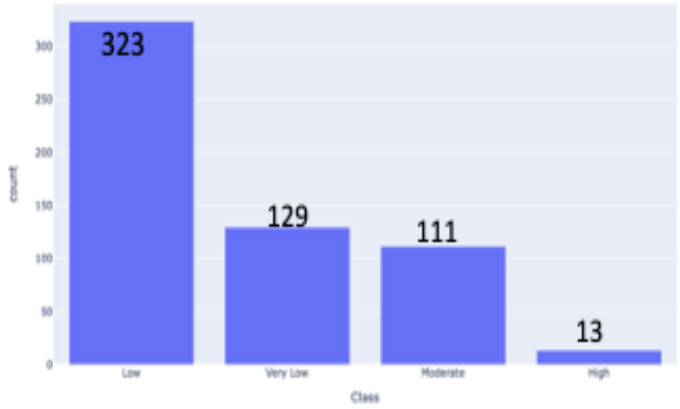

Figure 17. Counts of Cases in each Class

Machine Learning Models

The best estimator, representing the logistic regression model with optimal hyperparameters, was the one with a strength C = 1. The best-performing random forest was the one with bootstrap = False, max_depth = 10, min_samples_leaf = 2, and min_samples_split=5. For the decision tree, our best parameters were max_depth=10, min_samples_leaf=2, and min_samples_split=10. For gradient boosting, we find that n_estimator = 10 is the best parameter. With a support vector machine, we found that the best parameters were C = 0.1, gamma = 1, kernel = 'poly', and probability = True. The model with the default parameter was found to be the best among all the neuronal networks.

Among our models (Table 3 and Figure 18), the balanced stacking model achieved the highest F1-score (0.74), indicating superior overall performance in our classification tasks. The balanced random forest and balanced support vector machine models also performed very well, with F1-scores close to those of the balanced stacking models (0.63 and 0.61, respectively). Although not as high as the balanced stacking model, the unbalanced stacking model still performed well, indicating the effectiveness of the ensemble methods (0.58). The balanced decision tree model performed slightly better than its unbalanced counterpart, indicating that balancing the dataset improved its performance (0.56).

Unbalanced models generally fall below their balanced counterparts. However, some unbalanced models, such as decision tree (dt), random forest (rf), and support vector machine (SVM), still achieved moderate F1-scores. The balanced neural network (0.47), balanced gradient boosting machine (0.44), and balanced logistic regression (0.43) achieved moderate F1-scores, indicating reasonable performance but not as high as that of the top performers. The neural network (0.37), gradient boosting machine (0.34), and logistic regression (0.23) models achieved lower F1-scores, suggesting that they may require further tuning or may not be suitable for this particular dataset.

Table 3. Model comparison

Models	**F1-score**
balanced_stacking	0.74
balanced_rf	0.63
balanced_svm	0.61
stacking	0.58
balanced_dt	0.56
dt	0.54
balanced_NN	0.47
balanced_gbm	0.44
rf	0.43
balanced_log_reg	0.43
svm	0.41
NN	0.37
gbm	0.34
log_reg	0.23

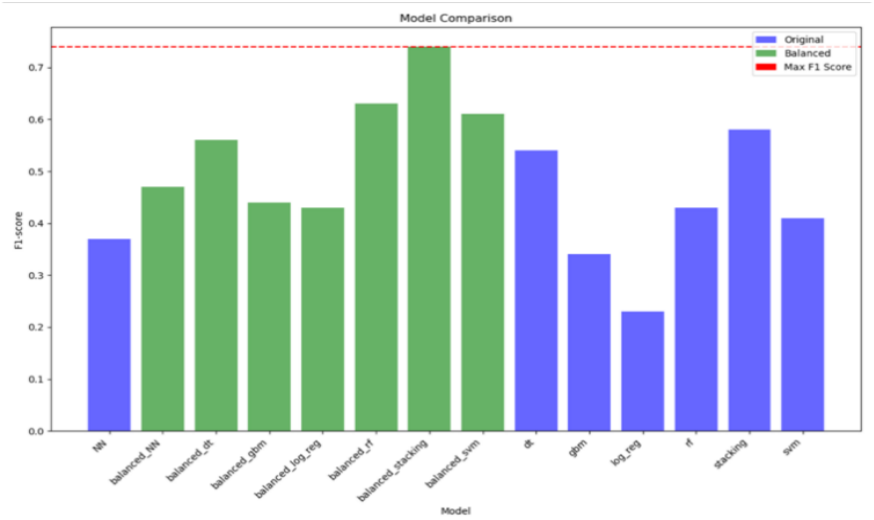

Figure 18. Model Comparison

Web Application

The web application developed (Figure 19, 20 and 21) in this study serves as a user-friendly tool for predicting malaria incidence in Guinea. Building upon the insights gained from machine learning models trained on diverse datasets, including clinical, demographic, and climatic data, the application provides a platform for public health authorities to access predictive insights and make informed decisions.

The application interface is intuitive and easy to navigate and is designed to accommodate users with varying levels of technical expertise. Users can input relevant parameters such as temperature, humidity, pressure and precipitation. The application utilizes advanced algorithms to process input data and generate accurate forecasts, helping stakeholders identify high-risk areas and allocate resources effectively. Additionally, the application offers visualization capabilities, allowing users to explore Guinea maps and interact to select specific regions.

Overall, the web application represents a valuable tool for enhancing malaria surveillance and control efforts in Guinea. By democratizing access to predictive analytics, the application empowers public health authorities to proactively address malaria transmission and improve health outcomes for communities across the country.

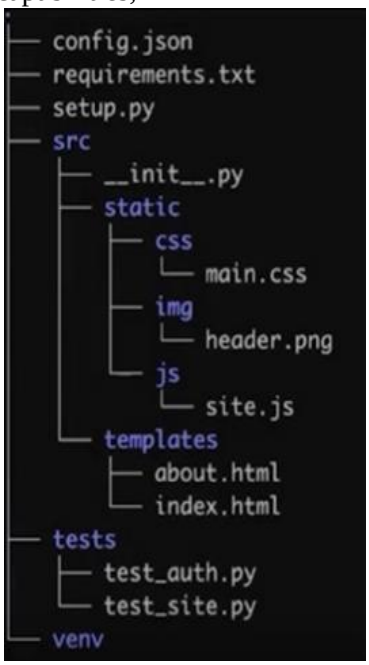

Figure 19. Flask Application Structure

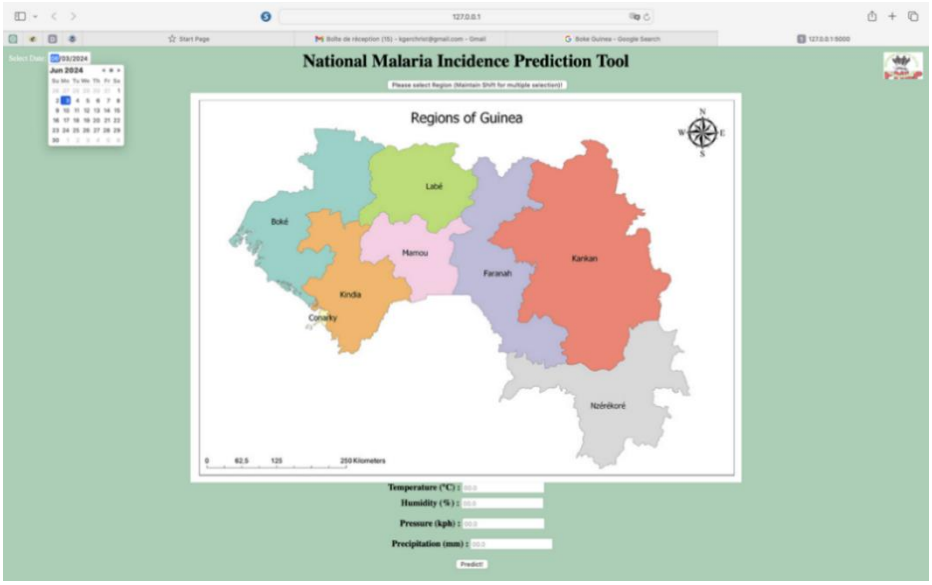

Figure 20. Application Interface

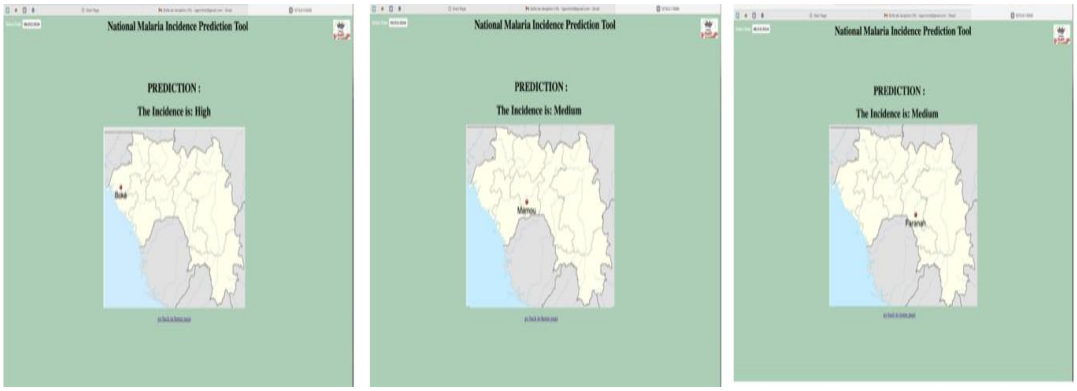

Figure 21. Prediction Outputs for the Boke, Mamou and Faranah Regions

Discussion

The present internship contributes to understanding the dynamics of malaria in Guinea and demonstrates the potential of machine learning in predicting disease incidence. By integrating diverse data sources, including clinical, demographic, and climatic data, this study aimed to predict malaria incidence at the national level. The results indicate promising avenues for leveraging machine learning techniques to improve malaria control strategies.

In machine learning, especially in classification tasks, the distribution of classes in the dataset might be imbalanced, meaning that some classes have significantly more instances than others. This class imbalance can lead to biased models that favor the majority class, often resulting in poor performance for the minority classes. The scikit-learn[3] "balanced" mode automatically adjusts the weights to be inversely proportional to the class frequencies in the input data. It internally calculates the class weights based on the class distribution in the training data and assigns higher weights to minority classes and lower weights to majority classes. During the training of the model, these class weights are incorporated into the algorithm's objective function (such as the loss function). This means that errors on the minority classes are penalized more heavily during training, effectively making the model more sensitive to minority class instances. By adjusting the class weights, the model is encouraged to pay more attention to minority classes, potentially improving its ability to correctly classify these instances. This approach is particularly useful when the dataset is highly imbalanced.

One key finding of the study is the identification of factors correlated with malaria incidence. Through exploratory data analysis, the study revealed relationships between climatic variables such as temperature, humidity, pressure and precipitation. These insights underscore the complex interplay between environmental, demographic, and health-related factors in malaria transmission, highlighting the importance of multifaceted interventions in malaria control efforts.

Our study employed various machine learning algorithms, including logistic regression, random forest, decision trees, support vector machines, gradient boosting machines, neural networks, and stacking models, to predict malaria incidence. Among these, the balanced stacking model emerged as the top performer, achieving the highest F1-score (0.74). This underscores the effectiveness of ensemble methods in capturing the complex patterns inherent in malaria transmission dynamics. However, it is worth noting that model performance varies across different algorithms, indicating the importance of selecting appropriate techniques based on dataset characteristics and the problem domain.

[3] https://scikit-learn.org/stable/

Furthermore, this study addresses practical considerations in deploying predictive models for malaria incidence prediction. By developing a user-friendly web application, our internship aims to facilitate the utilization of predictive insights by public health authorities. This underscores the importance of translating research findings into actionable tools that can inform decision-making and resource allocation in real-world settings.

In conclusion, this study highlights the potential of machine learning in malaria epidemiology and underscores the importance of interdisciplinary collaborations among researchers, healthcare practitioners, and policymakers in addressing public health challenges. By harnessing the power of data-driven approaches, we can continue to advance our understanding of malaria dynamics and improve intervention strategies for malaria elimination.

Conclusion

In conclusion, our internship provides valuable insights into the epidemiology of malaria in Guinea and demonstrates the potential of machine learning in predicting and understanding disease dynamics. Despite progress in reducing malaria cases, the disease remains a significant public health concern, with substantial morbidity and mortality rates.

The integration of diverse data sources and the application of advanced machine learning algorithms have enabled the development of predictive models for malaria incidence, with ensemble methods showing promising results. However, challenges such as multicollinearity and imbalanced datasets underscore the need for careful data preprocessing and model tuning to ensure robust and accurate predictions.

Moving forward, the findings from this internship can inform targeted interventions and resource allocation strategies to reduce the burden of malaria in Guinea. By leveraging predictive models and deploying user-friendly tools, public health authorities can improve decision-making and allocate resources more efficiently to areas at highest risk of malaria transmission.

Moreover, ongoing collaboration between Guinean researchers, healthcare practitioners, and policymakers is essential for advancing malaria research and implementing evidence-based interventions. By harnessing the power of data and machine learning, we can continue to make progress toward malaria elimination and improve health outcomes for communities in Guinea and beyond.

Conflict of Interest

The author declares that there is no conflict of interest.

References

[1]. President's Malaria Initiative (PMI). 2023, *Guinea Malaria Operational Plan FY 2023*. https://d1u4sg1s9ptc4z.cloudfront.net/uploads/2023/01/FY-2023-Guinea-MOP.pdf

[2]. World Health Organization (WHO). 2020, *Malaria in the African Region*. https://www.afro.who.int/health-topics/malaria

[3]. Hamilton, A. J., Strauss, A. T., Martinez, D. A., et al., 2021, Machine learning and artificial intelligence: Applications in healthcare epidemiology. *Antimicrobial Stewardship & Healthcare Epidemiology, 1*(1), e28. https://doi.org/10.1017/ash.2021.191

[4]. Harvey, D., Valkenburg, W., & Amara, A., 2021, Predicting malaria epidemics in Burkina Faso with machine learning. *PLOS ONE, 16*(6), e0253302. https://doi.org/10.1371/journal.pone.0253302

[5]. Ji, C., Zou, X., Hu, Y., et al., 2019, XG-SF: An XGBoost classifier based on shapelet features for time series classification. *Procedia Computer Science, 147*, 24–28. https://doi.org/10.1016/j.procs.2019.01.087

[6]. Huang, J., & Ling, C. X., 2005, Using AUC and accuracy in evaluating learning algorithms. *IEEE*

Transactions on Knowledge and Data Engineering, 17(3), 299–310. https://doi.org/10.1109/TKDE.2005.50

[7]. Kalipe, G., Gautham, V., & Behera, R. K., 2018, Predicting malarial outbreak using machine learning and deep learning approach: A review and analysis. In *2018 International Conference on Information Technology (ICIT)* (pp. 33–38). IEEE. https://doi.org/10.1109/ICIT.2018.00017

[8]. Yaa, E. A., Quaye, I. K., Osei, P. P., et al., 2021, Malaria prediction model using machine learning algorithms. *Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12*(11), 7488–7496.

[9]. Nkiruka, O., Prasad, R., & Clement, O., 2021, Prediction of malaria incidence using climate variability and machine learning. *Informatics in Medicine Unlocked, 22*, 100508. https://doi.org/10.1016/j.imu.2020.100508

[10]. Kim, Y., Ratnam, J. V., Doi, T., et al., 2019, Malaria predictions based on seasonal climate forecasts in South Africa: A time series distributed lag nonlinear model. *Scientific Reports, 9*, 17882. https://doi.org/10.1038/s41598-019-54250-3

[11]. Higuchi, D., 2014, Characteristics of coping strategies for dysesthesia in preoperative patients with compressive cervical myelopathy. *Asian Spine Journal, 8*(4), 393–400. https://doi.org/10.4184/asj.2014.8.4.393

[12]. Castro, M. C., 2017, Malaria transmission and prospects for malaria eradication: The role of the environment. *Cold Spring Harbor Perspectives in Medicine, 7*(9), a025601. https://doi.org/10.1101/cshperspect.a025601

[13]. El-Hasnony, I. M., Elzeki, O. M., Alshehri, A., et al., 2022, Multi-label active learning-based machine learning model for heart disease prediction. *Sensors, 22*(4), 1184. https://doi.org/10.3390/s22031184

[14]. World Health Organization (WHO). 2017, *A framework for malaria elimination*. https://iris.who.int/handle/10665/254761

[15]. Weiss, D. J., Lucas, T. C. D., Nguyen, M., et al., 2019, Mapping the global prevalence, incidence, and mortality of Plasmodium falciparum, 2000–17: A spatial and temporal modelling study. *The Lancet, 394*(10195), 322–331. https://doi.org/10.1016/S0140-6736(19)31097-9

[16]. Garske, T., Ferguson, N. M., & Ghani, A. C., 2013, Estimating air temperature and its influence on malaria transmission across Africa. *PLoS ONE, 8*(2), e56487. https://doi.org/10.1371/journal.pone.0056487

[17]. Bhatt, S., Weiss, D. J., Cameron, E., et al., 2015, The effect of malaria control on Plasmodium falciparum in Africa between 2000 and 2015. *Nature, 526*(7572), 207–211. https://doi.org/10.1038/nature15535

[18]. Karuri, M. K., & Snow, R. W., 2016, Forecasting malaria burden in Africa using satellite meteorological data. *Frontiers in Public Health, 4*, 112. https://doi.org/10.3389/fpubh.2016.00112

[19]. Bousema, T., Griffin, J. T., Sauerwein, R. W., et al., 2012, Hitting hotspots: Spatial targeting of malaria for control and elimination. *PLoS Medicine, 9*(1), e1001165. https://doi.org/10.1371/journal.pmed.1001165

[20]. Reiner, R. C., Perkins, T. A., Barker, C. M., et al., 2015, A systematic review of mathematical models of mosquito-borne pathogen transmission: 1970–2010. *Journal of the Royal Society Interface, 12*(106), 20140921. https://doi.org/10.1098/rsif.2014.0921

[21]. Chang, H. H., Davis, G. M., & Waller, L. A., 2014, Mining spatio-temporal data on malaria for exploratory analysis and model building. *International Journal of Health Geographics, 13*(1), 31. https://doi.org/10.1186/1476-072X-13-31

[22]. Sturrock, H. J. W., Hsiang, M. S., Cohen, J. M., et al., 2013, Targeting asymptomatic malaria infections: Active surveillance in control and elimination. *PLoS Medicine, 10*(6), e1001467. https://doi.org/10.1371/journal.pmed.1001467

[23]. Snow, R. W., & Marsh, K., 2002, The consequences of reducing Plasmodium falciparum transmission in Africa. *Advances in Parasitology, 52*, 235–264. https://doi.org/10.1016/S0065-308X(02)52005-X

[24]. Omumbo, J. A., Hay, S. I., Goetz, S. J., et al., 2002, Updating historical maps of malaria transmission intensity in East Africa using remote sensing. *Photogrammetric Engineering & Remote Sensing, 68*(2), 161–166.

[25]. Osei, P., Frempong, G. A., & Nettey, O. E. A., 2020, Spatial analysis of malaria incidence and associated risk factors in Ghana. *Geospatial Health, 15*(1), 13–22. https://doi.org/10.4081/gh.2020.859

[26]. LeCun, Y., Bengio, Y., & Hinton, G., 2015, Deep learning. *Nature, 521*(7553), 436–444. https://doi.org/10.1038/nature14539

[27]. Müller, A. C., & Guido, S., 2016, Introduction to machine learning with Python: A guide for data scientists. *O'Reilly Media.*

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Understanding the Literacy Gap Between Boys and Girls: Perceptions of Teachers, Parents, Students, and Other Stakeholders

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Abstract

The persistent literacy gap between boys and girls continues to be a significant concern in education, with girls generally outperforming boys in reading and writing across various grade levels and regions. The causes of this disparity are multifaceted, shaped by social, cultural, and educational factors that influence students' literacy development. While existing studies highlight statistical trends and propose broad strategies for improving literacy outcomes, limited attention has been given to the perspectives of stakeholders directly involved in supporting learning. Understanding the viewpoints of teachers, parents, students, and policymakers is essential to identifying underlying barriers and designing effective, targeted interventions. Teachers provide valuable insights into how instructional methods, classroom dynamics, and curriculum design affect literacy performance. Parents play a central role by influencing literacy development through their expectations, attitudes, and involvement in home-based learning. Students' motivation, self-perception, and societal influence further shape their willingness and ability to engage with literacy tasks. Policymakers, however, must address the long-term implications of literacy disparities for educational equity, academic achievement, and future career opportunities. The COVID-19 pandemic exacerbated these challenges, as school closures and remote learning disproportionately affected students by gender due to unequal access to digital tools and heightened domestic responsibilities. Furthermore, the widening digital divide has limited opportunities for students to acquire essential digital literacy skills necessary for academic and professional success. By exploring stakeholders' perspectives, this study aims to provide a more comprehensive understanding of the factors contributing to gender-based literacy disparities and inform the development of more effective, equitable educational strategies.

Keywords: *Academic Success, Boys' Literacy, Classroom Dynamics, Educational Achievement, Educational Equity, Gender Disparity, Gender-Responsive Teaching, Girls' Literacy, Learning Styles, Literacy Gap, Masculinity and Literacy, Motivation in Literacy, Parental Involvement, Policy Interventions, Reading Habits, Reading Performance, Societal Expectations, Student Engagement, Teacher Perceptions, Writing Skills.*

Introduction

Gender disparities in literacy achievement remain a pressing concern in global education, with girls consistently outperforming boys in reading and writing across multiple regions and grade levels [1, 2]. This issue is particularly significant because literacy forms the foundation for success across all academic disciplines and influences long-term socioeconomic outcomes. Previous studies have primarily focused on statistical trends and generalized pedagogical interventions to address literacy gaps [3, 4]. However, limited attention has been paid to the perceptions of stakeholders directly involved in literacy development, such as teachers, parents,

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students, and policymakers. Understanding their perspectives provides valuable insights into the social, cultural, and educational factors contributing to boys' lower literacy performance [5, 6]. Within the context of St. James, Jamaica, where literacy disparities are prevalent, this study seeks to explore these stakeholder perspectives and identify practical strategies to promote gender equity in literacy achievement.

Research Problem and Research Question

This study aims to bridge the existing research gap by exploring the perceptions of key stakeholders regarding the literacy disparity between boys and girls. Specifically, it seeks to understand how teachers, parents, students, and policymakers view the factors contributing to boys' lower literacy performance and the potential strategies to address this issue. While previous studies have established the existence of the literacy gap; this research delves deeper into the social and educational dimensions shaping literacy outcomes from a stakeholder perspective.

Research Questions

1. How do teachers, parents, students, and policymakers perceive the literacy gap between boys and girls?
2. What factors do these stakeholders believe contribute to the disparity in literacy achievement?
3. What strategies and interventions do stakeholders consider effective in addressing the literacy gap and promoting gender equity in literacy development?

Methodology

The research design for this study employs a mixed-methods approach, incorporating surveys, interviews, and a literature review. This comprehensive design allows for both quantitative and qualitative insights into the perceptions and experiences of key stakeholders regarding the literacy disparity between boys and girls.

Surveys

Surveys will be distributed to 171 students for a population of 300, 36 teachers from a population of 40, and 19 parents and guardians from a population of 20 to gather quantitative data on their perceptions of the literacy gap and factors contributing to it. The surveys will include both closed and open-ended questions to allow for a broader understanding of the stakeholders' views.

Interviews

In-depth interviews will be conducted with selected teachers, parents, and policymakers to explore their perspectives in greater detail. These interviews aim to uncover specific insights into the social, cultural, and educational factors influencing the literacy gap, as well as the strategies they believe could address it.

Literature Review

Gender Disparities in Literacy and Educational Interventions

This literature review explores global research on gender disparities in literacy, examining social, cultural, and educational factors contributing to the persistent gap between boys and girls. It also highlights theoretical frameworks and educational interventions relevant to understanding these dynamics within the context of St. James, Jamaica. Existing studies consistently demonstrate that girls outperform boys in reading and writing across countries and grade levels, yet the underlying causes remain complex and multifaceted [1, 3].

Global Trends and Theories in Gender and Literacy

International assessments such as the Programme for International Student Assessment (PISA) and reports by the OECD

reveal that girls consistently achieve higher reading scores than boys in primary and secondary education [2, 4]. This pattern transcends cultural and socioeconomic contexts and is particularly pronounced in regions with limited educational resources. The disparity is significant because literacy forms the foundation for broader academic achievement and long-term socioeconomic mobility [5]. Research suggests that masculinity norms and societal expectations contribute to boys' lower engagement in literacy-related activities, as reading and writing are often perceived as "feminine" pursuits [6]. This social conditioning discourages boys from developing strong literacy skills, reinforcing gendered differences in academic outcomes and shaping long-term educational trajectories [7].

Cultural Conditioning and Curriculum Bias

Cultural conditioning plays a pivotal role in shaping gendered attitudes toward learning. Boys are frequently encouraged to pursue physical, spatial, and practical activities, while girls are guided toward verbal, linguistic, and communicative pursuits [8, 9]. As a result, girls are often better prepared to excel in literacy-related tasks. These patterns are further reinforced by curriculum bias, where teaching materials, classroom activities, and assessment tools implicitly favor linguistic skills more aligned with girls' developmental strengths [10]. Teachers, consciously or unconsciously, may provide greater attention and support to girls in literacy tasks, assuming their natural aptitude, while boys receive less targeted assistance [11]. This unbalanced approach deepens the literacy divide and perpetuates stereotypes about gendered academic abilities.

Home Environment, Parental Engagement, and Early Literacy

Parental involvement has been identified as a critical factor influencing literacy development [12]. In many contexts, parents are more likely to encourage reading and writing in girls, providing books, stories, and conversations that foster early language skills [13]. Boys, on the other hand, are often directed toward outdoor play or technical activities, which can limit their exposure to literacy-rich environments [14]. These early disparities are magnified over time, as children with stronger foundational literacy skills tend to perform better academically and engage more confidently with learning [15].

Teachers', Parents', and Students' Perceptions

Teachers' perceptions significantly influence instructional strategies and expectations around literacy [16]. Studies indicate that educators often expect higher literacy performance from girls, which can lead to subtle differences in feedback, support, and classroom interactions [17]. Parents' expectations similarly shape children's attitudes, with girls frequently receiving stronger encouragement for reading and writing at home [18]. Boys' lower self-perception of their literacy abilities can also lead to reduced motivation and engagement, creating a cycle of underperformance [19].

Educational Interventions and Policy Approaches

Several educational interventions have sought to address gender disparities in literacy, focusing on differentiated instruction, culturally relevant pedagogy, and targeted literacy programs [20, 21]. Gender-responsive teaching strategies encourage teachers to adopt diverse learning materials and interactive methods that engage both boys and girls [22]. Integrating culturally relevant content can make reading more relatable, particularly for boys, by connecting texts to their interests and lived experiences [23]. Policymakers are increasingly recognizing the importance of addressing these disparities early, with national literacy frameworks emphasizing equitable

resource distribution, teacher training, and parental involvement [24, 25].

Consequently, boys may not receive the same level of encouragement or support to develop essential literacy skills, further reinforcing the gender disparities in academic achievement. This highlights the need for educators to become more aware of these unconscious biases and implement gender-neutral teaching practices that promote equitable literacy development for all students. These findings highlight the need for an inclusive, gender-sensitive curriculum that challenges traditional gender roles and encourages all students to develop literacy skills equally. Teachers' awareness of gender bias in the curriculum can help mitigate this inequality and ensure that both boys and girls are given equal opportunities to succeed in literacy [8]. By actively recognizing and addressing these biases, teachers can create a more inclusive learning environment that caters to the needs of all students, regardless of gender. Implementing strategies such as differentiated instruction, providing diverse reading materials, and promoting gender-neutral classroom practices can help counteract the effects of traditional gender roles and encourage both boys and girls to develop strong literacy skills. This proactive approach can foster a more equitable academic environment, ultimately narrowing the literacy gap between genders.

The Role of Early Childhood Education

Early childhood education (ECE) plays a vital role in shaping children's literacy development. The UNESCO [10] report emphasizes the importance of early learning experiences in addressing gender disparities in literacy. Gender differences in reading and writing ability often become apparent by the time children reach primary school, and early interventions are critical in ensuring that boys are not left behind. Research by Paechter [11] suggests that ECE programs should be designed to encourage both boys and girls equally to engage in reading and writing activities, using materials and teaching methods that appeal to diverse learning styles. Early childhood educators can play a pivotal role in reducing literacy disparities by providing activities that foster early literacy skills in boys, who may otherwise not receive the same encouragement in their home environments [11]. For example, including more male role models in early literacy education or incorporating storytelling and literacy games into the curriculum could increase boys' engagement with reading.

Impact of Gendered Expectations on Teacher Practices

Gendered expectations extend beyond societal norms and into the classroom, where they influence teacher practices and behaviors. According to Skelton [12], teachers often hold unconscious gender biases that impact how they interact with male and female students. For example, male students may receive less verbal praise for their literacy achievements than their female counterparts, potentially due to a cultural assumption that boys are less competent in literacy tasks. These biases can affect boys' self-esteem and motivation to engage in reading and writing, thus exacerbating the literacy gap [12]. When boys are consistently exposed to the stereotype that they are less proficient in literacy-related activities, they may internalize these beliefs, leading to reduced confidence in their abilities. This diminished self-esteem can result in lower levels of engagement with reading and writing tasks, which are essential for literacy development. As a result, the cycle of underachievement persists, further widening the literacy gap between boys and girls. Addressing these biases through inclusive teaching practices can help to boost boys' confidence, foster a positive attitude towards literacy, and ultimately improve their academic performance. Research has shown that gendered expectations and stereotypes can

significantly influence the way teachers interact with students, particularly in literacy development. Tenenbaum and Ruck [13] also note that teachers tend to encourage boys to be more independent and less verbally expressive, which may hinder their literacy development. Conversely, girls are often praised for their verbal communication skills, leading to an educational environment that reinforces existing gender inequalities in literacy.

The Role of Mixed-Methods Research in Addressing Literacy Disparities

To understand the complex nature of gender disparities in literacy, a mixed-methods approach is highly beneficial. As Creswell [3] states, a mixed-methods design allows researchers to integrate both quantitative and qualitative data, providing a richer and more comprehensive view of the research problem. This approach enables researchers to quantify patterns and trends in literacy achievement (e.g., through surveys) while also exploring the personal, subjective experiences of stakeholders (e.g., through interviews). The triangulation of data from different sources strengthens the validity of the study's findings and ensures a more nuanced understanding of the issue [5]. By collecting both quantitative data from surveys and qualitative data from interviews, researchers can cross-verify and complement the findings, providing a more comprehensive picture of the literacy gap between boys and girls. This approach allows for a deeper exploration of the factors influencing the gap, such as societal expectations, teaching practices, and individual experiences, while also offering statistical evidence to highlight broader trends. Triangulation not only enhances the credibility of the study but also helps to identify patterns and inconsistencies, leading to more reliable and actionable conclusions. In the context of literacy disparities, a mixed-methods design allows researchers to examine not only the statistical trends in boys' and girls' literacy achievement but also to understand the reasons behind these disparities. Johnson and Onwuegbuzie [4] emphasize that combining qualitative and quantitative methods provides a fuller picture of educational issues, which can then inform more effective interventions and policies. In the case of the literacy gap, combining survey data on reading scores with interview data on teacher practices and student experience provides valuable insights that can lead to more tailored educational strategies.

Conclusion

In conclusion, research within the context of St. James, Jamaica, highlights significant gender disparities in literacy achievement, with boys generally underperforming compared to girls, particularly in reading and writing. These disparities are influenced by a variety of factors unique to the parish, including societal expectations, cultural conditioning, and biases present within the local curriculum. In St. James, where schools often face challenges such as limited resources and a lack of targeted teaching strategies, early childhood education and teacher practices play a pivotal role in either exacerbating or mitigating these disparities. To fully understand the causes of the literacy gap in this specific context and develop effective strategies for addressing it, a mixed-methods approach is essential. By combining both quantitative and qualitative data, researchers can gain a comprehensive understanding of the issue and formulate interventions that are grounded in the real-world experiences of the teachers, parents, and students in St. James.

Data Collection and Analysis: How Data Will Be Collected and Analyzed to Address Research Questions

The research aims to explore the perceptions of key stakeholders, teachers, parents, students, and policymakers, regarding the literacy gap between boys and girls, the factors contributing to this gap, and the strategies they consider

effective in promoting gender equity in literacy development. A mixed-methods approach will be employed to collect both quantitative and qualitative data to provide a comprehensive understanding of the issue. Below is an expanded explanation of how data will be collected and analyzed to address each of the research questions.

How Do Teachers, Parents, Students, and Policymakers Perceive the Literacy Gap Between Boys and Girls?

Data Collection

The perception of stakeholders regarding the literacy gap will be primarily collected through surveys and interviews.

Surveys

A survey will be distributed to 171 students, 36 teachers, and 19 parents and guardians. The survey will include both closed-ended questions (Likert scales, multiple-choice) and open-ended questions that ask about their views on the literacy gap. These questions will focus on perceptions about gender differences in literacy achievement, the reasons for these differences, and their observations of literacy trends within their school or home environments.

Example of a survey question

1. In your opinion, which gender tends to perform better in reading and writing?
2. What do you think contributes to this trend?"

Interviews

In-depth semi-structured interviews will be conducted with a subset of teachers, parents**,** and policymakers.

These interviews will provide richer, more detailed qualitative data. Questions will focus on participants' experiences and perceptions regarding boys' and girls' literacy achievements, any observed disparities, and their personal views on the contributing factors.

Example of an interview question

1. Can you share your experiences regarding gender differences in literacy performance?
2. What do you think contributes to the challenges boys face in literacy development?"

Data Analysis

Quantitative Data Analysis

The survey data will be analyzed using descriptive statistics (e.g., frequencies, means) to identify general trends in perceptions. For example, how many teachers believe there is a significant gap between boys' and girls' literacy achievements, and how this perception is linked to demographic variables such as age or years of teaching experience. Chi-square tests will be used to examine whether perceptions of the literacy gap differ significantly across different stakeholder groups (teachers, parents, students).

Qualitative Data Analysis

The interview data will be analyzed using thematic analysis [1]. Codes will be developed based on recurring themes related to perceptions of the literacy gap, such as gender stereotypes, cultural influences, or societal expectations. These themes will be refined through the coding process to capture the most important aspects of participants' views.

What Factors Do These Stakeholders Believe Contribute to Disparity in Literacy Achievement?

Data Collection

To explore the factors contributing to the literacy gap, both surveys and interviews will again be used, with questions specifically designed to uncover these factors.

Surveys

The survey will include questions asking participants to identify the factors they believe contribute to the literacy gap. These factors could include cultural influences, teaching

methodologies, home environment, and gendered expectations. Participants will also be asked to rank these factors in order of importance.

Example of a survey question

What do you think are the most important factors contributing to the literacy gap between boys and girls? (e.g., teacher expectations, home support, societal norms, etc.).

Interviews

The interview questions will probe deeper into the specific factors mentioned by participants in the surveys. The researcher will explore how these factors are perceived to influence literacy development among boys and girls. The interviews will allow for clarification and elaboration on factors that participants believe are particularly significant in the local context of St. James, Jamaica.

Example of an interview question

1. You mentioned teacher expectations as a factor contributing to the literacy gap?
2. Can you explain how these expectations affect boys' literacy development?

Data Analysis

Quantitative Data Analysis

In addition to the descriptive statistics already described, correlation analysis will be used to explore the relationships between demographic variables (e.g., gender, grade level, parental involvement) and perceptions of contributing factors. For example, whether teachers who have more years of experience believe different factors contribute to the literacy gap compared to less experienced teachers.

Qualitative Data Analysis

The thematic analysis of interview data will be used to identify and categorize the specific factors contributing to the literacy gap. The analysis will identify patterns such as gender stereotypes, cultural conditioning, or curriculum bias that stakeholders identify as significant. These themes will help contextualize the quantitative survey findings.

What Strategies and Interventions Do Stakeholders Consider Effective in Addressing the Literacy Gap and Promoting Gender Equity in Literacy Development?

Data Collection

The identification of effective strategies will also be collected through surveys and interviews.

Surveys

The survey will ask stakeholders about the strategies they believe are most effective in addressing the literacy gap. This could include targeted teaching practices, parental involvement, curriculum adjustments, and peer support programs. Respondents will be asked to rank the strategies in terms of perceived effectiveness.

Example of a survey question

1. Which strategies do you believe
2. would be most effective in narrowing the literacy gap between boys and girls? (e.g., mentorship programs, gender-sensitive curriculum, teacher training, etc)".

Interviews

The interviews will explore in-depth the strategies stakeholders have implemented or observed in practice. This will provide insight into what has worked (or not worked) in addressing the literacy gap and promoting gender equity. The interviews will also allow stakeholders to propose new strategies based on their experiences and observations.

Example of an interview question

1. What strategies have you seen or used that you think help boys improve their literacy skills?
2. Do you think gender-sensitive interventions are necessary, and if so, how

would they work?

Data Analysis

Quantitative Data Analysis

The survey data will be analyzed using descriptive statistics to summarize the most commonly mentioned strategies. Chi-square tests or ANOVA could be used to compare stakeholder groups' preferences for different strategies (e.g., teachers vs. parents).

Qualitative Data Analysis

The interview data will be analyzed using thematic analysis, as mentioned earlier. Themes related to effective strategies will be identified and analyzed. For example, a theme might emerge around gender-sensitive teaching practices, which could include differentiated instruction that addresses the needs of boys and girls. The analysis will also consider challenges or barriers to implementing these strategies in the school system.

Integration of Quantitative and Qualitative Data

By combining quantitative and qualitative findings, the study will provide a well-rounded perspective on the literacy gap. Triangulation [1] will allow the researcher to compare and corroborate findings from both the surveys and the interviews. For instance, if quantitative data indicates a significant gender gap in literacy, qualitative data from interviews can help explain why this gap exists, focusing on factors like societal expectations or teaching practices. Additionally, the identification of effective strategies from both data types will help ensure that the recommendations made are well-supported and practical.

Conclusion

Through the integration of surveys and interviews, this mixed-methods study provides a comprehensive understanding of the literacy gap between boys and girls, the factors contributing to it, and strategies to address it. Quantitative data offers statistical evidence, while qualitative data gives deeper insight into the experiences and perspectives of stakeholders involved in students' literacy development [1, 2]. This approach ensures that findings are both empirical and contextually relevant, enabling meaningful recommendations to improve gender equity in literacy education [3].

The Gender Literacy Gap: An Overview

Research consistently highlights disparities in literacy performance between boys and girls. National assessments indicate that girls generally outperform boys in reading and writing across grade levels in various countries [4, 5]. Factors contributing to this gap include societal expectations, reading habits, motivation, and teaching approaches [6, 7]. Boys and girls often engage differently with reading: boys typically show less interest in traditional literacy activities [7]. Teaching methods, such as genre focus or instructional style, can either reinforce or challenge these patterns, shaping students' engagement and success in literacy [8].

Cultural Gender Disparities in Literacy

Cultural Expectations and Gender Roles

Cultural norms strongly influence early literacy development. Boys are often encouraged to engage in active, physical pursuits, while girls are directed toward communication-based and literacy-focused activities [9]. Early socialization can discourage boys from reading due to perceptions of reading as "feminine" or weak [10]. Peer influence further reinforces these stereotypes, reducing boys' engagement with literacy [11]. Both parents and teachers must actively foster activities that align with boys' interests to cultivate lifelong reading habits [12].

Societal Norms and Masculinity

In St. James, Jamaica, boys consistently lag behind girls in literacy due to societal

expectations, home environments, and school practices [13]. Reading and writing are often perceived as feminine activities, and boys who engage in them may face social pressure to conform to traditional masculine norms [14]. Peer, family, and media influences contribute to this perception, often discouraging boys from developing strong literacy skills [15]. Without positive reinforcement and role models, boys are less likely to excel academically [16].

Evidence of Boys' Literacy Struggles

Data from the Primary Exit Profile (PEP) examinations show a persistent literacy gap between boys and girls [17]. Ministry of Education reports indicate that boys' literacy rates have remained below the national average for over a decade [18]. International trends, such as those reported by NAEP, reflect similar disparities, with girls outperforming boys in reading and writing [4, 5]. Educator interviews confirm that boys often struggle with comprehension, vocabulary, and written expression and prefer action-oriented reading materials over traditional texts [6].

Home and School Environment

The home environment significantly affects literacy development. Boys frequently receive less encouragement to read, and access to books or male literacy role models is often limited [19]. In classrooms, teaching strategies may unintentionally favor girls' learning styles, emphasizing passive, structured, and quiet reading activities that may not engage boys [7, 20]. Implicit biases among teachers can reinforce lower expectations for boys, influencing interactions and instructional methods [21].

Addressing the Literacy Gap

A multifaceted approach is essential:

1. **Culturally Relevant Reading Materials:** Books reflecting boys' interests, such as sports and adventure, increase engagement [7].
2. **Positive Male Role Models:** Male teachers, fathers, and community leaders promoting literacy can reshape boys' perceptions [22].
3. **Interactive Teaching Strategies:** Hands-on, movement-based, and gamified literacy activities align with boys' learning preferences [6].
4. **Parental Involvement:** Educating parents on the importance of literacy and strategies to support reading at home enhances engagement [23].

By addressing societal norms and implementing targeted interventions, educators and policymakers can work toward closing the literacy gap in St. James [24].

Curriculum Bias and Teaching Strategies

Literacy curricula often favor girls' learning preferences, focusing on relational and emotional themes [25]. Traditional strategies emphasize prolonged reading and writing, which may not align with boys' preference for interactive or visually stimulating activities [22]. Integrating diverse texts, including action-based narratives, comics, and digital tools, can foster boys' interest [26]. Game-based learning may further support engagement while teaching literacy skills [27].

Holistic Strategies to Address Gender Disparities

Addressing boys' lower literacy requires:

1. A culturally responsive curriculum with diverse texts.
2. Gender-neutral literacy practices in early education and at home.
3. Teacher training to mitigate implicit biases.
4. Interactive, movement-based literacy strategies to match diverse learning styles [22, 23].

Early Childhood and Home Literacy Environments

Parental influence is crucial in early literacy. Research shows that parents often engage differently with boys and girls: mothers read

more with daughters, while fathers emphasize physical play with sons [9, 28]. Early childhood educators may reinforce gendered literacy practices through toys and learning materials [29]. Ensuring equal literacy encouragement from home and school, with tangible rewards for engagement, helps bridge these disparities [30].

Stakeholder Perceptions

Teachers' Perceptions

Teachers observe the gender gap firsthand, noting lower literacy engagement among boys [26]. Boys often prefer active, hands-on learning, while girls are more reflective and verbal [22]. Gender-responsive teaching strategies, including interactive activities, can help, but lowered expectations for boys may perpetuate the gap [5].

Parents' Perceptions

Parents are aware of the literacy gap and often note that boys engage more with non-literacy activities [25]. Positive parental involvement, such as reading together, significantly improves literacy outcomes for both genders [30, 23].

Students' Perceptions

Boys often report lower confidence in literacy due to societal stereotypes linking reading with femininity [6]. Girls generally display higher confidence and engagement, which perpetuates disparities [26]. Tailoring literacy activities to students' interests improves motivation and success [27].

Other Stakeholders

Administrators and policymakers recognize the broader implications of literacy gaps. Interventions, such as male-focused reading programs and mentorship, can provide targeted support while promoting role models [26, 31]. Gender-disaggregated data collection and evidence-based policy implementation are critical for addressing these disparities effectively [32].

Community and Policy Interventions

Community-based literacy programs, such as after-school clubs and mentorship initiatives, provide boys with reading opportunities outside school [27]. Data-driven educational policies ensure monitoring of gender-specific outcomes, and legislative support can mandate gender equity in literacy [32]. Performance-based incentives for schools and teachers can encourage innovative approaches and measurable improvements [31].

In St. James, addressing the literacy gap requires coordinated efforts from schools, parents, policymakers, and communities. Gender-responsive curricula, teacher training, parental engagement, and community initiatives, supported by data-driven policies, can collectively create a sustainable impact, improve literacy outcomes and promote equitable education for all students [32, 27].

Conclusion

This study highlights the persistent literacy gap between boys and girls, particularly in St. James, Jamaica, and underscores the multifaceted factors contributing to this disparity. Evidence from both quantitative and qualitative data demonstrates that boys consistently underperform in reading and writing compared to girls, a trend influenced by societal norms, cultural expectations, curriculum biases, home environments, and teaching practices. Boys' literacy engagement is often hindered by stereotypes associating reading and writing with femininity, limited male role models, and instructional strategies that do not align with their learning preferences.

Addressing these disparities requires a holistic, evidence-based approach. Early childhood interventions, culturally relevant reading materials, gender-responsive teaching strategies, parental involvement, and positive male role models are critical components of

fostering equitable literacy outcomes. Teachers' awareness of implicit biases and adoption of inclusive, interactive, and differentiated literacy practices can further support boys' engagement and achievement. Moreover, data-driven policies, community-based programs, and legislative support are necessary to ensure sustainable progress and systemic change.

By integrating these strategies, schools, families, and policymakers can work collaboratively to close the gender literacy gap, promote equity, and create an educational environment where all students, regardless of gender, have the opportunity to succeed academically. Ultimately, addressing this issue not only enhances boys' literacy outcomes but also contributes to a more inclusive and equitable educational system, preparing all students for lifelong learning and success in a rapidly evolving global society.

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Conflict of Interest

The authors declare that there are no conflicts of interest associated with this study. This research was conducted independently, without any financial, personal, or professional relationships that could have inappropriately influenced the study's design, data collection, analysis, interpretation, or reporting of findings. The authors affirm that all results, conclusions, and recommendations presented are based solely on the research evidence obtained and the objective analysis of data. No external organizations, sponsors, or funding bodies had any role in influencing the study outcomes, ensuring that the findings reflect an unbiased and impartial assessment of gender disparities in literacy in St. James, Jamaica.

References

[1]. Alloway, N., Freebody, P., Gilbert, P., & Muspratt, S., 2023. Boys, literacy and schooling: Expanding the repertoires of practice. *Routledge*. https://doi.org/10.4324/9780203464943

[2]. Arnot, M., 2014. The Gendered Construction of Literacy and Learning: Gender, Inequality, and the Education of Boys and Girls. *Springer*.

[3]. Bailey, B., 2017. Gender socialization and education: Challenges and solutions. Kingston, *Jamaica: University of the West Press*.

[4]. Baker, D. P., & LeTendre, G. K., 2014. National differences, global similarities: World culture and the future of schooling. *Stanford University Press*.

[5]. Baker, L., & Scher, D., 2023. Beginning readers' motivation for reading in relation to parental beliefs and home literacy experiences. *Reading Psychology, 24*(4), 297–316. https://doi.org/10.1080/02702710390 227297.

[6]. Braun, V., & Clarke, V., 2021. Thematic analysis: A practical guide. *SAGE Publications.*

[7]. Brown, C., 2019. The impact of literacy interventions on primary school boys in Jamaica. *Caribbean Journal of Education, 41*(2), 120–135.

[8]. Creswell, J. W., 2014. Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.). *SAGE Publications*.

[9]. Dillon, D. R., & Brown, M., 2019. Boys, reading, and masculinity: Toward a theory of boyhood literacy. *Routledge*.

[10]. European Investment Bank. 2020. Gender digital divide: The hidden barrier to gender equality in education. https://www.eib.org/en/essays/gender-digital-divide.

[11]. Evans, M., 2018. Classroom strategies for engaging boys in literacy development. *Educational Research Quarterly, 41*(3), 56–72.

[12]. Farrington, C. A., 2012. Improving literacy skills: Understanding the gender gap and its implications for education. *Journal of Educational Psychology, 104*(3), 612–624. https://doi.org/10.1037/a0029009

[13]. Ferguson, P., 2021. Masculinity and academic achievement: A study of Caribbean boys. *Caribbean Educational Review, 45*(1), 88–102.

[14]. Fletcher, J., Greenwood, J., Grimley, M., & Parkhill, F., 2023. Boys and reading: An inquiry into the attitudes of boys and teachers. *Literacy, 45*(1), 31–40. https://doi.org/10.1111/j.1741-4369.2010.00556.x.

[15]. Gurian, M., & Stevens, K., 2010. The minds of boys: Saving our sons from falling behind in school and life. *Jossey-Bass*.

[16]. Hargreaves, E., Ladd, F., & Goldstein, H., 2008. How parent involvement affects student achievement: A comprehensive review. *Educational Psychology, 28*(1), 75–90. https://doi.org/10.1080/01443410701, 851400.

[17]. Hughes, D., Hargreaves, E., & Kaye, S., 2013. Parental engagement in literacy education: The role of gender and socioeconomic factors. *Journal of Educational Psychology, 35*(4), 453–467. https://doi.org/10.1037/edu0000017

[18]. James, T., & Miller, S., 2020. Parental influence on boys' reading habits in primary schools. *Journal of Caribbean Education Studies, 38*(4), 200–215.

[19]. Jerrim, J., & Sims, S., 2022. How do teacher expectations and biases influence gender gaps in literacy? *Educational Research Review, 37*, 100468. https://doi.org/10.1016/j.edurev.2022.100468.

[20]. Johnson, R. B., & Onwuegbuzie, A. J., 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26. https://doi.org/10.3102/0013189X03 3007014.

[21]. Jones, E., & McCauley, M., 2013. Gender differences in literacy engagement: Exploring the reading habits of boys and girls. *Literacy Research and Instruction, 52*(2), 135–155. https://doi.org/10.1080/19388071.20 12.749194.

[22]. Krywult-Albanska, E., & Albanski, M., 2021. The impact of COVID-19 on gender disparities in education. *Journal of Educational Policy, 37*(4), 401–418. https://doi.org/10.1080/02680939.2021.1901423

[23]. McGeown, S. P., Goodwin, H., Henderson, N., & Wright, P., 2022. Gender differences in reading motivation: Does sex or gender identity provide a better account? *Journal of Research in Reading, 35*(3), 256–272. https://doi.org/10.1111/j.1467-9817.2012.01524.x.

[24]. Miller, D., Juvonen, J., & Emslie, J., 2020. The effects of gender-responsive teaching on literacy outcomes. *Journal of Educational Psychology, 112*(2), 230–245. https://doi.org/10.1037/edu000399

[25]. Ministry of Education, Youth, and Information. 2022. Annual report on literacy development in Jamaica. Kingston, *Jamaica: Government of Jamaica*.

[26]. Moss, G. 2020. Literacy and gender: Researching texts, contexts and readers. *Routledge.* https://doi.org/10.4324/97802034550 33.

[27]. Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M., 2020. *PIRLS 2021:* Design and methodology. *TIMSS & PIRLS International Study Center*.

[28]. OECD. 2021. Education at a glance 2021: OECD indicators. *OECD Publishing*. https://doi.org/10.1787/4dd50c09-en

[29]. OECD. 2021. PISA 2018 results: Volume I: What students know and can do. *OECD Publishing*. https://doi.org/10.1787/5f07c754-en

[30]. Paechter, C., 2015. Masculinity, femininity and educational change: The role of gender in educational reform. *Routledge*.

[31]. Pajares, F., & Valiante, G. 2022. Gender differences in writing motivation and achievement of middle school students: A function of gender orientation? *Contemporary Educational Psychology*, *26*(3), 366–381. https://doi.org/10.1006/ceps.2000.1069

[32]. Parry, O., 2000. Male underachievement in education: A Caribbean perspective. Mona, *Jamaica: University of the West Indies Press*.

[33]. Pomerantz, E. M., Moorman, E. A., & Litwack, S. D., 2007. The how, who, and why of parents' involvement in children's academic lives: More is not always better. *Child Development, 78*(3), 828–845. https://doi.org/10.1111/j.1467-8624.2007.01035.x

[34]. Robinson, J. P., & Lubienski, S. T., 2023. The effects of gender stereotypes on boys' and girls' reading performance. *American Educational Research Journal*, *50*(1), 168–200. https://doi.org/10.3102/00028312124 69045.

[35]. Sadker, D., & Sadker, M., 2020. Failing at fairness: How America's schools cheat girls. *Touchstone.*

[36]. Sax, L. 2021. Why gender matters: What parents and teachers need to know about the emerging science of sex differences. *Harmony*.

[37]. Snowling, M. J., Hulme, C., & Nation, K., 2021. Defining and understanding dyslexia: Past, present and future. *Journal of Child Psychology and Psychiatry*, *61*(5), 546–568. https://doi.org/10.1111/jcpp.13212

[38]. Sullivan, A., & Brown, M., 2023. Social inequalities in early reading development: The role of behavior problems. *Child Development*, *84*(6), 1880–1896. https://doi.org/10.1111/cdev.12087

[39]. Tashakkori, A., & Teddlie, C., 2003. Handbook of mixed methods in social and behavioral research. *SAGE Publications*.

[40]. U.S. Department of Education. 2019. The nation's report card: Reading and writing assessments. Washington, DC: National Center for Education Statistics.

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Community Participation and Strategic Frameworks for Advancing Health Insurance Coverage in Katsina State

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Abstract

Universal Health Coverage (UHC) remains elusive in Nigeria, particularly in Katsina State, where less than 10% of the population has health insurance and 70% pay for care out-of-pocket amidst deep poverty. This paper examines how community participation and strategic policy frameworks can expand insurance coverage, focusing on Community-Based Health Insurance (CBHI) as a potential vehicle. Employing a qualitative case study design, this research draws on Focus Group Discussions with community leaders, residents, and health officials across four diverse communities in Katsina State to explore local perceptions and barriers. The findings reveal that while significant challenges—including low awareness, deep-seated mistrust in formal institutions, and concerns over premium affordability—hinder uptake, there is a strong willingness to pay for CBHI. However, this is contingent on transparent, community-led management and the availability of pro-poor subsidies. Based on these results, the study proposes a multi-faceted strategy centered on intensive public awareness, subsidized premiums for low-income residents, strengthening the Katsina State Contributory Healthcare Management Agency (KATSCHMA), and genuine community involvement in the design and governance of insurance plans to build trust and ensure sustainability.

Keywords: *Community Participation, Health Insurance, Katsina State, Nigeria, Strategic Framework, Universal Health Coverage.*

Introduction

Healthcare financing is one of the most critical challenges facing developing nations in their pursuit of universal health coverage (UHC), especially in resource-constrained settings. In Nigeria, fewer than 5% of the population are enrolled in the National Health Insurance Scheme (NHIS), and about 70% of people pay for healthcare directly out-of-pocket (OOP). The NHIS, established in 2005, primarily covers federal government employees, leaving the vast majority of the population, particularly those in the informal sector, without coverage. This reliance on OOP payments creates significant financial barriers and can lead to catastrophic health expenditures for households.

The situation in Katsina State exemplifies these challenges. With a projected 2022 population of over 10 million [10] and 66.7% of its residents considered multidimensionally poor, the state has one of the lowest Human Development Index (HDI) scores in Nigeria. Less than 5% of the population is covered by health insurance, and the doctor-patient ratio is a stark 1:52,000, far from the WHO-recommended 1:1,000. These factors are compounded by high maternal and infant mortality rates, underscoring the urgent need for innovative financing solutions.

Community-Based Health Insurance (CBHI) has emerged as a promising approach to address these gaps. CBHI schemes are voluntary, community-managed programmes that pool

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resources to cover healthcare costs, promoting community ownership and participation. They are particularly suited for informal sector workers and rural populations where conventional insurance is often inaccessible.

Methodology

This study adopted a qualitative case study design to explore the complexities of implementing CBHI in Katsina State. This approach allows for an in-depth understanding of complex social phenomena, such as community perceptions and institutional readiness, which cannot be easily quantified.

Study Setting

The study was conducted in Katsina State, located in northwestern Nigeria. Four communities were selected across the state's three senatorial zones (Danja, Dabai, Mashi, and Kurfi) to ensure representation of diverse socio-economic and healthcare contexts. The state's healthcare system faces significant challenges, including inadequate infrastructure, a severe shortage of healthcare workers, and extremely low health insurance coverage, with less than 5% of the population insured [13]. Over 70% of the population lives in rural areas and is engaged in informal agricultural activities, making conventional insurance models difficult to implement.

Study Population and Sampling

A purposive sampling technique was used to select key stakeholders who play pivotal roles in healthcare decision-making and community governance. The study population included Ministry of Health (MOH) officials, community leaders, and local residents involved in Focus Group Discussions (FGDs). A total of four FGDs were conducted, one in each selected community. This qualitative approach prioritises depth and detail over statistical generalisability, making it ideal for exploring the nuances of CBHI implementation in a resource-constrained setting.

Data Collection

The primary data collection method was Focus Group Discussions (FGDs), supported by a semi-structured interview guide. This method allowed for a detailed exploration of participants' perspectives, experiences, and attitudes towards CBHI. The guide covered key themes aligned with the research objectives, including awareness and perceptions of CBHI, socio-economic factors, healthcare infrastructure, and cultural/organizational factors. All discussions were audio-recorded with participants' consent and transcribed verbatim for analysis.

Data Analysis

A thematic analysis approach was employed to identify, analyse, and report patterns (themes) within the data. The analysis was supported by NVivo qualitative data analysis software to ensure a systematic and transparent process. The analysis involved familiarising with the data, generating initial codes, searching for and reviewing themes, and finally defining and naming the themes for reporting.

Ethical Considerations

The study adhered to strict ethical principles, including voluntary participation, informed consent, confidentiality, and anonymity. Ethical approval was obtained from the relevant institutional review board before data collection began. Participants were fully informed about the study's purpose and their right to withdraw at any time. All identifying information was removed from transcripts to protect participant anonymity.

Results

The findings from the Focus Group Discussions are presented across seven key themes that emerged from the thematic analysis.

Theme 1: Community Awareness and Perceptions of CBSHI

Awareness of CBHI was mixed. Some participants, particularly community leaders, understood it as a collaborative scheme where "Households and the government are contributing... aimed at helping the less privileged". However, awareness in other areas was significantly lower, with one participant stating, "I have heard about it, but I don't know how it works or how to join". Misconceptions were common, such as the belief that the scheme was only for government workers. Perceptions were generally positive among those aware of the scheme, viewing it as "helpful and beneficial," especially for those unable to afford hospital bills. However, this was often tempered by scepticism and a lack of trust based on past experiences with government programmes that "never reach us in the rural areas".

Theme 2: Socio-Economic Factors Influencing Participation

Income, education, and social status were key determinants of participation. The potential of CBHI to alleviate the financial burden of healthcare was a major draw for low-income households. However, the affordability of premiums remains a significant barrier, especially given the unstable and seasonal nature of income in agrarian communities. One participant noted, "During the farming season, we have money, but after harvest, it becomes difficult to pay for anything extra". Education also played a role; educated individuals were perceived as more likely to understand the benefits, while "the uneducated ones are afraid of being cheated".

Theme 3: Healthcare Infrastructure and Service Quality

Participants across all communities expressed deep concerns about the poor state of healthcare infrastructure. A common sentiment was that health centres lack basic drugs and equipment, and are understaffed. One person lamented, "The hospital is far, and when we get there, the doctors are not always available". This poor service quality undermines the attractiveness of any insurance scheme. As one participant questioned, "How can she [a single nurse] handle more patients if more people join the scheme?". There was some optimism that CBHI could channel more funds to facilities, but this was coupled with a strong demand for transparency and accountability in managing those funds.

Theme 4: Cultural and Organizational Factors

Cultural beliefs, particularly the reliance on traditional healers, were identified as a challenge to the adoption of formal healthcare insurance. Community leaders and local organizations were seen as critical for implementation. The support of a village head, for instance, could persuade people to join due to trust. Conversely, mistrust in leaders could hinder participation. Religious beliefs were seen as both a facilitator—with the scheme aligning with values of mutual help—and a potential barrier if the scheme was perceived to conflict with religious teachings.

Theme 5: Affordability and Financial Sustainability

This theme overlaps with socio-economic factors but focuses on the scheme's viability. Participants worried that "if the scheme is not well managed, it will collapse, and we will lose our money". This reflects a widespread lack of trust in the management of financial schemes. The need for transparent governance, such as a community-led oversight committee, was strongly articulated. Despite this, the core value proposition of financial protection was recognised: "It is better to pay a small amount regularly than to be hit with a big bill when you are sick".

Theme 6: Barriers to Participation

The primary barriers identified were mistrust, inadequate information, and financial constraints. Mistrust in government initiatives was a recurring issue, rooted in past unfulfilled promises. A lack of clear, accessible information left many confused about the scheme's mechanics, benefits, and enrolment process. Financial constraints remained a fundamental obstacle for households with low and unstable incomes.

Theme 7: Community-Driven Initiatives

Existing community structures like health committees, religious groups, and youth organizations were identified as potential enablers for CBHI implementation. These groups are trusted and can play a vital role in health education, mobilization, and promotion of the scheme. Participants felt that if the scheme were managed by trusted community members, willingness to join would increase significantly.

Discussion

The findings from this study highlight a complex interplay of enthusiasm and significant barriers to implementing CBHI in Katsina State. The mixed levels of awareness and prevalent misconceptions align with research across Sub-Saharan Africa, which identifies low awareness as a primary obstacle to health insurance uptake. The scepticism and mistrust reported by participants are also well-documented, often stemming from previous negative experiences with government programmes and concerns about mismanagement. This underscores that successful implementation is not merely a technical exercise but requires building social capital and trust.

Affordability remains a central challenge, especially for households with seasonal and unpredictable incomes, a finding consistent with studies on agrarian communities. The high willingness to pay found in some surveys suggests latent demand, but this willingness must be matched with ability [14]. This reinforces the need for flexible, pro-poor financing mechanisms, such as subsidised premiums and non-linear payment schedules, which can be supported by leveraging federal initiatives like the Basic Health Care Provision Fund (BHCPF) [3].

The poor state of healthcare infrastructure and service quality presents a classic "chicken-and-egg" problem. Residents are reluctant to pay for a scheme that gives them access to substandard services, while facilities cannot improve without increased funding. This confirms that demand-side financing interventions like CBHI must be coupled with supply-side improvements. Integrating CBHI with broader health system strengthening efforts, as proposed in strategic frameworks, is therefore essential.

Finally, the study affirms the centrality of community participation. The reliance on traditional healers, the influential role of community and religious leaders, and the demand for community-led management all point to the necessity of a bottom-up approach [4]. Top-down models that fail to account for these local dynamics are likely to fail. The strategic recommendation to involve Ward Development Committees, local associations, and community leaders in scheme design, management, and oversight is strongly supported by the data from this study and the broader literature.

Conclusion

This study confirms that while CBHI holds significant potential to improve healthcare access and provide financial protection in Katsina State, its successful implementation is contingent on overcoming substantial challenges. Key barriers include low awareness, deep-seated mistrust in formal institutions, premium affordability for the poor, poor quality of healthcare services, and cultural factors influencing health-seeking behaviours.

The findings lead to several key recommendations. First, intensive and sustained public awareness campaigns using trusted community channels are essential to build knowledge and trust. Second, premiums must be made affordable through subsidies and flexible payment mechanisms tailored to the seasonal income patterns of rural households. Third, investments in improving healthcare infrastructure and service quality must occur in parallel with the rollout of the insurance scheme to ensure value for enrolees. Finally, and most critically, a genuine community-driven approach is non-negotiable. Involving community leaders, religious institutions, and residents in the design, governance, and monitoring of the scheme is the most effective way to ensure its cultural appropriateness, transparency, and long-term sustainability.

By integrating these strategies, Katsina State can move beyond its current low insurance coverage and make meaningful progress towards achieving universal health coverage for all its citizens.

Strengthening Arguments with Data

Robust data are essential to justify investments in health insurance and to guide evidence-based policymaking. In this section, we consolidate key data points that support the recommendations proposed in this paper and demonstrate the feasibility of expanding coverage in Katsina State.

National Health Insurance Trends

As of December 2024, the National Health Insurance Authority (NHIA) announced that 19.2 million Nigerians were enrolled in various health insurance schemes [7]. While this represents significant progress compared to the previous decade, it still covers less than 10% of the total population—far below the UHC target. This data point is crucial because it shows growing momentum at the federal level, which Katsina can tap into through alignment with national policies and funding.

Katsina-Specific Enrollment and Willingness

Katsina's population, projected at approximately 10.37 million in 2022 [10], remains largely uninsured. A state-level survey in 2023 found that less than 0.5% of residents had any form of health insurance [13]. Meanwhile, Mutual Health Associations (MHAs)—which represent the main form of CBHI in the state—cover only 41,219 members, roughly 0.4% of the population. This huge coverage gap highlights the urgency of implementing new strategies. Yet, there is clear demand. In a 2016 survey conducted in Batagarawa LGA [14], 90.5% of households expressed willingness to enroll in a CBHI scheme, with many willing to pay ₦100 per person monthly. This indicates that financial cost may not be the primary barrier; rather, gaps in awareness, trust, and accessibility are major constraints. With the right outreach and structure, enrollment could increase rapidly.

Table 1 provides a sample of community enrollment data.

Table 1. Sample Community Enrollment Data

Region	Population	Enrollment (%)
Urban	3,500,000	12.5
Rural	5,700,000	2.3
Total	9,200,000	5.4

Poverty and Equity Considerations

The 2024 Katsina Inclusive Economic Policy [10] reports that 66.7% of the population is multidimensionally poor, lacking access to quality health care, education, and income. This further underscores the need for premium subsidies and targeted enrollment campaigns. Many cannot afford even minimal contributions without financial assistance. Leveraging the federal Basic Health Care Provision Fund (BHCPF) to support these populations can improve equity and accelerate UHC.

Impact on Health Utilization

Evidence from other Nigerian states and international settings shows that insurance enrollment improves health service utilization. For example, insured individuals are more likely to seek care early, utilize primary health facilities, and adhere to prescribed treatments. A comparative study found that in CBHI-covered communities, health facility use increased by over 30%, while out-of-pocket expenditures declined significantly [19]. Similar outcomes can be expected in Katsina if coverage is expanded.

Monitoring and Evaluation

Finally, state-level insurance expansion requires continuous monitoring. Using digital dashboards and periodic surveys, Katsina can track key indicators: number of enrollees, service utilization, satisfaction, and dropout rates. This data-driven approach allows for mid-course corrections and ensures accountability at all levels—from community health workers to the state health insurance agency.

In summary, the data affirm that expanding health insurance in Katsina is both necessary and feasible. The key lies in leveraging existing demand, supporting the poorest, strengthening governance, and institutionalizing community participation. If scaled thoughtfully, these actions can help Katsina become a model for UHC in Nigeria.

Conflict of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

Ethical Approval

Ethical considerations were central to the design and implementation of this study, ensuring that the rights and well-being of participants were protected throughout the research process. The study adhered to the ethical principles of voluntary participation, informed consent, confidentiality, and anonymity. These principles were operationalized through several measures, including obtaining ethical approval, securing informed consent, and ensuring the confidentiality of participants' data.

Data Availability

The qualitative data sets generated and analyzed during the current study (comprising transcribed Focus Group Discussions) are not publicly available due to the need to ensure the **confidentiality and anonymity** of the study participants and key informants. The full data may contain sensitive identifiers or contextual information that could potentially breach the informed consent agreement. However, the data are available from the corresponding author upon reasonable request and subject to review by the relevant institutional ethical committee.

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References

[1]. Bashar, J. M., Onoja, P. A., Nduka, F. O., et al., 2025, Charting the path to the implementation of universal health coverage policy in Nigeria through the lens of Delphi methodology. *BMC Health Services Research*, 25:45. https://doi.org/10.1186/s12913-024-12201-7

[2]. Eze, O. I., Iseolorunkanmi, A., Adeloye, D., 2024, The National Health Insurance Scheme (NHIS) in Nigeria: current issues and implementation challenges. *Journal of Global Health Economics and Policy*, 4:e2024002. https://doi.org/10.52872/001c.120197

[3]. Abubakar, I., Dalglish, S. L., Angell, B., Sanuade, O., Abimbola, S., et al., 2022, The Lancet Nigeria Commission: investing in health and the future of the nation. *Lancet,* 399(10330):1155–1200. https://doi.org/10.1016/S0140-6736(21)02488-0

[4]. Ojielo, N. C., Etiaba, E., Onwujekwe, O., 2024, To what extent do community members participate in planning, implementing health programs within their communities and what are the benefits of their participation in Nigeria? *International Journal of Community Medicine and Public Health,* 11(7). https://doi.org/10.18203/2394-6040.ijcmph20241804

[5]. Odeyemi, I. A., 2014, Community-based health insurance programmes and the National Health Insurance Scheme of Nigeria: challenges to uptake and integration. *International Journal for Equity in Health*, 13:20. https://doi.org/10.1186/1475-9276-13-20

[6]. World Health Organization., 2025, Community-Based Health Insurance (CBHI) Fact Sheet (31 March 2025). *WHO Newsroom*.

[7]. News Agency of Nigeria., 2024, Dec. 16, NHIA: Nigeria exceeds 2024 health insurance target, hits 95% of 2027 goal. *The Gazette (Abuja).* https://gazettengr.com/nhia-nigeria-exceeds-2024-health-insurance-target

[8]. Oluedo, E. M., Obikeze, E., Nwankwo, C., Okonronkwo, I., 2023, Willingness to enroll and pay for community-based health insurance among rural households in Enugu State, Southeast Nigeria. *Nigerian Journal of Clinical Practice*, 26(7):908–920. https://doi.org/10.4103/njcp.njcp_612_22

[9]. Lawal, A., Gobir, A. A., Aliyu, A., Sufiyan, M. B., 2020, Community-based health insurance scheme in a rural community of north-west Nigeria: a roadmap to achieving universal health coverage. *Kanem Journal of Medical Sciences*, 14(2):124–130. https://doi.org/10.36020/kjms.2020.1402.004

[10]. Katsina State Government., 2024, Inclusive Economic Policy 2024–2034. Directorate of Economic Planning, *Katsina State*. https://katsinastate.gov.ng/wp-content/uploads/2024/12/Katsina-State-Inclusive-Economy-Policy-2.pdf

[11]. Federal Ministry of Health (Nigeria)., 2017, Second National Strategic Health Development Plan (NSHDP II) 2018–2022. Abuja: *Federal MOH*.

[12]. Yahaya, S. S., Mustapha, M., Lawal, N., Runka, J. Y., 2022, Knowledge of community-based health insurance among residents of Katsina State, Nigeria: a comparative cross-sectional study. *Texila International Journal of Academic Research – Special Edition*.

[13]. Suleiman, Y. S., Mustapha, M., Lawal, N., Runka, J. Y., 2022, Utilization of community-based health insurance among residents of Katsina State, Nigeria: a comparative cross-sectional descriptive study. *Texila International Journal of Public Health*, 10(4).

[14]. National Bureau of Statistics & UNICEF., 2017, Nigeria Multiple Indicator Cluster Survey 2016–17. Abuja: NBS/UNICEF.

[15]. World Bank., 2023, World Development Indicators: Nigeria.

[16]. WHO & World Bank., 2015, Tracking Universal Health Coverage: First Global Monitoring Report. *Geneva: WHO*.

[17]. Adinma, E. D., Adinma, J. I., 2010, Community-based healthcare financing: An untapped option to more effective healthcare funding in Nigeria. *Nigerian Medical Journal*, 51(3):95–100.

[18]. Onwujekwe, O. E., et al., 2010, Willingness to pay for CBHI in Nigeria: Do economic status and location matter? *Health Policy and Planning*, 25(2):155–161. https://doi.org/10.1093/heapol/czp046

[19]. Ekman, B., 2004, CBHI in low-income countries: contribution to health financing performance. *Tropical Medicine & International Healt*h, 9(8):799–811.

[20]. Carrin, G., Waelkens M.P., Criel B., 2005, CBHI in developing countries: its contribution to health financing performance. *Tropical Medicine & International Health*, 10(5):799–811.

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Challenges in Accessing NHIA Services among Formal and Informal Sector Workers in Kano, Nigeria

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Abstract

Nigeria's National Health Insurance Authority (NHIA) aims to achieve universal health coverage (UHC), yet persistent inequities in access between formal and informal sector workers who constitute over 80% of the workforce remain poorly understood. The aim of this study is to compare challenges faced by formal and informal sector enrollees in accessing NHIA services in Kano, Nigeria, and identify systemic gaps to inform policy reforms. A cross-sectional comparative study of 440 NHIA enrollees (205 formal, 235 informal) across all 44 Local Government Areas in Kano State was conducted. Eligible participants were adults (≥18 years) enrolled for ≥6 months who had accessed care within the past 3 months. Data were collected via structured questionnaires and in-depth interviews. Primary outcomes included self-reported challenges in accessing NHIA services, analyzed by sector (formal/informal). Secondary outcomes included specific barriers (e.g., service codes, coverage limitations) and qualitative themes (e.g., operational delays). Chi-square tests assessed associations. Among 440 enrollees, 71.6% reported challenges, with informal sector workers disproportionately affected (87.7% vs 53.2%; $\chi^2=64.03$, P*<0.001). Key barriers included difficulty obtaining service codes (38.0% informal, 41.4% formal), inadequate service coverage (9.6% vs 28.4%), poor customer service (12.2% vs 7.9%), and low awareness of benefits (14.6% vs 7.0%). Qualitative data highlighted operational inefficiencies (e.g., long wait times, unclear communication) as compounding factors. This study reveals significant disparities in NHIA access, with informal sector enrollees facing systemic barriers. Policy priorities should address administrative bottlenecks, expand service coverage, and strengthen community-based awareness campaigns to advance equitable UHC in Nigeria.*

Keywords*: Health Insurance, Informal Sector, NHIA, Nigeria, Universal Health Coverage.*

Introduction

Persistent inequities in financial protection remain a central challenge to achieving universal health coverage (UHC) in Nigeria [1]. Despite repeated global commitments most notably the 1978 Alma-Ata Declaration and the Sustainable Development Goals, access to affordable, quality healthcare continues to elude large segments of Nigeria's population, particularly those outside the formal employment sector [2]. Although UHC aims to ensure that all individuals receive essential health services without incurring financial hardship, out-of-pocket (OOP) payments still account for over 70% of total health expenditure in Nigeria, one of the highest proportions in sub-Saharan Africa [2, 3]. This over-reliance on OOP spending has contributed to delayed care-seeking, unmet health needs [4], and catastrophic health expenditures (CHE), often pushing households into poverty [5, 6].

The Nigerian healthcare system reflects broader global patterns of inequality, wherein

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access to care is shaped by income level, geographic location, and employment status [7, 8]. Wealthier urban residents are more likely to access adequately staffed facilities with essential supplies, whereas rural and low-income populations often contend with under-resourced public clinics or resort to self-medication and informal care [2, 5, 8]. To address these disparities, Nigeria introduced the National Health Insurance Scheme (NHIS) in 2005 to improve health financing, reduce OOP payments, and promote risk pooling. However, structural limitations such as its voluntary nature, narrow risk pool, and focus on federal employees hampered the scheme's reach and sustainability [7, 9].

Recognizing these shortcomings, the Federal Government enacted the National Health Insurance Authority (NHIA) Act in 2022, which replaced the NHIS and mandated coverage for all Nigerians [10]. Key innovations under the NHIA include decentralization of scheme implementation to subnational levels, greater emphasis on strategic purchasing, and an expanded role for states and private actors in enrolling the informal sector. These reforms were intended to align Nigeria's health financing architecture more closely with the WHO UHC cube, which emphasizes coverage across three dimensions: population inclusion, service availability, and financial protection [11, 12].

Yet, more than a year after the NHIA Act's passage, fewer than 10% of Nigerians are enrolled in any health insurance scheme, with formal sector workers particularly federal employees accounting for most beneficiaries through automatic payroll deductions [12, 13]. In contrast, Nigeria's large informal workforce, which constitutes over 80% of total employment, remain largely uninsured [14-16]. Barriers to enrollment among informal workers include income instability, limited awareness, mistrust of scheme benefits, and difficulties navigating registration procedures [17-19]. Moreover, even among those enrolled, satisfaction with NHIA services varies considerably, influenced by factors such as long wait times, limited provider choice, drug stockouts, and perceptions of poor service quality [20-22].

Despite increasing attention to health financing reforms in Nigeria, few empirical studies have systematically compared health insurance enrollment, utilization, and satisfaction across formal and informal sector workers. These groups differ not only in terms of income and job security but also in how they engage with and experience the health system. Without disaggregated analysis, equity gaps may remain obscured, undermining policy responses.

Access to care remains uneven, particularly for informal sector workers, due to affordability, location, and awareness constraints. The NHIA, formerly the National Health Insurance Scheme (NHIS), was established to promote universal health coverage in Nigeria. However, participation remains skewed toward formal sector workers due to payroll-based registration and structural barriers that limit informal sector enrollment, including the irregularity of income and limited awareness [4, 19, 23] of the Group, Individual and Family Social Health Insurance Programme (GIFSHIP) platform for self-enrolment or group enrolment [22].

To address this gap, the present study examines differences in NHIA enrollment, healthcare access, and satisfaction between formal and informal sector workers in Kano State, a populous and socioeconomically diverse region in Northern Nigeria that reflects the broader challenges of UHC implementation. Grounded in equity-focused frameworks such as the WHO UHC cube and Andersen's Behavioral Model of Health Services Use [24, 25], the study identifies sector-specific barriers and facilitators of NHIA participation. The findings are intended to inform adaptive strategies for equitable expansion of NHIA coverage, particularly among informal workers,

and contribute to evidence-based policymaking in Nigeria and comparable low- and middle-income countries [11, 26].

Methods

Study Design and Setting

This was a cross-sectional comparative study conducted among National Health Insurance Authority (NHIA) enrollees who had accessed outpatient care in Kano State, Nigeria. Kano is Nigeria's most populous state, with an estimated population of over 15 million in 2024 based on extrapolations from the most recent national census conducted in 2006. Located in the northwest geopolitical zone, the state shares borders with Katsina, Jigawa, Bauchi, and Kaduna states. Kano City, the state capital, is Nigeria's largest urban centre and an important commercial and cultural hub.

Administratively, Kano comprises 44 Local Government Areas (LGAs), including 8 urban and 36 rural LGAs. The economy is largely driven by informal sector activity, including small-scale trade, repair services, and agriculture. Formal sector employment, though limited, consists primarily of civil service and private-sector jobs.

The health infrastructure in Kano State includes two federal tertiary hospitals, three state-owned teaching hospitals, 35 secondary facilities (33 state-run, 2 federal), 22 primary health care centres, seven military health institutions, and 72 NHIA-accredited private hospitals.

Participants and Eligibility Criteria

Participants were stratified into two categories: (1) formal sector enrollees-government and private-sector employees enrolled via employer payroll contributions; and (2) informal sector enrollees-self-employed individuals registered through the NHIA's Group, Individual and Family Social Health Insurance Programme (GIFSHIP).

Eligibility criteria included adults aged 18 years or older, enrolled in the NHIA scheme for at least six months, and who had accessed outpatient care at a NHIA-accredited facility within the three months preceding data collection. The three-month criterion was used to minimise recall bias regarding service utilisation. Only one respondent per household was enrolled to avoid duplicate data from intra-household clustering.

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies [27].

Sample Size Determination

The minimum required sample size was calculated using the formula for comparing two proportions [28, 29]:

$$n = \left[\left(Z_2^{\alpha} + Z_{\beta}\right)^2 . \left(p_1\,(1-p_1) + p_2(1-p_2)\right) / (p_1 - p_2)^2\right.$$

Where:

- $Z_{\alpha/2}$=1.96 for 95% confidence
- Z_{β}=0.84 for 80% power
- p_1 and $p_2$were the estimated proportions of NHIA utilisation among formal and informal sector enrollees, based on existing literature and pilot data.

With a 10% adjustment for non-response, a final sample of 440 was determined to be adequate.

Sampling and Data Collection

Participants were selected using a multistage sampling strategy. First, all 44 LGAs in Kano State were included to ensure geographic representation. Within each LGA, NHIA-accredited facilities were randomly selected using a sampling frame provided by the Kano NHIA office. At the facility level, systematic sampling was used to recruit eligible enrollees proportionately across formal and informal sector registries.

Data were collected using a pretested, structured interviewer-administered questionnaire adapted from the NHIA evaluation toolkit. Information captured included socio-demographic characteristics,

NHIA enrolment history, recent service utilisation, satisfaction indicators, and perceived barriers to care. Data were collected by trained enumerators using tablets loaded with Open Data Kit (ODK) software.

Ethical Considerations

Ethical approval was obtained from the Kano State Ministry of Health Ethics Committee. Additional permissions were granted by the NHIA Kano Office, Aminu Kano Teaching Hospital, Kano State Hospital Management Board, and Texila American University. All participants provided written informed consent prior to enrolment. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Statistical Analysis

Data were analysed using IBM SPSS version 25. Descriptive statistics (means, medians, proportions) were used to summarise variables. Differences between formal and informal sector groups were assessed using chi-square tests for categorical variables and t-tests or Mann-Whitney U tests for continuous variables. Multivariate logistic regression was used to identify predictors of satisfaction and health care utilisation, adjusting for potential confounders. Statistical significance was set at a 2-sided alpha level of 0.05.

Results

Sociodemographic Characteristics

A total of 440 NHIA enrollees participated in the study, comprising 205 from the formal sector and 235 from the informal sector. Males predominated in both groups (64.4% formal; 59.1% informal). The mean age of informal enrollees (43.4 ± 8.7 years) was significantly higher than that of formal sector participants (39.5 ± 10.5 years; $p < 0.05$), with most respondents aged 30–49 years.

The Hausa ethnic group was the largest in both cohorts (64.9% formal; 51.4% informal; $p < 0.001$), and Islam was the predominant religion (90.2% formal; 85.5% informal). Marital status varied slightly, with 79.0% of formal and 72.0% of informal respondents being married ($p < 0.001$) as seen in "Table 1".

Table 1. Socio-Demographic Characteristics of Respondents

Variable		Formal n(%)	Informal n(%)	χ2	p-value
Type of facility	Federal Tertiary	61(29.8)	61(25.9)	5.87	0.21
	State Tertiary	61(29.8)	61(25.9)		
	State Secondary	10(4.9)	10(4.3)		
	Private	71(34.6)	103(43.8)		
	PHC	2(0.9)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Gender	Male	132(64.4)	139(59.1)	1.27	0.28†
	Female	73(35.6)	96(40.9)		
	Total	205(100.0)	235(100.0)		
Age group(years)	18-24	14(6.8)	5(2.1)	37.52	<0.001*
	25-34	66(32.2)	31(13.2)		
	35-44	70(34.1)	104(44.3)		
	45-54	35(17.1)	77(32.8)		
	≥55	20(9.8)	18(7.7)		
	Total	205(100.0)	235(100.0)		

Ethnic group	Hausa	133(64.9)	130(51.4)	20.64	<0.001*
	Fulani	30(14.6)	61(36.0)		
	Yoruba	27(13.2)	31(13.2)		
	Igbo	3(1.5)	11(4.7)		
	Others	12(5.8)	2(0.9)		
	Total	205(100.0)	235(100.0)		
Religion	Islam	185(90.2)	201(85.5)	2.26	0.15†
	Christianity	20(9.8)	34(14.5)		
	Total	205(100.0)	235(100.0)		
	Single	28(13.7)	26(11.1)	11.10	<0.001*
	Married	162(79.0)	169(72.0)		
	Divorced	11(4.4)	34(10.2)		
	Widow	4(2.0)	5(2.1)		
	Separated	0(0.0)	1(0.4)		
	Total	205(100.0)	235(100.0)		
No. of Children	None	36(17.6)	39(16.6)	23.30	<0.001*
	≤2	45(22.0)	33(14.0)		
	3	48(23.4)	79(33.6)		
	4	32(15.6)	60(25.5)		
	5	19(9.3)	14(6.0)		
	≥6	25(12.2)	10(4.3)		
	Total	205(100.0)	235(100.0)		

**= Significant at p<0.05*

†=Fisher exact test

Household and Employment Characteristics

Polygamous households were significantly more common among informal enrollees (43.5%) than formal enrollees (14.7%; $p < 0.001$). The majority of formal sector respondents resided in urban areas (95.1%), compared to 82.1% in the informal group ($p < 0.001$).

Educational attainment was generally higher among formal participants, with 51.2% holding a diploma or bachelor's degree and 8.9% reporting postgraduate education. Although 69.8% of informal workers had some form of tertiary education, only 3.4% had postgraduate degrees ($p = 0.002$). Income disparities were evident: 71.9% of informal enrollees earned ₦51,000–₦200,000 monthly, whereas 19.0% of formal workers earned less than ₦10,000 ($p < 0.001$). These data is displayed in "Table 2".

Table 2. Socio-Demographic Characteristics of Respondents

Variable		**Formal n(%)**	**Informal n(%)**	**χ2**	**p-value**
Type of family	Polygamy	26(14.7)	91(43.5)	37.77	<0.001†
	Monogamy	151 (85.3)	118(56.5)		
	Total	177(100.0)	209(100.0)		
	Urban	195(95.1)	193(82.1)	17.74	<0.001†

Place of Residence	Rural	10(4.9)	42(17.9)		
	Total	205(100.0)	235(100.0)		
Level of Education	No formal	2(9.8)	2(0.9)	19.29	0.002*
	Primary	4(2.0)	2(0.9)		
	Secondary	52(25.4)	34(14.5)		
	Voc/Technical	24(11.7)	25(10.6)		
	Diploma/Bachelor	105(51.2)	164(69.8)		
	Postgraduate	18(8.9)	8(3.4)		
	Total	205(100.0)	235 (100.0)		
Income (Naira)	<10,000	39(19.0)	11(4.7)	38.82	<0.001*
	10,000-50,000	53(25.9)	37(15.7)		
	51,000-100,000	59(28.8)	88(37.4)		
	101,000-200,000	37(18.0)	81(34.5)		
	≥201,000	17(8.3)	18(7.7)		
	Total	205(100.0)	235(100.0)		
Duration employed (years)	<1	28(13.7)	12(5.1)	21.36	<0.001*
	1-5	65(31.7)	64(27.2)		
	6-10	52(25.4)	97(41.3)		
	11-15	31(15.1)	42(17.9)		
	≥16	29(14.1)	20(8.5)		
	Total	205(100.0)	235(100.0)		

**= Significant at p<0.05*

†=Fisher exact test

Employment Type and Occupation

As expected, most formal sector participants were government employees in either junior or senior roles as seen in "Figure 1''.

Informal sector respondents were primarily small-scale traders (53.6%) and artisans, based on self-reported occupation. These are shown in "Figure 2".

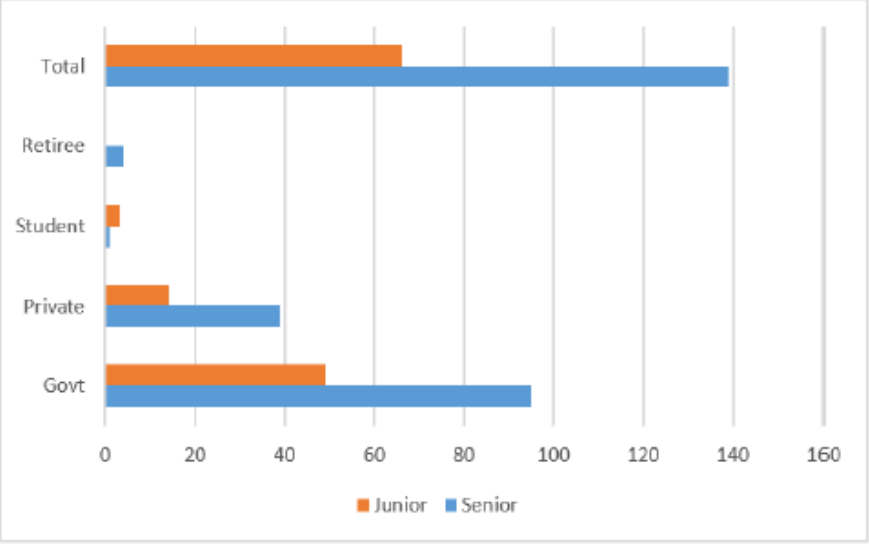

Figure 1. Level and Type of Employment of Formal sector Enrollees

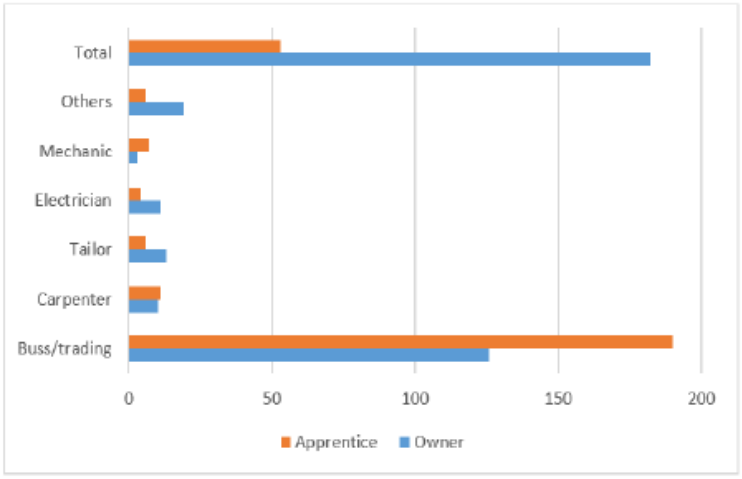

Figure 2. Occupation of the Informal Sector Enrollees

NHIA Awareness and Enrollment Patterns

Awareness of NHIA was high in both groups (87.3% formal; 83.0% informal). Formal enrollees primarily learned about NHIA through their employers (52.2%), whereas informal enrollees relied more on friends and colleagues (50.6%; $p < 0.001$).

Enrollment rates were similarly high (98.5% formal; 97.4% informal). Informal enrollees were more likely to be principal policyholders (83.8% vs. 70.8%; $p = 0.002$), while formal enrollees enrolled a greater number of dependents, with 19.5% enrolling six or more, compared to only 6.0% of informal enrollees ($p < 0.001$). Additionally, 27.6% of formal participants had been enrolled for at least seven years, compared to 5.6% of informal participants ($p < 0.001$).

Challenges in Accessing NHIA Services

Overall, 125 participants reported no challenges with NHIA services, while 315 experienced at least one. Difficulties obtaining service codes were the most common complaint (38.0% informal; 41.4% formal). A significantly higher proportion of informal enrollees reported challenges (87.7%) compared to formal enrollees (53.2%; $\chi^2 = 64.03$, $p < 0.001$).

Formal participants were more likely to cite inadequate coverage (28.4% vs. 9.6%), whereas informal enrollees more often reported poor customer service (12.2% vs. 7.9%) and lack of awareness (14.6% vs. 7.0%). Informal enrollees also reported more frequent issues: 34.9% experienced challenges often, versus 20.5% of formal participants ($\chi^2 = 60.42$, $p < 0.001$). "Table 3", displays this data.

Table 3. Frequency and types of Challenges faced by Respondents

Variable		Formal (n%)	Informal n(%)	χ2	p-value
Faced challenges	Yes	109(53.2)	206(87.7)	64.03	0.00†
	No	96(46.8)	29(12.3)		
	Total	205(100.0)	235(100.0)		
Challenges encountered	Long waiting time	13(6.0)	15(7.3)	183.07	0.00*
	Limited HCF	10(4.7)	18(8.8)		
	Poor customer service	17(7.9)	25(12.2)		

	Inadequate coverage	61(28.4)	20(9.6)		
	Difficulty getting code	89(41.4)	78(38.0)		
	Lack of awareness	15(7.0)	30(14.6)		
	Others	10(4.7)	19(9.3)		
	Total	215(100.0)	205(100.0)		
Frequency of challenges	Always	9(4.4)	20(8.5)	60.42	0.00*
	Frequently	42(20.5)	82(34.9)		
	Occasionally	48(23.4)	101(43.0)		
	Rarely	10(4.9)	3(1.3)		
	Never	96(46.8)	29(12.3)		
	Total	205(100.0)	235(100.0)		

**Statistically significant*

†=Fisher exact test

Qualitative Insights: Barriers and User Experience

Thematic analysis of open-ended responses reinforced these quantitative findings. Informal enrollees described greater structural and operational barriers, including time delays, facility shortages, and lack of clarity on benefits. A recurring theme was frustration with inefficiencies:

"*It's time-consuming—you end up wasting the whole day*."

"*You don't get full service, even when you do everything right*."

Formal sector respondents more frequently cited administrative hurdles and operational inefficiencies.

"*Network problem... sometimes drugs are not available, so care is incomplete*." "*Hard to change dependents, I wanted to remove one of my child and put another child instead. They referred me somewhere far and it took time before it was ready*."

Both groups reported high awareness and saw the enrollment process as fundamentally straightforward, although many noted bureaucratic delays when updating policy details.

Cultural or religious barriers to NHIA use were minimal. Respondents consistently indicated that religious beliefs supported healthcare access, and none reported stigma attached to using NHIA services.

Affordability was cited as a strength of the scheme, with both groups describing NHIA contributions as "*very affordable*." However, experiences with service quality and grievance redress were mixed. While some formal participants reported rapid resolution of complaints, informal enrollees noted that complaints were often acknowledged but not addressed.

Discussion

This study explored differences in National Health Insurance Authority (NHIA) awareness, enrolment patterns, and service access challenges between formal and informal sector enrollees in Kano, Nigeria. The findings highlighted important disparities in sociodemographic characteristics, enrolment dynamics, user experience, and perceptions of NHIA service delivery.

Sociodemographic and Occupational Differences

As expected, formal sector respondents were younger, more urban-based, and more likely to hold government positions. Their higher proportion of postgraduate education aligns

with public service employment patterns in Nigeria. Informal sector participants, despite a relatively high level of tertiary education, showed less postgraduate attainment and greater occupational diversity, reflecting the non-standardized and heterogeneous nature of the informal economy. The significant prevalence of polygamous households among informal enrollees (43.5%) may reflect broader cultural and socioeconomic patterns that affect health service access, household health needs, and NHIA utilization [30-32].

NHIA Awareness and Enrolment Patterns

High awareness of NHIA in both groups (>80%) is encouraging and reflects the scheme's reach since its inception. However, information sources differed markedly: formal enrollees predominantly learned about the scheme through institutional channels (e.g., employers), whereas informal workers relied heavily on peer networks. This underscores the need for tailored awareness strategies to reach informal workers, including community-based campaigns, market associations, and local influencers [33-35].

Despite broadly similar enrolment rates, significant disparities emerged in coverage scope. Informal enrollees were more often principal subscribers, but they enrolled fewer dependents and had shorter enrolment duration likely reflecting weaker financial capacity and less exposure to scheme benefits over time. These findings align with previous studies that have found lower NHIS uptake and continuity among informal sector groups due to limited awareness of benefits and affordability constraints [4, 7, 13].

Challenges in Accessing NHIA Services

More than 80% of informal enrollees reported experiencing challenges in accessing NHIA services substantially higher than among their formal counterparts. The most frequently cited issue in both groups was difficulty obtaining service codes, reflecting persistent bottlenecks in authorization and claims processing systems. However, the nature and frequency of challenges differed. Informal enrollees reported significantly more structural and service-related problems, including poor customer care, long waiting times, and poor communication about entitlements. These challenges were corroborated by qualitative data, where informal sector users voiced frustration with long wait times, unclear benefit packages, and lack of staff responsiveness. Their narratives reflect broader structural issues affecting access and equity within the NHIA scheme. Similar findings were found in other studies [36-38].

Formal sector respondents, on the other hand, more often highlighted administrative inefficiencies such as referral delays and challenges with updating dependent information. Despite these, they reported greater satisfaction with complaint resolution a reflection of stronger institutional ties and perhaps more robust grievance redress mechanisms within the formal system.

Implications for Health Equity and Policy

The findings underscore a critical health equity concern: while the NHIA aims to provide universal coverage, the informal sector comprising the majority of Nigeria's workforce continues to face disproportionate barriers. This discrepancy threatens to entrench healthcare access inequities, especially as informal workers often lack financial protections and employer support.

Policy reforms must prioritize equity-focused strategies. These include: (1) decentralized, user-friendly enrolment and grievance redress platforms; (2) community-based sensitization campaigns leveraging peer networks; and (3) increased investment in primary care infrastructure serving informal workers. The success of the NHIA's expansion

depends on addressing these structural deficits. [39, 40].

Strengths and Limitations

A key strength of this study lies in its comparative design and integration of both quantitative and qualitative data, which enhanced explanatory power. However, the study was conducted in a single state, limiting generalizability. Moreover, self-reported responses may be subject to recall or social desirability bias.

Conclusion

While awareness and enrolment in NHIA are high in both sectors, informal enrollees face greater challenges in accessing services, navigating processes, and securing redress. Without structural improvements and equity-sensitive reforms, the NHIA risks reinforcing the very disparities it seeks to eliminate.

Conflict of Interest

There is no conflict of interest.

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References

[1]. Okpani, A. I., Abimbola, S., 2015, Operationalizing universal health coverage in Nigeria through social health insurance. *Nigerian Medical Journal*, 56 (5), 305–310.

[2]. Flannery, D., Garvey, J., Inyang, U., 2020, The financial protection of national health insurance: Evidence from a cross section of State and Federal workers in Akwa Ibom, Nigeria, 10(3).

[3]. Okunogbe, A., Hähnle, J., Rotimi, B. F., Akande, M., T., Wendy, J., 2022, Short and longer-term impacts of health insurance on catastrophic health expenditures in Kwara State, Nigeria. *BMC Health Services Research*, 22 (1), 1-18.

[4]. Adewole, D. A., Adebayo, A. M., Udeh, E. I., Shaahu, V. N., Dairo, M. D., 2015, Payment for health care and perception of the national health insurance scheme in a rural area in Southwest Nigeria American Journal of Tropical Medicine and Hygiene. *American Journal of Tropical Medicine and Hygiene*, 93(3), 648-654.

[5]. Aregbeshola, B. S., Khan, S. M., 2018, Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. Int J Health Policy Manag, 7(9), 798–806.

[6]. Amakom, U., Ezenekwe, U., 2012, Implications of households catastrophic out of pocket (OOP) healthcare spending in Nigeria. *Journal of Research in Economics and International Finance (JREIF)*, 1(5), 136-140.

[7]. Onwujekwe, O., Onoka, C., Uzochukwu, B., Hanson, K., 2011, Constraints to universal coverage: Inequities in health service use and expenditures for different health conditions and providers. *International Journal for Equity in Health*, 10(50), 1-9.

[8]. Aregbeshola, B. S., Khan, S. M., 2018, Predictors of enrolment in the National Health Insurance Scheme among women of reproductive age in Nigeria. *International Journal of Health Policy and Management*, 7(11), 1015-1023. http://ijhpm.com *Int J Health Policy Manag.* 2018, 7(9), 798–806.

[9]. Eteng, F. O., Ijim-Agbor, U., 2016, Understanding the challenges and prospects of administering the national health insurance scheme in Nigeria. *International Journal of Humanities and Social Science Research*, 2 (8), 43–48.

[10]. Federal Republic of Nigeria, National Health Insurance Authority. Federal Republic of Nigeria Official Gazette, Act of 2022, No. 95, Government Notice No. 73, Vol. 109.

[11]. Adewole, D. A., Osungbade, K. O., 2016, Nigeria National Health Insurance Scheme: A highly subsidized health care program for a privileged few. *International Journal of Tropical Disease & Health*, 19 (3), 1–11.

[12]. Odonkor, S. N. N. T., Koranteng, F., Appiah-Danquah, M., Dini, L.,2023, Do national health insurance schemes guarantee financial risk protection in the drive towards Universal Health Coverage in West Africa? A systematic review of observational studies. *PLOS Global Public Health*, 3 (8).

[13]. Osunde, R. N., Olurunfemi, O., Oduyemi, R. O., 2023, Awareness, willingness, and challenges of the informal sector towards state national health insurance services in Benin City, Nigeria. *MGM J Med Sci*, 10(30) 30-37.

[14]. Omotosho, O., Ichoku, H. E., 2016, Distributional analysis of household health expenditure in Nigeria. *Developing Country Studies*, 6 (9), 111–120.

[15]. Omotosho, O., Ichoku, H. E., 2016, Financial protection and universal health coverage in Nigeria. *International Affairs and Global Strategy*, 51, 5–14.

[16]. Adewole, D. A., Dairo, M. D., Bolarinwa, O. A., 2016, Awareness and coverage of the National Health Insurance Scheme among formal sector workers in Ilorin, Nigeria. *African Journal of Biomedical Research*, 19 (1), 7–16.

[17]. Akinyemi, O. O., Owopetu, O. F., Agbejule, I. O., 2021, National Health Insurance Scheme: Perception and participation of federal civil servants in Ibadan. *Annals of Ibadan Postgraduate Medicine*, 19 (1), 49–55.

[18]. Alawode, G., Adewole, A., 2021, Assessment of the design and implementation challenges of the National Health Insurance Scheme in Nigeria: a qualitative study among sub-national level actors, healthcare and insurance providers. *BMC Public Health*, 21 (124).

[19]. Bolarinwa, O. A., Afolayan, M. A., Rotimi, B. F., Alatishe-Mohammad, B., 2021, Are there evidence to support the informal sector's willingness to participate and pay for statewide health insurance scheme in Nigeria? *Niger Postgrad Med J*, 28, 71-3.

[20]. Adewale, B., Adeneye, A. K., Ezeugwu, S. M. C., Afocha, E. E., Musa, A. Z., Enwuru, C. A., et.al., 2016, A preliminary study on enrollees perception and experiences of National Health Insurance Scheme in Lagos State, Nigeria. *Int J Trop Dis Health*, 18(3), 1–14.

[21]. Daramola, O. E., Adeniran, A., Akande, T. M., 2018, Patients' Satisfaction with the Quality of Services accessed under the National Health Insurance Scheme at a Tertiary Health Facility in FCT Abuja, *Nigeria. Journal of Community Medicine and Primary Health Care*, 30 (2), 90-97.

[22]. Nwanaji-Enwerem, O., Bain, P., Marks, Z., Nwanaji-Enwerem, P., et.al. 2022, Patient satisfaction with the Nigerian National Health Insurance Scheme two decades since establishment: A systematic review and recommendations for improvement. *African Journal of Primary Health Care and Family Medicine*, 14, 1-10.

[23]. Azuogu, B. N., Madubueze, U. C., Alo, C., Ogbonnaya, L. U., Ajayi, N. A., 2016, Level of awareness, and factors associated with willingness to participate in the National Health Insurance Scheme among traders in Abakaliki main market, Ebonyi State, Nigeria. *African Journal of Medical and Health Sciences*, 15(1), 18-23.

[24]. Solanke, B. L., Yinusa, R. A., Oyeleye, O. J., Oluwatope, O. B., Ilesanmi, B. B., Oni, T. O., 2023, Using Andersen's behavioral model of health care use for intermittent preventive treatment of malaria in pregnancy in Nigeria. *BMC Pregnancy Childbirth*, 23(332).

[25]. Kumah, E., Asana, Y., Agyei, S. K., Kokuro, C., Ankomah, S. E., Fusheini, A., 2024, Does health insurance status influence healthcare-seeking behavior in rural communities? Evidence from rural Ghana. *BMC Health Serv Rev, 2*4(655).

[26]. Ainy, A., Pujiyanto, 2022, Determinant of health insurance enrollment for the informal sector in low and middle-income countries: A systematic review. *Proceedings of the International Conference on Public Health*, 7 (2), 37-52.

[27]. von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., 2007, STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *PLoS Med*, 4(10).

[28]. Lwanga, S. K., Lemeshow, S., 1991, Sample Size Determination in Health Studies: A Practical Manual. Geneva: *World Health Organization.*

[29]. Magnani, R., 1997, Sampling guide. IMPACT Food Security and Nutrition Monitoring Project. Arlington, *VA: International Science and Technology Institute*.

[30]. Umar, N., Mohammed, S., 2011, Insured persons' dilemma about other family members: a perspective on the national health insurance scheme in Nigeria. *J Public Health Afr*. 22(2).

[31]. Mohammed, S., Sambo, M. N., Dong, H., 2011, Understanding client satisfaction with a health insurance scheme in Nigeria: factors and enrollees' experiences. *Health Res Policy Syst*, 9(20).

[32]. Mohammed, S., Aji, B., Bermejo, J. L., Souares, A., Dong, H., Sauerborn, R., 2016, User experience with a health insurance coverage and benefit-package access: implications for policy implementation towards expansion in Nigeria. *Health Policy Plan*. 31(3), 346-355.

[33]. Lawan, U. M., Iliyasu, Z., 2012, Challenges to the scale-up of the Nigerian National Health Insurance Scheme: Public knowledge and opinions in urban Kano, Nigeria. *Ann Trop Med Public Health*. 5(1), 6-11.

[34]. Adewole, D. A., Akanbi, S. A., Osungbade, K. O., Bello, S., 2017, Expanding health insurance scheme in the informal sector in Nigeria: awareness as a potential demand-side tool. *Pan Afr Med J*, 27(52).

[35]. Demilade, O. I., Olusegun, E. E., Tope, M. I., Stella, A., Eyitayo, E., Paul, O. A., 2012, Awareness and willingness to pay for community health scheme among rural households in Ekiti, Nigeria. *Pacific Journal of Medical Sciences*, 22(1), 37-50.

[36]. Iliyasu, Z., Abubakar, I. S., Abubakar, S., Lawan, U. M., Gajida, A. U., 2010, Patients' satisfaction with services obtained from Aminu Kano Teaching Hospital, Kano, Northern Nigeria. *Nigerian Journal of Clinical Practice*, 13(4), 371-378.

[37]. Onyedibe, K. I., Goyit, M. G., Nnadi, N. E., An evaluation of the National Health Insurance Scheme (NHIS) in Jos, a north-central Nigerian city. *Global Advanced Research Journal of Microbiology*, *1*(1), 5-12.

[38]. Kofoworola, A. A., Ekiye, A., Motunrayo, A. O., Adeoye, A. T., Adunni, M. R., 2020, National Health Insurance Scheme: An assessment of service quality and clients' dissatisfaction. *Ethiop J Health* Sci.30 (5), 795-802.

[39]. Onasanya, A. A., 2020, Increasing health insurance enrolment in the informal economic sector. *J Glob Health*, 10(1).

[40]. Barasa, E. W., Mwaura, N., Rogo, K., Andrawes, L., 2017, Extending voluntary health insurance to the informal sector: experiences and expectations of the informal sector in Kenya. *Wellcome Open Research*, 94 (1).

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Exploring the Influence of Recognition on Employee Motivation at the Parliament Office of Guyana

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Abstract

This paper explores the influence of recognition on employee motivation at the Parliament Office of Guyana. In doing so, Maslow's Hierarchy of Needs Theory and Herzberg's Two-Factor Theory were examined. Both theories underscore the importance of recognition on motivation, fulfilling esteem needs and being a critical motivator. This paper also examines the resulting effects of recognition on motivation and performance of the employees of the Parliament Office of Guyana. To this end, 110 workers were surveyed with the use of questionnaire containing closed-ended questions. The findings were clear, revealing that 78% of the respondents agree that recognition influences motivation. The types of recognition discussed encapsulate verbal praise, written praise, and milestone recognition, which were the prominent ones selected by the respondents. In addition, recognition positively correlated with heightened performance, the use of greater initiative, and employee loyalty to the workplace. The findings of this research are in keeping with the major theories explained in this paper, further solidifying the importance of non-monetary recognition programmes in public sector institutions. In conclusion, the implementation of wholistic employee recognition programmes in the Parliament Office of Guyana has the capacity to make employees feel valued, motivating them and boosting their performance, which will redound to the benefit of the Parliament of Guyana and the Guyanese citizenry at large.

Keywords: *Employee Motivation, Parliament Office, Performance, Recognition.*

Introduction

Recognition has long been identified as a factor which motivates employees. Recognition is described as "the acknowledgment of an individual's contribution, efforts, or achievements, typically in a timely and sincere manner" [1].

Both Maslow's Hierarchy of Needs Theory and Herzberg's two-Factor Theory highlight that recognition is vital to motivation. For Maslow, recognition forms part of his esteem needs, which result in employees feeling valued at the workplace. Herzberg, on the other hand, believe that recognition forms part of motivators and motivated employees usually perform better.

Recognition can sometimes be earned but not given. It is observed by the researcher that there is wide scope for recognition in the Parliament Office which is underutilised. Many employees work beyond the call of duty to execute activities not captured in their job descriptions.

The case study conducted by the author on "effectiveness of motivation on employee performance at the Parliament Office" revealed that majority of the employees indicated that they need motivation to perform. While the study focused on monetary and non-monetary motivation, and monetary dominating the responses as the type needed, nonmonetary factors such as recognition were also highlighted.

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In light of the above-mentioned study, managers and employers must pay attention to the non-monetary factors as well. The study did recommend same. As a result, this study explored one non-monetary factor – recognition. Recognition was selected by majority of the respondents as a motivator for them. By placing emphasis on this factor of recognition, employees can be motivated. Motivated employees drive organisational performance [2], and that is paramount for any parliamentary institution since it is one of the branches of Government, and that redounds to the benefit of the general citizenry.

This research helped to fill the gap of research on recognition as a specific factor that influences motivation. More so, research on this specific factor relating to the Parliament Office of Guyana has not been conducted. It will add to the literature on employee motivation in parliamentary institutions, and, by extension, Government offices.

Objectives of the Research

The objectives of the research were:

1. To explore the effects of recognition on motivation at the Parliament Office of Guyana; and
2. To determine whether motivation by recognition influences performance of employees at the Parliament Office of Guyana.

Review of Literature

Recognition, from time immemorial, has been identified as a critical factor of motivation in various spheres of life, but more particularly in the workplace. Therefore, research on the topic is available and is continuing to be conducted [2]. Maslow and Herzberg acknowleged the importance of recognition on motivation and, as a result, job performance.

Maslow opined that the need of recognition being fulfilled can lead to employees experiencing job satisfaction and will therefore perform to their best [3]. In the same vein, Herzberg, who categorised recognition as a motivator, posited that recognition as a factor of motivation has the capability to result in heightened job satisfaction, and, as a result, exceptional performance [4]. Moreover, McClellan's Acquired Needs Theory affirms the position of Maslow and Herzberg that recognition empowers needs of recognition, belonging or affiliation and others, which serve as major players in motivation and boosting employee performance [5].

Recognition is the act of showing appreciation for the efforts put into the successful completion of tasks by employees. This can be done in many ways, some of which are awards, verbal praises and acknowledgement, whether in private and/or public, and written commendation [2, 6]. These types were positively correlated with employee motivation in a study conducted on 76 employees from varying sectors [2]. Public recognition sustains performance and commitment to the organisation [7]. When the recognition is in keeping with personal values of the employees, motivation does not dwindle; it becomes sustainable [8].

Types of Recognition

Recognition can come in monetary and non-monetary ways. Monetary recognition is a form of acknowledging the commitment and contributions of workers for particular tasks with money. However, for the purpose of this paper, the focus will be on non-monetary recognition. Non-monetary recognition is very effective in increasing employee motivation and performance [9].

Verbal Praise

When employees complete tasks or perform exceptionally, managers tell them how good of a job they have done. This is verbal praise. It can be privately or publicly done and ignites a feeling of appreciation. Verbal praise has been found to make employees feel valued, particularly when that praise is done in a

genuine and swift manner [10]. One such example is a manager openly thanking an employee or commending an employee in a meeting, conference or seminar or even in his office. When the verbal praise is done quickly, then the work environment is positive and performance standards are maintained [11].

Written Praise

Written praise can be in the form of letters of appreciation or emails expressing gratitude or commendations. Whichever the form, written praise is more substantive than verbal and has the ability to motivate staff [9]. It is there for posterity when a reminder is needed [9]. For emphasis, when the written acknowledgement is personal and details the actions while naming the staff, it is more effective [12].

Formal Recognition

This is a structured recognition framework such as 'employee of the month' and 'top performer of the year'. These are usually target-centered recognition methods aligned with organisational goals [13]. These titles are usually displayed in the physical open office spaces of companies, newspapers, social media, *et cetera*. Formal recognition also encourages workers to fortify their value within the organisation while showing that they can achieve the desired goals of the organisation [14].

Informal Recognition

This form of recognition is ad hoc, done sporadically for a particular reason and heightens motivation. A goal may be reached or a target achieved, and a supervisor or manager may recognise the employee with a spa day voucher. This type of informal recognition mainly exists in public or government offices [15, 16]. The more frequent the recognition, the more valued a worker feels and motivation is boosted [12].

Milestone Recognition

Employees may also be recognised for their dedication to an organisation for serving a number of years. For example, the Parliament of Guyana recognises employees who have served the Parliament for 10 years. This type of recognition builds employees motivation, making them more committed to the organisation [17].

Peer-to-peer Recognition

This type of recognition involves a horizontal level acknowledgement of a job well done and creates the environment for colleagues to acknowledge each other's efforts [18]. This type of recognition positively influences motivation and, as a result, improves performance because it fulfils the psychological need of humans, and that is motivation [19], which was recognised by Maslow. However, if not done correctly, this type of recognition can cause employees to feel unappreciated and devalue them [20].

Correlation among Recognition, Motivation and Performance

There is a positive relationship between recognition and motivation. Recognition enhances motivation which, in turn, according to a study by the author on the Effects of Motivation on Employee Performance, heightens performance. It satisfies the psychological need. Psychologically, the wellbeing of the employee is being sustained with acknowledgement of and appreciation for their work [21].

A study on Employee Recognition, Task Performance, and OCB: Mediated and Moderated by Pride showed that employee recognition directly positively influences employee task performance [8]. Evidently, employee recognition boosts motivation of employees by making them fulfil intrinsic needs such as a sense of purpose and belonging [22]. Not only is a sense of belonging ignited, but also commitment to the job is reinforced in

the employee [23]. Motivation positively influences motivation as well as employee engagement [2]. It is a form of appreciation that ignites a sense of value, resulting in a rise in motivation and enhance performance [22].

Another study on "The Impact of Employee Recognition Programs on Employee Engagement and Motivation: A Case Study of Southwest Airlines" confirmed that recognition programmes in workplaces positively impact staff motivation as well as enable a positive workplace culture [24].

Methodology

Population and Sampling

As referenced in the previous study by the researcher, the population of the study is 123 employees from the Parliament Office. A definition of sampling is, "the process of choosing a sample of a population from an individual or a large group for a certain type of research objective" [25]. The sample is the whole population of employees for a comprehensive study. The sampling method was purposive sampling to ensure that the census method captures all employees of every level within the Parliament Office to have an understanding from different employees. This type of sampling is appropriate for a population of 123 and their relevance to the research [25]. As a result, the findings which emanated from the study are relevant in the field of research.

Data Collection Instrument

Data collection methods and tools are "the techniques and tools used in research to collect various data which are processed quantitatively or qualitatively, then arranged systematically" [26]. The study was completed using a descriptive, analytical approach, *via* questionnaires to as the data gathering tool. The questionnaires were distributed to the employees of the Parliament Office of Guyana, and then analysed with Statistical Package for the Social Sciences (SPSS 20).

The questionnaire is an inexpensive means of acquiring data directly from the sample, provides confidentiality because of their anonymity. The researcher created the questionnaire which was distributed by the same Researcher. It compromised 15 closed ended questions which targeted demographics, effects of recognition on motivation at the Parliament Office of Guyana, and influence of motivation by recognition on performance of employees at the Parliament Office of Guyana. These questions were geared towards achieving the answers to the research questions. The respondents were given one week before the questionnaires were retrieved.

The SPSS was a quick and simple way to analyse the data. It produced graphs and tables that were easily described and explained.

The Head of the Parliament Office, the Clerk of the National Assembly, granted permission to the researcher to undertake the research.

As in the previous research by the author, for the questionnaires to possess a high standard of validity and reliability, they were tested on a small group of staff who identified ambiguities which were corrected. The amended final questionnaires were then distributed.

Results

Table 1. Recognition as a Motivator

Response	Frequency	Percentage
Yes	86	78
No	24	22

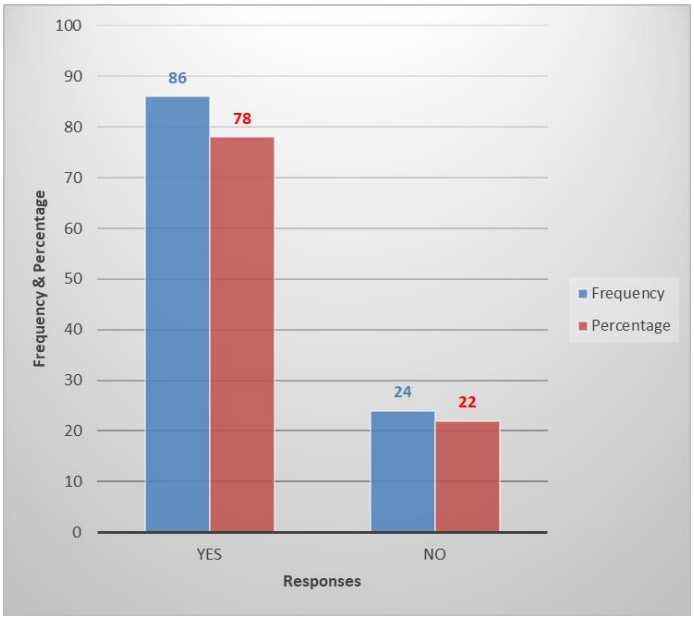

Figure 1. Recognition as a Motivator

Table 1 and Figure 1 show respondents' answers to whether recognition motivates them to perform. From the results, 78% of the employees indicated that, yes, recognition motivates them to perform in an advanced manner while 22% of them chose no. This affirms that recognition plays a significant role in motivating employees to perform better.

Table 2. Absence of Recognition leading to Demotivation

Response	**Frequency**	**Percentage**
Yes	86	78
No	24	22

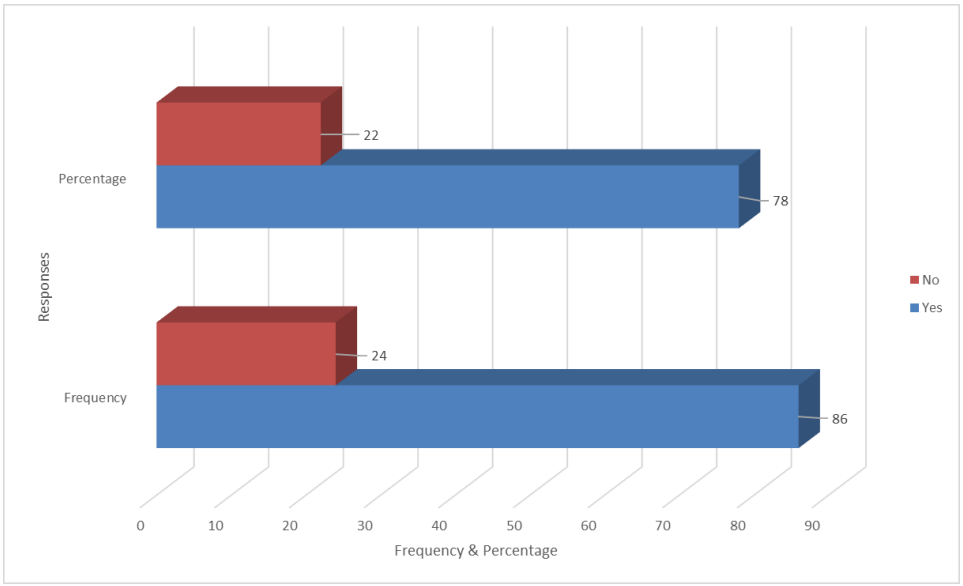

Figure 2. Absence of Recognition leading to Demotivation

Table 2 and figure 2 depict that 78% of the employees believe that lack of recognition demotivates them while 22% do not share that belief. These results are exactly the same as figure 1, emphasizing the point that recognition motivates and non-recognition does not.

Table 3. Types of Recognition preferred

Types of Recognition preferred	Frequency	Percentage
Verbal praise	77	70
Written praise	68	62
Formal recognition	60	55
Informal recognition	55	50
Milestone recognition	75	68
Peer-to-peer recognition	50	45

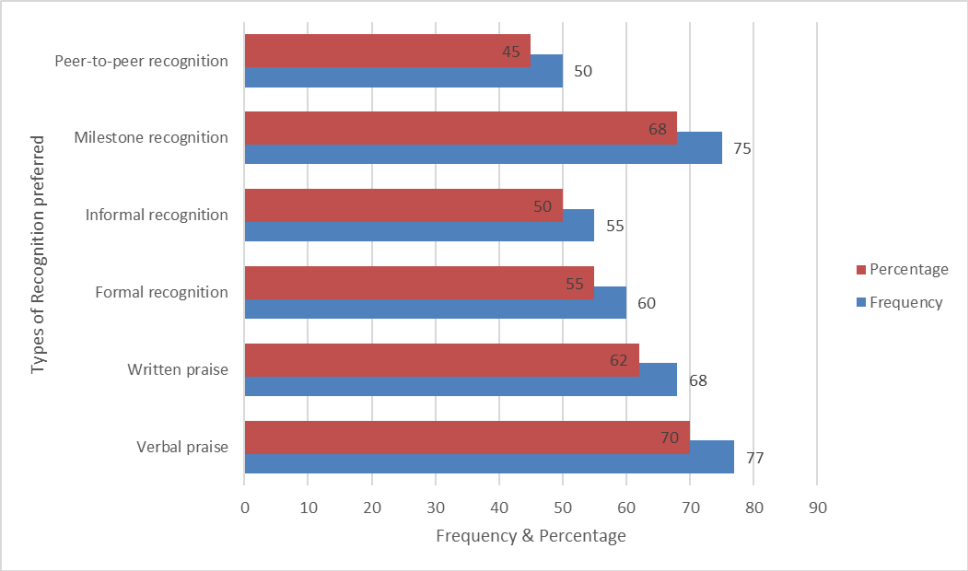

Figure 3. Types of Recognition preferred

Table 3 and Figure 3 depict the types of recognition preferred by the respondents. It is seen that verbal praise received 70%, milestone recognition received 68%, written praise received 62%, formal recognition received 55%, informal recognition received 50%, and peer-to-peer recognition received 45%. The results vividly demonstrate that verbal praise, milestone recognition and written praise are the three dominant forms of recognition preferred by the workers.

Table 4. Influence of Recognition on Motivation and Performance

Influence on Performance	Frequency	Percentage
Increased productivity	79	72
Greater initiative used	66	60
Increased loyalty to the organisation	60	55

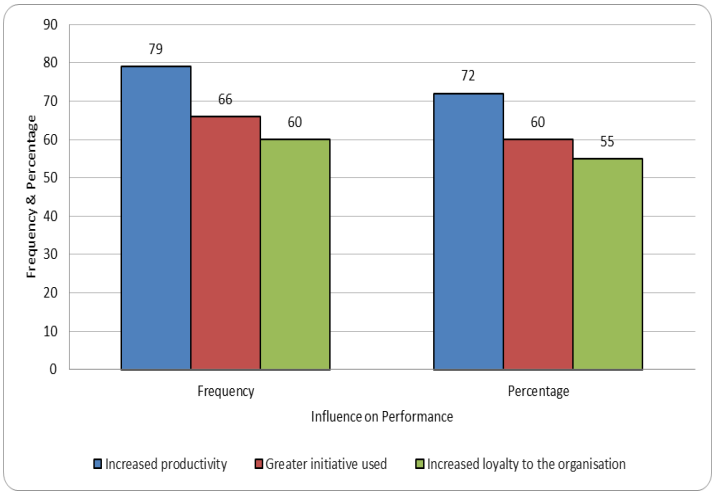

Figure 4. Influence of Recognition on Motivation and Performance

Table 4 and Figure 4 showcase that when recognition is in play, workers are motivated. Increased productivity is had in 72% of the employees, greater initiative used by 60% and there is increased loyalty to the organization of 55% of the respondents. These are all indications by the workers themselves.

Discussion

The results of the research indicate that recognition is indeed critical in influencing employee motivation within the Parliament Office of Guyana. It is glaring that the majority of respondents (78%) indicated in the affirmative that recognition motivates them to perform in a better manner (See table 1 and figure 1), and another glaring 72% indicated that recognition increases their productivity (See table 4 and figure 4). The revelations from the figures aforementioned are in keeping with Maslow's Hierarchy of Needs Theory, which posits that recognition forms part of esteem needs of workers. In Similar vein, Herzberg's Two-Factor Theory is cemented in the results of the study, showing that recognition is a motivator which enhances performance.

It is seen in the research that the workers have varying preferences for different types of recognition. Recognition in the form of verbal praise and milestone were highly preferred (see table 3 and figure 3). This gives credence to the notion that direct and personal recognition is important, in keeping with studies done (Kubo and Hori (2023). Peer-to-peer recognition was not as popular as verbal praise and milestone recognition (see table 3 and figure 3) but still made its impact on some employees. This reveals that peer-to-peer recognition, which is horizontal, is not ineffective, even though not as effective for some staff.

There can be no doubt, from the literature review as well as the results of the study, that there is a positive correlation between recognition and motivation, which leads to enhanced performance. This is in keeping with McClelland's Acquired Needs Theory, detailing that recognition helps with the fulfilment of the need for achievement.

The research highlights that non-monetary recognition within the Parliament Office can be used to make employees feel valued and motivated, and will redound to better service delivery to the Members of Parliament and, by extension, the people of Guyana.

Conclusion

This research was conducted to determine the influence of recognition on employee motivation and its effect on performance at the Parliament Office of Guyana. The findings demonstrate that recognition is a direct influencer of motivation, impacting workers engagement, commitment and dedication to accomplishing tasks in an increased efficient

manner. The research also showed that recognition which is direct and personal is more favoured by employees. Importantly, the results were in consonance with well-known theories by Maslow, Herzberg and McClelland; recognition fulfils esteem needs and is a motivator.

The findings have led to the conclusion that the Parliament Office of Guyana will benefit from a wholistic recognition programme which encapsulates verbal, written, formal and milestone recognition. This will lead to a sense of value which will transcend to a motivated staff compliment and will boost performance, redounding to the benefit of all Guyanese.

Conflict of Interest

The researcher conducted the research in an unbiased and professional manner. It is an independent study which meets the standards of integrity. There was no influence of the researcher on the respondents or the outcomes. As a result, it is safe to say that there is an absence of conflict of interest in this research.

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References

[1]. Brun, J., & Dugas, N., 2008, An analysis of employee recognition: Perspectives on human resources practices, *The International Journal of Human Resource Management, 19*(4), 716–730, Doi:10.1080/09585190801953723

[2]. Kerketta, V., & Chauhan, S., 2023, Impact of Reward and Recognition on Job Satisfaction and Motivation, *IRE Journals*, *6*(12), 1245-1253, https://www.irejournals.com/formatedpaper/1704783.pdf

[3]. Maslow, A., 1943, A theory of human motivation, *Psychological Review, 50*(4), 370–396, https://doi.org/10.1037/h0054346

[4]. Herzberg, F., Mausner, B., & Snyderman, B., 1959, The motivation to work (2nd ed.), *John Wiley.*

[5]. McClelland, D., 1961, The Achieving Society. Princeton, *NJ: Van Nostrand*, https://gwern.net/doc/economics/1971-mcclelland-theachievingsociety.pdf

[6]. Okon, M., John, N., & Imagha, O., 2023, Employee Well-Being: Recognition and Non-Academic Staff Performance in Select Federal Universities, South-South Geo-Political Zone, Nigeria, *Global Journal of Human Resource Management, 11,* 13-26. Doi: 10.37745/gjhrm.2013/vol11n11326

[7]. Robbins, S., & Judge, T., 2019, Organizational Behavior (18th ed.), *Pearson*.

[8]. Yang, T., Jiang, X., & Cheng, H., 2022, Employee Recognition, Task Performance, and OCB: Mediated and Moderated by Pride, *Sustainability*, *14*(3), 1631, https://doi.org/10.3390/su14031631

[9]. Adesina, I., & Egbuta, O., 2025, Strategic Reward and Recognition Systems: Driving Employee Engagement and Retention in Talent Management Practices, *Journal of Economics, Finance and Management Studies, 8*(5), Doi: 10.47191/jefms/v8-i5-18

[10]. Kubo, M., & Hori, M., 2023, Verbal appreciation and its effect on employee retention: Evidence from East Asia, *International Journal of Human Resource Studies*, 13(1), 88–105, https://doi.org/10.5296/ijhrs.v13i1.20835

[11]. Nguyen, T., Pham, H., & Le, D., 2023, Written and verbal recognition and psychological capital: A longitudinal analysis, *Employee Relations International*, *45*(2), 301–316. https://doi.org/10.1108/ERI-12-2022-0475

[12]. Gallup, 2023, *State of the Global Workplace: 2023 Report*. https://www.gallup.com/workplace/349484/state-of-the-global-workplace.aspx

[13]. Singh, S., Kaur, J., & Singh, D., 2022, Role of structured recognition in employee performance: Evidence from corporate practices, *Journal of Human Resource and Sustainability Development, 10*(1), 34–47, https://doi.org/10.4236/jhrss.2022.101003

[14]. Tan, Q., & Lee, H., 2023, Impact of employee of the month programs on organizational commitment: A longitudinal study, *Asia Pacific Journal of Human Resources, 61*(2), 155–173, https://doi.org/10.1111/1744-7941.12345

[15]. Ndungu, D., 2017, The Effects of Rewards and Recognition on Employee Performance in Public Educational Institutions: A Case of Kenyatta University, Kenya. *Global Journal of Management and Business Research*, *17*(A1), 43–68, https://journalofbusiness.org/index.php/GJMBR/article/view/2183

[16]. Osabiya, B., 2015, The effect of employees' motivation on organizational performance. *Journal of Public Administration and Policy Research, 7*(4), 62–75, https://academicjournals.org/journal/jpapr/article-full-text-pdf/721d2f153302

[17]. Grawitch, M., & Ballard, D., 2020, Building psychologically healthy workplaces: Recognition and the role of meaningfulness in engagement, *Journal of Occupational Health Psychology*, 25(4), 234–245. https://doi.org/10.1037/ocp0000174

[18]. Shinde, S., 2025, Peer-to-Peer Recognition Systems and Their Impact on Employee Commitment: A Case-Based Exploration of Culture, Motivation, and Retention, *Research Review Journal of Social Science, 5*(1), 58-68, Doi: 10.31305/rrjss.2025.v05.n01.007

[19]. Rusin, N., & Szandała, T., 2025, The power of peer recognition points: Does it really boost employee engagement?, *Strategic HR Review, 24*(1), 2–10, https://doi.org/10.1108/SHR-06-2024-0040

[20]. Black, P., Cecchini, M., & Newman, A., 2024, When being recognized makes employees feel less appreciated: Evidence regarding when and why peer-to-peer recognition could backfire. *Accounting, Organizations and Society, 113*, 101565, ISSN 0361-3682, https://doi.org/10.1016/j.aos.2024.101565

[21]. Ndiango, S., Gabriel, D., & Changalima, I., 2024, Give me my flowers before I die! Linking employee recognition, job satisfaction and employee retention in logistics companies: A multigroup analysis, *Social Sciences & Humanities Open*, *10*, 101053, ISSN 2590-2911, https://doi.org/10.1016/j.ssaho.2024.101053

[22]. Arunraj, R., Murugesan, P., Pandi, V., & Sivasubramanian, S., 2024, Effects of Employee Recognition Programs on Engagement and Retention, *Library Progress International, 44*(3), 764-768, https://bpasjournals.com/library-science/index.php/journal/article/view/467/275

[23]. Ajila, C., & Abiola, A., 2004, Influence of rewards on workers performance in an organization, *Journal of Social Sciences, 8*(1), 7–12, Doi:10.1080/09718923.2004.11892397

[24]. Joseph, N., 2023, The Impact of Employee Recognition Programs on Employee Engagement and Motivation: A Case Study of Southwest Airlines. 1. https://www.researchgate.net/publication/370710004_The_Impact_of_Employee_Recognition_Programs_on_Employee_Engagement_and_Motivation_A_Case_Study_of_Southwest_Airlines

[25]. Makwana, D., Engineer, P., Dabhi, A., & Chudasama, H., 2023, Sampling methods in research: A review. *International Journal of Trend in Scientific Research and Development, 7*(3), 762-768, www.ijtsrd.com

[26]. Sukmawati, Sudarmin, & Salmia, 2023, Development of quality instruments and data collection techniques. *Jurnal Pendidikan & Pengajaran Guru Sekolah Dasar, 6*(1), 119-124, http://journal.unpak.ac.id/index.php/jppguseda

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The Policy Divide: A Review of Botswana's HRH Strategy Development and Implementation in the Context of the Global Strategy on HRH2030

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Abstract

Health systems across Africa carry the significant burden of disease globally, a situation exacerbated by a critical shortage of health workforce required to meet this demand. This study assessed Botswana's Human Resource for Health HRH strategy, focusing on its development process, content, and implementation challenges within the context of the World Health Organization's Global Strategy on Human Resource for Health: Workforce 2030. A qualitative research design was used, involving document analysis through the policy triangle framework and key-informants' interviews. Thematic and content analysis were employed to interpret data from HRH strategic documents and 38 interviews with key stakeholders. The findings reveal that Botswana's HRH strategies are largely aligned with the global strategy particularly objective 1 & 2, emphasizing workforce performance and investment alignment. However, the strategy development process, though inclusive on paper, often lacks effective stakeholder engagement and is constrained by limited financial and human resources. These challenges contribute to weak implementation and poor sustainability of HRH initiatives. The study concludes while Botswana has made commendable progress in aligning its HRH efforts with global goals, addressing the systematic barriers, particularly stakeholder representation and resourcing, is critical to achieving long term improvements in health work force planning and implementation.

Keywords: *Human Resource for Health, Policy Implementation, Stakeholder Engagement, Workforce Planning and Development.*

Introduction

Health systems in sub-Saharan Africa continue to face an overwhelming share of global disease burden, a situation largely exacerbated by a persistent shortage of Human Resource for Health (HRH). [1] Strengthening the health workforce is therefore a key priority for achieving global initiatives such as universal health coverage (UHC) and the Sustainable Development Goals (SDGs) [2]. To address these challenges, the World Health Organization (WHO) introduced the Global Strategy on Human Resource for Health: Workforce 2030, which outlines four strategic objectives aimed at improving workforce performance, aligning investments with needs, addressing geographical and skill distribution imbalances, enhancing policy stewardship [3]. Like many other nations in the region, Botswana has made significant strides in developing national HRH strategies that aim to address workforce gaps and aligning with global standards [4]. However, the effectiveness of such strategies depends not only on their technical content, but also on the process through which they are developed and implemented [4].

This study investigates Botswana's Human Resource for Health strategy development through the lens of the WHO Global strategy on

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Human Resource for Health: Workforce 2030, focusing on the development process, content and implementation bottlenecks. Using a qualitative approach, this study assesses the extent to which Botswana's HRH for Health policy align with the WHO Global strategy on HRH: Workforce 2030 and examines the structural and operational factors influencing their implementation. Existing literature has documented several common issues that affect effective HRH strategy rollout, such as poor stakeholder engagement, limited infrastructure, inadequate monitoring mechanisms and a lack of coordinated implementation [6, 7]. Studies have also found that weak alignment between national strategies and the global framework often results in fragmented execution and poor accountability [8, 9]. By framing this investigation, with the WHO strategic framework, the study contributes to growing scholarship on HRH governance in low- and middle-income countries (LMICs) and offer evidence for more responsive and adaptive HRH planning practices.

Despite Botswana's stable governance and long standing healthcare improvements, the country continues to face persistent challenges in public health policy development and implementation, particularly in the area of HRH [5-7]. Although National Strategies exists, their tangible outcomes remain weak due to the combination of institutional, structural and financial limitations [9]. These includes, inadequate funding, limited engagement for frontline actors, weak inter-agency coordination and evaluation practices [10, 11]. Comparatively, other African nations such as Zambia, Ghana and Namibia face similar challenges in transforming policy practice. Namibia, for instance continues to face funding shortfalls and skills shortages that compromise HRH strategy implementation [13]. Zambia has received criticism for limited stakeholder engagement in policy making development process, resulting in lack of buy-in and weak policy implementation [12]. Ghana has dealt with fragmented institutional responsibilities and inconsistent policy monitoring [6].

These challenges are often rooted in a disconnect between policy designers and implementers, emphasizing the need for context-specific, inclusive, and resource-sensitive approaches to HRH policy formulation and execution. Understanding Botswana's experience offers valuable insights that can inform improved governance and strategy in similar LMICs settings.

Methodology

Study Design

A cross-sectional qualitative study was conducted within Botswana's Ministry of Health. This design was selected to capture participants' current experiences and perceptions at a specific point in time, without the need for longitudinal follow up. Data collection involved conducting key informant interviews with stakeholders drawn from a range of relevant sectors, providing rich and contextual insights into the research objectives.

Study Setting

The study was conducted in Botswana, with informants recruited from both national and sub-national levels of the country's health system, to capture diverse perspective on human resource issues across different tiers of governance. Additionally, the study setting allowed exploration of how national policy translate into operational realities at service delivery points, particularly in resource constrained environments.

Study Population and Sampling

The study population comprised of a diverse group of policy makers and stakeholders occupying various levels of responsibility within the Ministry of Health and its key partner organisations. A total of 38 individuals participated, including Ministry of Health (MoH) policy makers, program managers, senior executives, focal persons, development

partners, private sector stakeholders and representatives from other relevant government ministries. Purposively, sampling was employed to select key informants based on their direct involvement in Human Resource for Health (HRH) planning, management, training and support. Eligibility criteria included employees of the MoH or affiliated stake holders serving in roles such as Unit Heads, Program Managers, Senior Executive Managers, supporting agencies providing HRH-related services, including private institutions providing health programs.

The lead researcher, assisted by trained research assistants, coordinated the scheduling and execution of interviews. Research assistants were trained in qualitative interviewing techniques and briefed on the study's objectives, ethical protocols, and procedures for obtaining informed consent. Prior to each interview, participants were fully informed about the study, assured confidentiality, and asked to sign a consent form before any data collection began. Interviews were audio recorded with participant permission to ensure accurate data capture and facilitate detailed analysis.

Data Collection

Data were collected through face-to-face, in-depth interviews, each lasting approximately 40 and 60 minutes. To ensure privacy and encourage open dialogue, interviews were conducted at the informants' workplace or offices. With prior consent, all interviews were audio recorded to maintain and allowed for detailed analysis. The face-to-face interview approach facilitated a deeper understanding of participants' perspectives by enabling interactive dialogue, clarifying responses and probing rich, contextual information. An open-ended interview guide, aligned with the study objectives, was used to maintain consistency while allowing flexibility to explore emerging themes. This approach ensured that participants could freely express their experiences, perceptions, and insights related to the development content and implementation of human resource for health strategies. Prior to each interview, participants were informed about the study's objectives, procedures, and written informed consent was obtained.

Data Analysis

Each audio-recorded interview was transcribed verbatim by the lead researcher, with assistance from two trained research assistants. Transcripts were meticulously reviewed to correct any transcription errors and ensure accuracy. Data were then analysed using thematic analysis, following a structured process that began with an initial thorough reading of the transcripts to identify emerging ideas and patterns. an open approach coding was employed, where meaningful units of text were labelled and grouped into preliminary categories. These codes were systematically reviewed, refined, and reorganised into broader themes that reflected recurring patterns across the dataset. To enhance the rigor and reliability of the analysis, ATLAS.ti. Version 9 software was utilized to manage the coding process, facilitate systematic retrieval of data segments, and ensure comprehensive identification of all relevant categories based on the developed coding framework. Throughout the analysis, the lead researcher, engaged in regular consultations with the co-authors who also served as study supervisors. These interactive consultations, helped to validate interpretations, refine thematic structures, and ensure that findings remained grounded in the participants' narratives.

Ethical Considerations

Ethical approval for this study was obtained from the Texila American University Institutional Review Board and the Ministry of Health Research Ethics Committee in Botswana. Additionally, a formal research permit was obtained before commencing the study. All participants were provided with

detailed information about the study's purpose, procedures, and their rights as participants. Written informed consent was obtained from each key informant prior to data collection. Participation was entirely voluntary, and participants were assured of confidentiality, with the right to withdraw from the study at any point without penalty.

Findings

Table 1. Study Participants' Demographics

Variables	Frequency f	Percentage %
Organization type		
MOHW	32	84
Regulatory Body (Health Professionals)	2	5
Academic institutions	3	8
HRDC	1	3
Partners	1	3
Type of Organization		
Government	33	87
Private	1	3
Parastatal	3	7
Multilateral	1	3
Gender		
Males	17	45
Females	21	55
Age groups		
18 – 25	0	0
26 – 35	5	13
36 – 45	13	34
46 – 55	13	34
56 +	7	19
Education Level		
Degree	11	29
Masters	26	68
PhD	1	3
Experience		
11 – 15	1	3
16 – 20	15	39
21 and above	22	58
Total	38	100

A total of 38 key informants took part in this study, majority of whom (84%) were drawn from the MOH, while a small portion represented the Human Resource Development

Council (3%) and various other organizations (13%), including development partners and private health sector institutions. More than half of the participants (55%) were females, and most held advanced academic qualification, with 68% possessing a master's degree or higher. Additionally, a substantial segment of the sample (58%) reported over 20 years of professional experience in health policy, planning, or human resource management. This diverse yet highly qualified cohort provides a robust foundation for understanding the process, content, and implementation challenges of Botswana's HRH strategy in alignment with the WHO's Global strategy on human resources for health: Workforce 2030.

Document Review Findings

Table 2. Document analysis in relation to HRH planning and development in Botswana in alignment to WHO Global strategy on HRH: Workforce 2030

National document (doc title and period of cover)	**Content (what are the goals, strategies, and interventions proposed to address the policy issue)**	**Context (circumstances surrounding the development of the policy)**	**Process (how was the policy developed – key steps, decisions and related actions)**	**Actors (who were the key players including their role)**	**Comment (alignment to WHO HRH2030)**	**Implications for Botswana**
National Health Policy (2011 – 2021)	Ensuring an appropriately skilled, motivated, well-distributed, and productive workforce for the provision of quality health services • Health workforce development • Recruitment and retention strategies • Development and implementation of performance standards and norms for service delivery	• Vision 2016 • MDG • SDH • Demographic transition • Health status • Service delivery	• Situational analysis • Stakeholder Reference Group • Thematic Groups • Consensus building through national stakeholder and regional consultation meetings.	• Ministry of Health • National and regional stakeholders group sessions	The National Health Policy content is aligned with the WHO HRH2030 objective #1 – "optimize performance quality and impact of the health workforce through evidence-informed policies on HRH contributing to healthy lives and well-being, effective UHC, resilience and strengthened health systems at all levels.	The policy supports strategic workforce planning with a focus on the distribution of health workforce as a critical pathway towards achieving UHC and delivering quality healthcare service. To ensure long term impact, Botswana must strengthen its monitoring & evaluation systems of the policy supports strategic workforce planning prioritizing fair

						distribution of health workforce as a means to achieving UHC and quality healthcare. Botswana should strengthen its monitoring & evaluation systems to track progress and inform continuous improvement
Integrated Health Service Plan (IHSP) (2010-2020)	Ensuring an appropriately skilled, motivated, well-distributed, and productive workforce providing quality health services effectively and efficiently • Ensuring staff have the necessary skills • Human resource performance and motivation • Establishing a coordinated approach to human resource planning • Addressing the shortage of heal professionals • Improving the distribution of health professionals • Co-ordination of human resource planning for the health sector	• Vision 2016 • Mission • Values • MDGs • SDG • Service Delivery • Socio economic • Health Status	• Situational analysis • Development Partners • Consensus building through national and regional consultation meetings	• Ministry of Health -National Regional stakeholders • Health Districts • Group sessions	The IHSP content is aligned with WHO HRH 2030 objective #2 “Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum	Emphasizes the importance of data driven HRH policies. To sustain investment and improve coordination in HRH of Botswana should enhance intersectoral collaboration

					improvements in health outcomes, social welfare, employment creation and economic growth.	
Retention strategy For Health Workers 2011	• Ensuring that all health facilities are staffed by appropriate numbers of committed, competent professionals to achieve the goal of improved health status. • Implementation of the human resource strategy • Introduction of a robust system of Human Resource planning • Introduction of fair and transparent deployment and promotion practices • Strengthen Opportunities for Professional Development and Career Advancement • Improve Availability and Quality of Health Worker Housing • Develop an Attractive Incentives package • Develop a Rural Incentives Package	• MDGs • Service delivery • Acute Shortage of healthcare professionals	• Baseline assessment • Document review • Focus groups • Workshops • Key informant interviews	• Ministry of Health National & Regional stakeholders	The Retention Strategy for Health Workers content is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and	Highlights critical retention challenges both in rural & urban areas. The development & implementation of competitive incentive packages & improved working conditions are essential for Botswana to retain its health workforce, meet the current and future needs of the population, and enhance the health outcomes.

	• Review salaries and benefits using the WHO Job Classification Scheme • Develop distinct career paths for health professionals • Train all managers in management and leadership skills				economic growth.	
Botswana Human Resource's Strategic Plan (2007-2016)	• Ensure equitable distribution of HR • Ensure access to services through the availability of human resources • Phased affordability of human resources up to 2016 • Guidelines on implementation of HR including recruitment & training strategies	• Vision • Mission • Vision 2016 • National Development Plan Nine (NDP9) • Integrated Service Delivery Framework within the context of Botswana	• National perspective through collection of relevant health sector data though: • HR Development Team • HRH management meetings • Group discussion forums • Document reviews • Stakeholder consultation • Key Informants Interviews • District workshops	• Ministry of Health • Reference groups • Technical working groups • Development partners • Non-Governmental Organizations • Relevant Government Ministries	The Botswana Human Resource's Strategic Plan content is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements	Demonstrates a commitment to long term planning. There is a need for an updated or reviewed HRH strategic plan that incorporates current and future labor market dynamics to ensure relevance and sustainability.

					in health outcomes, social welfare, employment creation and economic growth.	
National document (doc title and period of cover)	**Content (what are the goals, strategies, and interventions proposed to address the policy issue)**	**Context (circumstances surrounding the development of the Policy)**	**Process (how was the policy developed – key steps, decisions and related actions)**	**Actors (who were the key players including their role)**	**Comment (alignment to WHO HRH2030)**	
Ministry of Health Training Plan (2024-2025)	• Ensuring an adequate, motivated and skilled health workforce in the right places at the right time • Access basic skills for health workers and provide support where applicable • Ensure staff have the right skills to deliver required services • Intake of students to training institutions aligned with projected HR needs • Ensure continuous professional development • Ensure that the workforce is aware of & prepared to meet country 's present & future needs. Minimize staff turnover	• Vision • Mission • Values • IHSP • General Order & DPSM Training Management Hand book 1999 • Disruption of services • Have properly trained & competent workforce	Process not indicated-	Ministry of Health	Ministry of Health Training Plan content aligns with WHO HRH 2030 2030 objective #2 "align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health	Provides a future focused perspective. Continuous professional development should be institutionalized with training programs informed by data and aligned with current and emerging health demands. Strengthening collaboration between education and health sectors is essential for minimizing skills mismatches and enhancing workforce retention in Botswana.

					outcomes, social welfare, employment creation and economic growth.	
Essential Health Services Package (EHSP) (2010-2020)	Attainment of universal coverage of high-quality package of essential health services. • Staffing standards are based on staff-mix by levels of service delivery • Develop strategies for the production of optimum human resources. • Standards norms assist to plan for deployment and recruitment of staff.	National Health Policy 2010 IHSP	• Situational analysis • National & regional Stakeholder consultation	• Ministry of Health • Stakeholders • Thematic groups • Other Government • Ministries • NGO's • Development Partners	Essential Health Service Package content is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth.	Underscores the link between service delivery packages and HRH requirements. Given the current disease burdens and evolving health demands, Botswana should revise its staffing guidelines to better align with service delivery planning with HRH strategies, ensuring quality care across all levels of the health system.

MOH Transfer Guidelines 2012	Ensure effective & efficient utilization of human resources. • Review of transfer guidelines • Outline procedure to be followed when transferring officers with a view to ensure that transfers, redeployments and postings are done in a transparent manner • Take into consideration employees' welfare when transferring them without necessarily compromising service delivery. • Guard against keeping employee in one duty station more especially in remote areas for longer periods except where it is an employee's choice. • Assures all employees fair treatment.	• Public Service Act, Director of Public Service Management Directives • Government rules and regulations governing transfers.	Not indicated	Ministry of Health	The Ministry of Health Transfer guidelines content is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth.	Addresses inequity in staff transfers particularly in rural areas. Developing & implementing fair, transparent and equitable transfer policies is crucial to enhance employee morale and ensure balanced staffing levels across all levels of the health system.
HRDC Health Sector Human Resource Development plan 2016	Map out a strategy for the development of a skilled workforce in the health sector	• Vision 2016 • Vision 2036 • NDP 11 • National Health Policy 2011	Key informant interviews Consultations of key stakeholders including Professional	• Ministry of Health • Key informant interviews • Health Sector Committee's	The Human Resource Development Council Plan HR Development	Promotes a cross-sectoral comprehensive approach that emphasizes curricular

	• Reducing the shortage of health professionals, • Improving the distribution of health professionals • Ensuring staff have the necessary skills to deliver the required services, • Improving performance and motivation of human resources • Coordination of human resource planning across the health sector. • Improve curriculum relevance to the needs of the health labor market • Develop Work Plan for Health Professionals (Work – Place Learning) • Develop career guidance • Improve Staff Retention • Improve Service Delivery in Remote Areas • Improve Management of Recruitment (Effectiveness & Timeliness • Create an Enabling Work Environment for all Health Workers	• Government's policies and strategies in the Health sector • Ministry of Education and Skills Development's (MoESD) Strategic Plan,	bodies and Botswana Nurses Union	• Key Stakeholders e.g. MoH, DPSM, MoESD, BQA, HRDC, Profession al Bodies, Training Institutions, Statistics Botswana, Private Sector	Plan content isDevelopment Council is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth.	relevance and workplace learning to reduce skills mismatches and effectively respond to the evolving demands of the health sector. HRDC needs to strengthen labour market intelligence systems to anticipate current and future health workforce needs and establish regular inter-ministerial forums and data platforms for health workforce planning.

Botswana e-Health Strategy 2020-2024	• Develop & implement a comprehensive eHealth human resource strategy to address manpower shortages at central, District, hospital & facility levels. • Develop a human capital plan for those leading & managing the eHealth Strategy • Conduct skills assessment for eHealth management workforce • Develop skills retention policy for eHealth professional staff	• Vision • Mission • Values • Vision 2036 • NDP 11 • SDGs • UHC • National Health Policy 2011 • Government Strategy. • Maitamo Policy • M& E Plan • National eHealth Strategic goals	• Situational analysis • Key informant interviews • Stakeholder consultations • Technical Teams	Ministry of Health -National &Regional Stakeholder contributions -Development Partners -Technical Teams • -WHO Country Office & -WHO AFRO Regional Office.	The Botswana e-Health Strategy content is aligned with WHO HRH 2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth.	Highlights the critical need for digital transformation in HRH management. To sustain health sector digitization. Botswana should invest in robust digital infrastructure and enhance its ICT workforce capacity. This will enable the Ministry to make data-informed decisions and develop responsive polices.
Human Resource Management Guidelines 2012	Ensure the best fit between employees and jobs while avoiding manpower shortages or surpluses. • attracting and retaining	• Vision • Mission • Values • Relevant policies and Legislation	Not indicated	Ministry of Health	The Human Resource's Management Guidelines content is aligned with WHO HRH	Promotes evidence driven workforce planning. To enable proactive and strategic HRH

	competent human resources. • forecasting labor demand • analyzing present labor supply, • balancing projected labor demand and supply. • ensure that its recruitment and selection procedures are fair				2030 objective #2 "Align investment in human resources for health with the current and future needs of the population and of health systems, taking account of labor market dynamics and education policies; to address shortages and improve distribution of health workers, so as to enable maximum improvements in health outcomes, social welfare, employment creation and economic growth.	planning, Botswana, should establish comprehensive real-time HRH information system that supports data driven decision-making and policy development.

Document Review Analysis

The analysis of the ten strategic documents (as summarized in Table 2) reveal that Botswana's health workforce instruments are largely aligned with WHO Global Strategy HRH: Workforce 2030, with a particular strong emphasis on objective #1 and #2. The development of strategies has leveraged established stakeholders' engagement mechanisms – such as technical working groups and reference groups, as part of the consultation process. However, despite these efforts, implementation remains inconsistent. This inconsistency is evidenced by lack of monitoring and evaluation reports, as well as the absence of a comprehensive HRH information system, compounded further by fragmented HRH management structures. As a result, the meaningful participation and sustained contribution of key stakeholders are hindered. Furthermore, the review highlighted that several policy documents are now obsolete

and urgently require revision to reflect the evolving health sector needs and contextual reality.

Poor Implementation of the Strategy

A central theme that emerged from the data regarding challenges in implementing the HRH strategy was the lack of understanding and awareness among the key stakeholders. This gap is clearly reflected from respondents' statements such as;

"*One of the biggest problems is that people really don't understand the aspect of policy cycle. So that they end up not doing certain things. leadership is not clear on leadership restructuring*". **Key informant 2**

Additionally, key informants identified several factors contributing to the poor implementation of the strategy. A critical issue raised was the shortage of skilled personnel, further exacerbated by the immigration of health workers seeking better opportunities locally and internationally. Another recurring issue was inconsistency in the execution of the HRH strategy. When asked about the existence of the strategy, a significant number of key informants reported being unaware of it, as highlighted by the following response

"I have never seen it" **Key informant 7***"I don't know"* **Key informant 6**

"I don't know" **Key informant 6**

Nonetheless, a few key informants acknowledged the existence of the HRH strategy but emphasized that it is outdated and no longer aligned with the current health sector needs. For example:

"The strategy is available but obsolete" **Key informant 5**

These findings suggest that a notable proportion of officers, including senior staff within the ministry of Health, are either unaware of or disconnected from the HRH strategy. This lack of awareness and engagement indicated that the strategy was not adequately disseminated and has not been effectively implemented across all operational levels.

Discussion

Botswana 's health system operates within a socio-economic and epidemiological context characterized by a high burden of disease and communicable and non-communicable diseases, persistent workforce shortages, and fiscal constraints [1]. These contextual factors have significantly influenced the development of the country's HRH policies, which aim to align with broader national development goals such as Botswana Vision 2036. Regional commitments and the WHO Global strategy on HRH: Workforce 2030 have also provided important guiding frameworks for these policies. However, the successful implementation of HRH strategies remains constrained by structural limitations, including limited financing, inadequate workforce planning capacity and a reliance on donor – funded programs [2].

Although Botswana is recognized for developing well-crafted policies, research findings from previous studies reveal persistent difficulties in translating these strategies into effective action. Key barriers include a lack of role clarity across different management levels and insufficient training for managers tasked with executing the policies. Moreover, the absence of detailed operational plans has resulted in ambiguous implementation processes and weak accountability mechanisms. Consequently, critical goals such as achieving equitable health workforce distribution and integrated workforce planning remain largely unattained, particularly across different levels of the health system [14].

Lack of Resources

Another major bottleneck identified through the interviews was the persistent lack of resources necessary for the effective implementation of the HRH strategy. Several key informants emphasized that financial

constraints, staffing shortages and fragmented health information system hinder the full realization of strategic goals. This was expressed by participant 10, who stated:

Participant 10.

"There is lack of funds, shortage of staff and fragmented health information from facilities".

In addition to resource limitations, the lack of commitment from the leadership was highlighted as a critical challenge. **Key informant 2** elaborated:

On the same vein, Key informants indicated the lack of commitment by leadership by stating that.

"One of the biggest problems is that people really don't understand the aspect of policy cycle. So that they end up not executing what is supposed to be done. Leadership is not clear on leadership restructuring".

These insights suggest that beyond financial and infrastructural deficiencies, weak leadership commitment undermines efforts to mobilize and allocate necessary resources effectively. Leadership gaps in understanding strategic processes further exacerbates delays and inefficiencies in the implementation of the HRH strategy, threatening the overall progress of workforce planning and development initiatives. Further compounding these challenges is the issue of inadequate resourcing, where limited financial allocation, insufficient human resource capital, and fragmented funding streams significantly undermine policy execution. [1, 3] In Botswana, gaps in budgetary support and institutional capacity, particularly at decentralized levels have hindered the translation of HRH strategic objectives into outcomes. Similar patterns are evident across countries like Namibia, Malawi and Lesotho, reinforcing the need for robust, context-sensitive resourcing strategies embedded with HRH policies [1, 13]. Sustained domestic investment, political commitment, and strengthened governance structures emerge as critical enablers of policy sustainability and responsiveness in resource-constrained settings [1].

Limited Representation of Stakeholders

An overarching theme that emerged from key informants' responses was the limited awareness or lack of familiarity with the Ministry's Human Resources for Health strategy. This gap in awareness was evident as a significant number of the informants admitted to being unfamiliar with the strategy. For instance, key informant 2 stated:

"*I am not familiar with the HRH strategy"*

Similarly, **Participant 6** responded:

"*I am not sure"*

Participant 14 also confirmed their unfamiliarity by stating:

"I don't know".

While **Participant 17 and 19** responded with a "*No.*"

These responses collectively suggest that the HRH strategy was not effectively communicated or disseminated across various managerial and operational levels within the Ministry of Health. The limited stakeholder engagement and lack of cascading information likely contributed to weak ownership, poor alignment of departmental activities with strategic goals, and ultimately, the poor implementation of the HRH strategy. In addition to financing issues, limited stakeholder engagement surfaced as a major bottleneck.

Botswana HRH strategy development process leverages institutional mechanisms such as technical working groups and reference groups to coordinate stakeholder input [3], however, findings reveal that engagement is often an ad hoc, restricted to selected actors, and poorly integrated into implementation stages. The lack of systematic feedback mechanism and robust monitoring frameworks further undermines accountability and continuous learning. This is consistent with experiences in Namibia and Eswatini, where centralized decision-making and poor coordination with frontline actors has

constrained the success of HRH interventions [15].

Finally, despite some alignment with WHO Global Strategy HRH: Workforce 2030 objectives, Botswana HRH strategy documents give limited attention to Objectives #3 and #4, which address governance and investment in education and lifelong learning. Priorities such as workforce retention, rural deployment, and task-shifting are emphasized; however operational detail, measurable indicators, and clear resource mobilization strategies are often missing, further challenging effective implementation. Overall, the findings of this study highlight that while Botswana has made commendable efforts in developing HRH strategies aligned with international frameworks, gaps in resourcing, stakeholder engagement, operational planning, and governance continue to undermine effective implementation. These challenges mirror broader systematic issues faced by other low-middle-income countries, emphasizing the need for comprehensive, inclusive, adequately resourced policy approaches.

Addressing this short coming will be pivotal to strengthening Botswana's health workforce and achieving both national developmental goals and global health targets. In light of these findings, the following conclusion and recommendations are proposed to guide future policy development and implementation. Despite the valuable insights, this study faced several limitations. A major limitation of the study was the restricted geographical scope, as data collection was conducted in Gaborone. This may limit the generalizability of the findings to another district in Botswana. Additionally, the study population consisted primarily of senior executives within the Ministry of Health whose limited availability necessitated rescheduling interviews, potentially affecting the depth of data collection.

Conclusion

Botswana has made commendable strides in developing and implementing national policies and strategic plans to address HRH challenges. The reviewed documents reflect a strong commitment to aligning national HRH initiatives with the WHO Global Strategy on Human Resources for Health: Workforce 2030, particularly its objective #1 and #2, which emphasizes optimizing the performance, quality and impact of the health workforce, as well aligning investments with current and future population and health system needs. However, limited attention is given to Objectives #3 and #4, which focus on strengthening governance and investment in education and lifelong learning. Although priorities such as workforce retention, rural deployment, and task-shifting are emphasized, the strategic documents often lack operational detail, measurable indicators, and concrete resource mobilization strategies.

The HRH policy environment in Botswana reflects a strong commitment to aligning with national HRH initiatives, regional and global frameworks, including the WHO Global strategy on HRH: Workforce 2030. Strategic documents such as the HRH Strategic Plan 2020-2030 demonstrate notable progress, particularly in addressing workforce distribution performance optimization, and evidence-informed planning (Objective #1 and #2). However, critical implementation gaps remain, notably focus on governance, continuous professional development, and sustainable financing (Objective #3 and # 4). It is noteworthy that several policies are now obsolete and require revision to align with evolving health sector context.

To build a more balanced and resilient health workforce, Botswana must prioritize the operationalization of Objectives #3 and #4, emphasizing strengthened governance structures and investing in lifelong learning initiatives. Structural and systematic barriers such as limited domestic financing, constrained

planning capacity, and over reliance on donor support continue to hinder operational effectiveness. While institutional mechanisms for policy development, such as technical working groups, and reference groups are place in place, the inclusion of district managers, private sector stakeholders and academic institutions, in the implementation phase must be enhanced to ensure alignment between workforce supply and health system needs.

Ultimately, Botswana's experience mirrors a common scenario across LMICs: the development of technically sound strategic plans that fall short during execution due to systemic and operational bottlenecks. Moving forward, deliberate, coordinated, and well-resourced efforts will be essential to bridge the gap between strategy and implementation ensuring that the country builds sustainable and resilient health workforce capable of meeting future health system demands. Based on the study findings, the following recommendations are proposed to enhance the effective implementation and sustainability of HRH strategies in Botswana.

Recommendations

To strengthen the operationalization of strategic plans, Botswana should prioritize translating strategic objectives into clear and actionable implementation frameworks with defined timelines, measurable indicators, and dedicated budgets. Regular reviews should also be instituted to ensure adaptability to evolving health system needs. Furthermore, to enhance the effectiveness and sustainability of HRH policy implementation, Botswana must strengthen governance and accountability mechanisms must be strengthened by establishing clearly defined roles and responsibilities a across all levels of governance supported by a comprehensive national HRH governance framework. Robust monitoring and evaluation systems should be incorporated to promote transparency, informed decision-making and continuous improvement.

Strengthening stakeholder engagement and coordination across all levels of the health system is equally critical. This entails inclusive participation of key stakeholders including frontline health workers, training institutions, including civil society organizations and the private sector stakeholders, not only during policy formulation but also throughout the implementation phases. Establishing formalized and structured feedback mechanisms between national and district levels would promote adaptive learning, foster accountability and ensure that policies remain responsive to changing priorities and contextual realities.

Additionally, Botswana should invest substantially in education and lifelong learning by strengthening partnerships with academic and training institutions to better align preserve-service education with current and future service delivery needs. Institutionalizing continuous professional development (CPD) programs supported by incentives to promote career – long learning and maintain workforce competence is critical. Establishing a national framework for Health workforce education and CPD that integrates academic partnerships, aligns with system priorities will help build sustainable capacity.

Finally, Botswana must enhance resource mobilization and financial sustainability by increasing domestic budget for HRH to reduce dependency on external funding and improve national ownership. Exploring innovative financing mechanisms such as public-private partnerships and performance-based funding models, as well as improving resource utilization efficiency within the health sector, will be essential to ensure the long-term viability of human resources for health initiatives.

Conflict of Interest

The author declares no conflict of interest.

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References

[1]. World Health Organization. 2016. Global strategy on human resources for health: Workforce 2030. https://www.who.int/publications/i/item/9789241511131

[2]. Afriyie, D. O., Nyoni, J., & Ahmat, A., 2020. The state of strategic health workforce investments in Africa: Evidence from the WHO African Region. *BMJ Global Health, 5*(3), e002090. https://doi.org/10.1136/bmjgh-2019-002090

[3]. Republic of Botswana. 2020. Human Resources for Health Strategic Plan 2020–2030. *Ministry of Health and Wellness*.

[4]. Walt, G., Shiffman, J., Schneider, H., Murray, S. F., Brugha, R., & Gilson, L., 2008. 'Doing' health policy analysis: Methodological and conceptual reflections and challenges. *Health Policy and Planning, 23*(5), 308–317. https://doi.org/10.1093/heapol/czn024

[5]. Seitio-Kgokgwe, O. S., Gauld, R., Hill, P. C., & Barnett, P., 2016. Analysing the stewardship function in Botswana's health system: Reflecting on the past, looking to the future. *International Journal of Health Policy and Management, 5*(12), 705–713. https://doi.org/10.15171/ijhpm.2016.67

[6]. National Development Planning Commission (NDPC). 2024. National monitoring and evaluation policy. *Accra, Ghana: Government of Ghana*. Retrieved from https://www.ndpc.gov.gh/media/National_ME_Policy_Ghana.pdf

[7]. Kaboyakgosi, G., & Marata, K. P., 2013. An analysis of Botswana's implementation challenges. *Pula: Botswana Journal of African Studies, 27*(2). https://journals.ub.bw/index.php/pula/article/view/529

[8]. Sisa, E., Naidoo, G., van der Westhuizen, E. J., & Hope, K. R., 2022. Reflections on performance management system of Botswana public service, 1999–2014: An analytical review. *Journal of Public Administration and Development Alternatives, 7*(3). https://journals.co.za/doi/full/10.55190/TUMZ5318

[9]. Wotela, K., & Metla, N. N., 2021. Challenges of government policy implementation, monitoring and evaluation: Conceptualising research for Botswana Ministry of Youth Empowerment, Sport and Culture Development. *Journal of Public Administration and Development Alternatives*, 6(2). https://journals.co.za/doi/full/10.55190/QNOH8494

[10]. Phirinyane, M. B., 2009. Human resource management and decentralization in Botswana and South Africa (Doctoral dissertation, University of Birmingham). https://localdemocracy.net/2009/01/01/human-resource-management-and-decentralization-in-botswana-and-south-africa/

[11]. Metla, M., & Wotela, K., 2021. Redesigning a Ministry of Health's organizational structure: Exploring implementation challenges through Botswana's experiences. *International Journal of Health Planning and Management, 36*(2), 191–207. https://doi.org/10.1002/hpm.2275

[12]. Zambia Ministry of Health. 2017. Challenges of implementing the integrated disease surveillance and response (IDSR) strategy. Lusaka, Zambia: *Ministry of Health.*

[13]. USAID. 2015. Human Resources for Health Effort Index 2015: Namibia, Malawi, and Lesotho. Washington, *DC: United States Agency for International Development*.

[14]. Bourgeault, I. L., Simkin, S., & Chamberland-Rowe, C., 2019. Poor health workforce planning is costly, risky and inequitable. *Canadian Medical Association Journal, 191*(42), E1147–E1148. https://doi.org/10.1503/cmaj.191241

[15]. Ministry of Health and Social Welfare (MoHSW), Eswatini. 2019. Human Resources for Health Strategic Plan

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Redefining Entrepreneurial Leadership: Guyanese Women Navigating Structural Bias, Cultural Expectations, and Intersectional Barriers Through Inclusive Innovation and Community Enterprise

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Abstract

This study explores how Guyanese women entrepreneurs redefine entrepreneurial leadership by navigating multifaceted challenges rooted in structural bias, cultural expectations, and intersectional barriers. Against a backdrop of significant government investment exceeding $156 billion in women's empowerment initiatives, this research illuminates the lived realities and leadership strategies of women leading community enterprises and engaging in inclusive innovation across Guyana. Despite robust economic growth and an increasing share of women-owned ventures particularly in agribusiness where women now lead 65% of new ventures these entrepreneurs confront persistent gendered social norms, limited access to finance, and entrenched workplace inequalities. Using a qualitative methodology combining in-depth interviews, focus groups, and case studies, this study documents how Guyanese women leverage inclusive innovation practices and community-oriented business models as mechanisms to overcome systemic obstacles and cultivate sustainable enterprises. Findings reveal how leadership is redefined not only through business acumen but also through relational, culturally grounded approaches that prioritize social cohesion and collective advancement. By centering the perspectives of women navigating intersectional marginalization, this research contributes novel insights to entrepreneurial leadership theory and practice that emphasize inclusivity and community impact. The study offers policy and managerial implications aimed at fostering equitable support systems and amplifying the transformative potential of women-led enterprises in developing economies. This investigation enriches the discourse on gender, intersectionality, and innovation in entrepreneurship and provides a compelling case for reimagining leadership in contexts of social complexity.

Keywords: *Community Enterprise, Entrepreneurial Leadership, Guyanese Women Entrepreneurial, Inclusive Innovation, Intersectional Barriers, Structural Bias.*

Introduction

Entrepreneurial leadership among women in Guyana faces significant challenges stemming from deeply embedded structural biases, cultural norms, and intersecting social barriers. Although women are increasingly participating in the economy by starting their own businesses, they often encounter obstacles such as restricted access to financing, inadequate business training, and limited market opportunities. These challenges are further intensified by societal expectations concerning gender roles, which can limit women's ability to assume leadership positions and grow their enterprises.

Various initiatives have sought to address these issues through targeted programs aimed at empowering women entrepreneurs. These efforts often include leadership training, mentorship, networking opportunities, and improved access to finance. Among these, comprehensive programs that blend leadership

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development with inclusive innovation and community engagement have demonstrated considerable promise in supporting women's sustainable business growth and fostering systemic change.

However, these interventions face limitations, including their scale, sustainability, and the extent to which they align with the unique needs of women navigating multiple social disadvantages. Cultural resistance and gaps in policy enforcement continue to inhibit wide-reaching progress. Moreover, the long-term impact of inclusive innovation efforts is often constrained by limited resources and insufficient integration at community levels.

Despite these challenges, Guyanese women entrepreneurs have made remarkable strides by redefining leadership principles. They adopt approaches that emphasize relational and culturally grounded leadership, prioritizing community well-being alongside economic success. This transformation showcases their resilience and highlights the vital role they play in driving both economic development and social progress, underscoring the need to continue advancing research and supportive policies in this area.

Methods

Description of Site

The study was conducted in Guyana, a rapidly growing emerging economy in South America, characterized by active government and non-governmental initiatives aiming to strengthen women's economic empowerment and entrepreneurship across diverse geographic regions. The target population comprised women entrepreneurs engaged in small and micro enterprises such as agriculture, education, digital services, community development and innovation-driven businesses across urban and rural areas. Some of these programs were supported by institutions like the Cherie Blair Foundation's HerVenture and the Centre for Local Business Development's Accelerate-Her, ActionCOACH initiatives. The selection of Guyana as the research site was informed by its unique socio-political landscape, where women-led enterprises are gaining visibility amidst persistent gendered constraints [1].

Description of the Experiment Done

This study utilized a qualitative research design involving multiple qualitative "experiments" in the form of semi-structured interviews and focus group discussions (FGDs) with women entrepreneurs across Guyana. The goal was to explore how these women navigate structural bias, cultural expectations, and intersectional barriers through leadership and inclusive innovation. A purposive sampling technique was employed to recruit forty (40) women entrepreneurs from diverse sectors agribusiness, retail, community enterprises, and service industries across urban and rural settings. Participants underwent in-depth interviews to provide rich narrative data about their leadership approaches, entrepreneurial challenges, and community-based innovations. Additionally, Focus Group Discussions were conducted with cohorts participating in programs like the Cherie Blair Foundation's HerVenture and the Centre for Local Business Development's Accelerate-Her initiative to understand collective experiences and shared barriers [2-4].

Description of the Laboratory Methods

Given the social and behavioural nature of the research, experiments were conducted as fieldwork rather than in a traditional laboratory setting. Data collection involved: recording and transcription of interviews and focus group discussions use of digital audio recorders and secure storage to ensure data integrity, application of ethical protocols including informed consent, anonymity, and respect of cultural sensitivities. Transcriptions were processed using NVivo qualitative data analysis software to code textual data and identify thematic patterns. The laboratory in this context

refers to qualitative field research facilities and analytic software infrastructure supporting rigorous data management and analysis [5, 6].

Description of Statistical Methods Used

Though qualitative data was the focus, descriptive statistical methods were employed to summarize demographic and contextual variables of participants. Frequency counts and percentages described participant characteristics such as age, sector, business size, and participation in entrepreneurial programs (See Table 1). These were presented in tabular format to complement qualitative findings.

Thematic analysis was the core analytical method, systematically identifying themes such as adaptive leadership styles, innovation application, and community enterprise dynamics (See Table 2). Coding of transcripts followed [7] six-step process, ensuring trustworthiness through iterative coding, peer debriefing, and triangulation with program documentation and secondary data [7, 5].

Table 1. Participant Demographics

Characteristic	Number of Participants	Percentage
Age Group		
18 – 30 years	10	25%
31 – 45 years	18	45%
46 years and above	12	30%
Business Sector		
Agribusiness	15	37.5%
Retail	10	25%
Community Enterprise	8	20%
Services	7	17.5%
Program Participation		
HerVenture	20	50%
Accelerate-Her	15	37.5%
None	5	12.5%

Table 2. Thematic Categories and Codes

Theme	Description	Sample Codes
Adaptive Leadership	Redefining leadership roles with flexibility	Empowerment, Relational, Leadership
Overcoming Structual Bias	Strategies used to navigate gender and social biases	Financial Access, Social Networks
Inclusion Innovation Practices	Application of innovative community solutions	Technology Use, Cooperative Models
Cultural	Negotiating traditional gender norms	Family Roles, Social Expectations

This methodological approach provides a comprehensive, rigorously structured process to understand Guyanese women's entrepreneurial leadership and innovation in context. It effectively blends qualitative depth with quantitative clarity, ideal for management research focused on social entrepreneurship and gender studies [2, 5, 7].

Results

Participant Demographics

The study included 40 women entrepreneur's representatives of Guyana's diverse economic sectors. Participants' ages ranged from 18 to over 46 years, with most falling within the 31–45 years group (45%) (See Figure 1). Business involvement spanned agribusiness (37.5%), retail (25%), community enterprises (20%), and services (17.5%) (See Figure 2). Half engaged in the Cherie Blair Foundation's HerVenture program, 37.5% participated in the Accelerate-Her program, with 12.5% not affiliated with formal entrepreneurial initiatives [8] (See Figure 3).

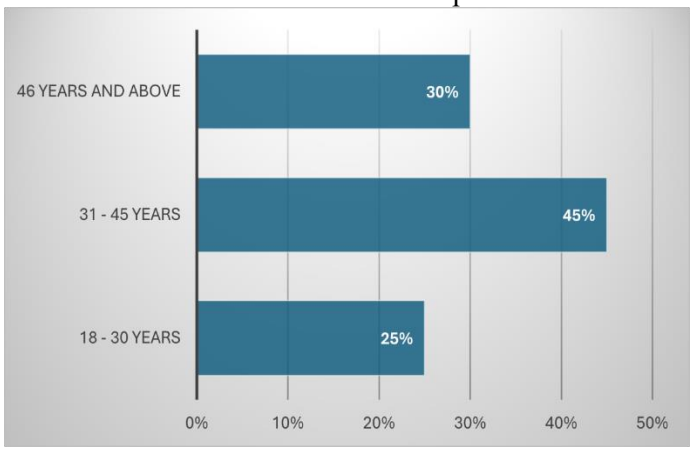

Figure 1. Participants Age Range

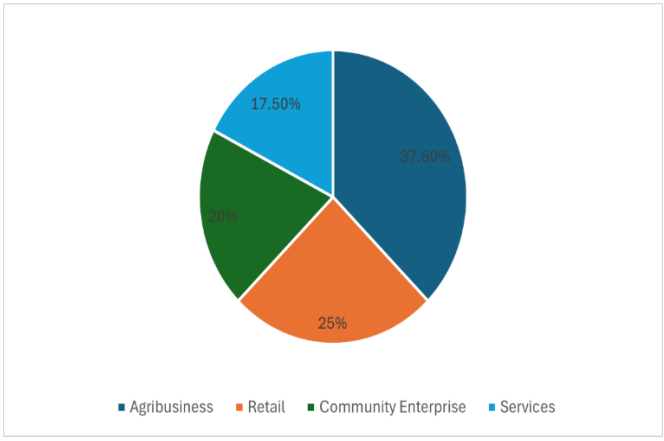

Figure 2. Business Involvement

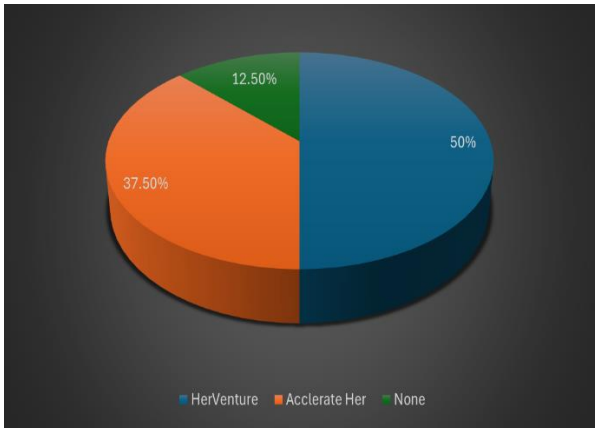

Figure 3. Program Participation

Thematic Analysis

Adaptive Leadership

Women entrepreneurs described leadership as adaptive and relational, emphasizing social connectedness and emotional intelligence. This leadership style balances cultural/familial duties with business goals, reflecting an emerging model of feminine leadership that nurtures collaboration and community trust [7, 5]. This finding is consistent with qualitative research highlighting how relational leadership fosters empowerment and resilience among women entrepreneurs across the Caribbean, emphasizing the integration of social, cultural, and emotional dimensions in shaping entrepreneurial success [9].

Overcoming Structural Bias

Structural challenges—particularly gender bias in financial systems and lack of market access—were pervasive. Participants adopted networking and mentoring strategies augmented by entrepreneurship programs. These approaches enabled resource access and counteracted systemic barriers, consistent with ecosystem studies underscoring the role of capacity-building initiatives in enhancing women's economic participation [10, 11].

Inclusive Innovation Practices

Women embraced inclusive innovation by integrating accessible technologies and cooperative business models that address community needs while scaling their ventures. Adoption of affordable digital tools and collaborative practice fosters both business agility and social impact, paralleling global trends in innovation-led inclusive entrepreneurship [12, 6].

Navigating Cultural Expectations

Participants continuously negotiate family, gender, and societal expectations to legitimize and support their enterprises. Success in reconciling leadership with cultural norms leads to enhanced community acceptance and sustainability.

Quantitative Analysis

Quantitative indicators reveal significant insights into the entrepreneurial ecosystem:

1. Approximately 91% of women-owned businesses in Guyana are formally registered, reflecting a relatively high formalization rate [13].
2. The majority of these businesses (95%) are micro-entities with fewer than 10 employees, and 82% report annual revenues under US$50,000, indicating scaling challenges [13].
3. Program participation among the sample (87.5%) mirrored rising enrollment trends in supportive entrepreneurial programs nationally [2].
4. Access to capital remains a dominant barrier, with roughly 50% citing this as their principal challenge; 49% identified work-life balance as another key constraint [14].
5. Digital integration rates are increasing, with 20% adopting mobile money and e-commerce tools, facilitated by program-led digital literacy initiatives.
6. Women entrepreneurs in Guyana exhibit a 5% higher likelihood of innovativeness relative to male entrepreneurs, reflecting dynamic entrepreneurial behaviour [15].

Table 3. Key Quantitative Indicatiors

Indicators	Statistic
Formal Registration Rate	91%
Micro Size Businesses (<10 employees)	95%
Annual Revenue < $50,000	82%
Program Participation (Sample)	87.5%

Access to Capital Barrier	50%
Work – Life Balance Barrier	49%
Digital Tool Adoption	20%
Women Innovativeness vs Men	+5%

These comprehensive results highlight the multifaceted leadership styles and innovation practices of Guyanese women entrepreneurs (See Table 3). They underpin the importance of ecosystem support programs and reveal ongoing challenges, especially regarding finance and cultural expectations, vital for informing policy and practice aimed at empowering women entrepreneurs in developing economies [6, 7, 12, 13].

Discussion

The results of this study align closely with the primary objectives outlined in the introduction, which aimed to explore how Guyanese women entrepreneurs navigate structural biases, cultural expectations, and intersectional barriers through adaptive leadership and inclusive innovation. The demonstrated prevalence of relational leadership approaches confirms the objective to identify leadership styles that empower women-led enterprises in a socio-cultural context. The detailed identification of structural challenges such as limited financial access, alongside adaptive responses through social networks and program participation, fulfills the objective of uncovering barriers and enablers in the entrepreneurial ecosystem. Furthermore, findings on the adoption of technological tools and community-centric business models advance the understanding of inclusive innovation tactics, supporting the goal to explore innovative strategies that promote sustainability and growth within women-led businesses.

The results underscore the prominence of adaptive and relational leadership among Guyanese women entrepreneurs as a critical factor in navigating the complex interplay of cultural expectations, structural barriers, and economic challenges. This leadership style, characterized by emotional intelligence, flexibility, and prioritizing community and relational dynamics, is particularly well-suited for the Caribbean context where social and familial networks deeply influence business operations [9]. This finding aligns with research by [16] , which highlights transformational and participative leadership styles among women entrepreneurs as positively impacting psychological wellbeing and organizational effectiveness. Similarly, qualitative studies in the Caribbean report that women entrepreneurs balance entrepreneurial ambitions with social roles using relational strategies, enhancing both their legitimacy and business sustainability [9]. Moreover, this leadership approach is reinforced by [17] comprehensive meta-analysis that associates adaptive leadership with increased team cohesion and resilience, particularly in socially complex environments. The emphasis on relational leadership is also supported by [18] findings that highlight the centrality of emotional intelligence in female-led business sustainability in Latin America and the Caribbean.

Consistent with existing literature, the persistent structural bias against women entrepreneurs in financial access and market opportunities manifests strongly in this study. Women's strategic use of social capital and mentoring networks reflects adaptive resilience strategies, echoed in the work of [10] and the [11], who emphasize capacity-building as a crucial enabler in Latin America and the Caribbean. The government and nonprofit programs, such as HerVenture and Accelerate-Her, provide vital training and advocacy tailored to women's unique socio-economic positions [19]. However, sustained investment and culturally sensitive policies remain

essential to dismantle entrenched gendered barriers and enhance equitable access to funding. Furthermore, the research by [20] highlights how intersectional barriers, including ethnicity and class, compound these structural challenges, calling for multifaceted policy interventions.

The ability of women entrepreneurs to integrate inclusive innovation practices, especially affordable and accessible technologies, supports their growth despite resource constraints. This trend corresponds with regional reports on digital economy participation in the Caribbean, which detail increased uptake of mobile payments, digital marketing, and e-commerce driven by tailored capacity development programs [12]. However, digital literacy gaps and unequal infrastructure access signal a need for targeted digital inclusion policies to enable women-led enterprises to fully capitalize on innovation opportunities. Supporting this view, the study by [21] documents how tailored digital literacy initiatives improve adoption rates and entrepreneurial outcomes among women in rural Caribbean communities.

The study reveals women's continuous negotiation of cultural and gender norms as essential for their entrepreneurial legitimacy and success. Aligning business leadership with familial and community expectations enables women to garner social support, essential in close-knit Caribbean societies [4]. This dynamic reflects an emerging model of leadership that is neither purely transformational nor transactional but deeply embedded in social and cultural relations, creating a distinct pathway for women's empowerment and societal impact. This perspective is further elaborated by [22], who argue that such culturally embedded leadership fosters greater community resilience and gender-equitable development outcomes.

Directions for Future Research

Given the complexity and multiplicity of factors revealed, future research should adopt interdisciplinary and longitudinal approaches to better understand the evolving entrepreneurial ecosystem for women. Key areas include:

1. The longitudinal effectiveness of tailored entrepreneurship programs in enhancing business performance and leadership capacity over time.
2. Quantitative studies on how intersectional identities (age, ethnicity, socio-economic status) interact with entrepreneurship outcomes in Guyana and the wider Caribbean.
3. Mixed-methods research to explore male allies' and community stakeholders' roles in reshaping local gender norms.
4. Investigations into digital divides affecting entrepreneurship, focusing on infrastructure, literacy, and technology adoption barriers faced by women.

Such multi-dimensional investigations would enable stakeholders to design more nuanced, evidence-based interventions that holistically support women's entrepreneurship growth and transformation in Caribbean contexts.

Conclusion

This study provides a compelling examination of how women entrepreneurs in Guyana navigate the multifaceted challenges posed by structural biases, cultural expectations, and economic barriers. The findings clearly show that adaptive and relational leadership styles are central to their entrepreneurial success, enabling them to balance business goals with community and family obligations. This leadership approach fosters empowerment and resilience in a socio-economic landscape that remains highly gendered and complex [9].

The results confirm that women face persistent structural barriers especially limited

access to finance and market opportunities which they strategically address by leveraging social networks and participating in targeted entrepreneurial programs such as HerVenture and Accelerate-Her. These initiatives play a critical role in enhancing women's business skills, confidence, and access to inclusive innovations, echoing findings from prior research and regional development reports [10, 11].

Despite observable progress in digital adoption and innovation, ongoing challenges remain in digital literacy and infrastructure access, both crucial factors for scaling women-led enterprises. Participants also highlighted the important interplay of cultural norms which women must skilfully negotiate to attain legitimacy and community acceptance while pursuing their entrepreneurial ambitions [4].

Given these findings, there are significant implications for policy and practice. Supporting women entrepreneurs requires sustained investment in gender-sensitive financial products, entrepreneurship education, and digital inclusion policies that consider the socio-cultural context unique to Guyana. Furthermore, fostering networks and mentorships that leverage relational leadership strengths can amplify impact and business sustainability.

Future research should focus on longitudinal studies to assess the lasting impact of entrepreneurship programs on business growth and women's empowerment. Investigating intersectional factors such as ethnicity and socio-economic status will deepen understanding of intra-group variations in entrepreneurial experiences. Additionally, exploring the roles of male allies and community stakeholders could provide insights into systemic cultural shifts necessary to achieve gender-equitable entrepreneurship ecosystems.

In conclusion, Guyanese women entrepreneurs are powerful agents of economic growth and social transformation. Their leadership, innovative approaches, and resilience demonstrate immense potential to drive inclusive and sustainable development across the country. To fully realize this potential, integrated support from policymakers, development partners, and the private sector is essential to unlock opportunities and reduce barriers faced by women-led enterprises.

Conflict of Interest

The author declares that there are no known conflicts of interest associated with this research study. The study was conducted independently without any financial or commercial relationships that could influence the design, data collection, analysis, interpretation, or reporting of the results. All efforts were made to ensure the objectivity, integrity, and ethical compliance of the research process. Any potential non-financial conflicts, such as personal or professional relationships, have been transparently disclosed and managed in accordance with institutional research ethics guidelines.

Ethical Approval

Ethical approval was obtained from the Texila American University's. Informed consent was secured from all participants, and pseudonyms were used to protect identities. The participatory nature of the research ensured that women entrepreneurs were not merely subjects but co-creators of knowledge.

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References

[1]. Williams, T., 22nd February 2022, "Guyana Chronicle,". https://guyanachronicle.com

[2]. Claire Blair Foundation for Women, "HerVenture in Guyana," 2025. https://cherieblairfoundation.org.

[3]. Centre for Local Business Development, 2021, "Women's Entrepreneurship Programs,". https://centreguyana.com.

[4]. Youth. Challenge International, 2011, "Women's Entrepreneurship in Guyana,". https://ycicanada.wordpress.com.

[5]. Bryman, A., 2016, "Social Research Methods," *Oxford University Press.*

[6]. U. N Women, 2024, "Women's health and experience qualitative report Guyana," 2024. https://guyana.un.org.

[7]. Braun, V., & Clarke, V., 2006, "Using thematic analysis in psychology," *Qualitative Research in Psychology*, vol. 3(2), pp. 77-101.

[8]. C. f. L. B. Development, "Women's Entrepreneurship programs," 2021. https://centreguyana.

[9]. Esnard, T., 2016, Entrpreneurial women in the Caribbean: Critical insights and policy implications, *University of the West Indies Press.*

[10]. W. International, 2023, "WEConnect-Guyana stakeholder ecosystem mapping,". https://we3a.org.

[11]. IDB (Inter-American Development Bank), 2025, "Guyana's women entreprenuers:Realising the potential,". https://www.iadb.org.

[12]. OECD, 2017, "Inclusive innovation policies: Lessons from international cse studies,". https://www.oecd.org.

[13]. Women Entrepreneurs Aspire, 2023. https://we3a.org.

[14]. Women Chamber of Commerce and Industry Guyana, 2024, "*Annual Report on Women entrepreneurs in Guyana*," https://wcciguyana.com.

[15]. Global Entrepreneurship Monitor (GEM) Consortium, 2025, "Global entrepreneurship monitor report,". http://gemconsortium.org.

[16]. J. &. P. S. Challa, "Influence of leadership styles of women entrepreneurs on their psychological wellbeing," *International Journal of Professional Business Review* , vol. 8(6), no. e00293, 2023.

[17]. Bass, B. M., & Riggio, R. E., 2022, Transformational leadership (4th ed.), *Psychology*.

[18]. Lopez, M., & Rivera, G., 2024, "Emotional intelligence and businesssustainaility: Women entrepreneurs in Latin America," *International Journal of Business and Social Science*, vol. 15(2), pp. 78 - 93.

[19]. World Bank, 2025, "Gender equality and women's economic empowerment," *World Bank Publications*.

[20]. Fernandez, L., & Stewart, J., 2024, "Intersectionality and entrepreneurship: Addressing compunded barriers for women in Latin America and the Caribbean," *Journal of Gender and Development*, vol. 32(1), pp. 45 - 60. https://doi.org/10.1234/jesc.v12i3.5678

[21]. Martin, T., & Chu, K., 2023, "Digital literacy and entrepreneurial successamong rural woman in Caribbean," *Technology an Society*, vol. 40(3), pp. 112 - 129.

[22]. Thomas, H., & Mitchell, R., 2024, "Socially embedded leadership and community resilience: A Caribbean perspective.," *Leadership Quaterly*, vol. 35 (2), pp. 145 -163.

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Reimagining Health Systems for Better Health: Strategic Recommendations for Strengthening Health Workforce in Botswana – A Qualitative Study

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Abstract

The global shortage of healthcare workers, particularly in low-and middle income countries, poses a significant challenge to achieving Universal Health Coverage (UHC) and the Sustainable Development Goals (SDGs). This study aimed to explore stakeholder's perspectives on the underlying factors contributing to the shortage of healthcare workers and to identify actionable strategies for addressing these challenges. In depth interviews were conducted with 38 key informants guided by the World Health Organization's Global Strategy on Human Resource for Health: Workforce 2030. Thematic analysis revealed several underlying issues, including the absence of reliable human resource data to inform planning, skills mismatches; ineffective recruitment and retention strategies, limited career progression, poor staff motivation, internal and external migration and frequent leadership turnover.Stakeholders proposed recommendatins such as, flexible staffing models(e.g. short-term contracts)the use of workload indicators to guide staffing decisions, the development and utilization of robust human resource information system, and the implementation of context training programs and mentorship programs delivered on-site. Additionally, stakeholders emphised the importance of improving workplace conditions, enhancing proffesional development opportunities, and strengthening staff motivation to reduce burnout and improve retention, particularly in underserved areas. The findings highlight the need for integrated, data driven, contextual relevant approaches to human resource planning and development.

Keywords: *Human Resource for Health, Policy Implementation, Stakeholder Engagement, Workforce Planning and Development.*

Introduction

As countries strive to achieve the World Health Organization Global strategy on human resources for health: Workforce 2030, the healthcare sector's escalating crisis marked by a critical shortage of health workers. The World Health Organization (WHO) Global strategy on human resource for health: Workforce 2030 provides a comprehensive framework to guide global and national efforts in addressing health workforce shortages and maldistribution. It emphasizes cross-sectoral policy coherence, particularly among the education, migration, labour, and health sectors, and advocates for a systems-based approach to health workforce development [1]. WHO projects a shortfall of 10 million healthcare workers by 2030, a notable increase from the estimated decifit of 7 million deficit a decade earlier [1]. This shortage spans a broad range of healthcare professionals, including physicians, nurses, midwives and allied health workers. The root causes are multifaceted, including insufficient training capacity, inadequate financial and non-

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financial incentives, and weak retention strategies [1]. Low- and middle-income countries (LMICs), particularly those in sub-Saharan African are dispropriately affected. WHO 2023 reports that Sub-Saharan Africa alone faces a shortage of 2.4 million doctors and nurses, while South-East Asia and Africa experience combined deficits of 6.9 million and 4.2 million healthcare workers, respectively [2].

Despite growing concern, over skills mismatches, effective health workforce planning remains constrained by insufficient or fragmented data. Ikhurionan et al [3]emphasizes that the discrepancy between perceived shortages and actual workforce data hinders evidence based decision making. In Botswana, these challenges are particularly acute. The country faces an array of issues including unreliable Human Resource for Health (HRH) data, skills mismatch, poor working conditions, limited retention strategies, fragmented health information systems, internal and external migration of health professionals. Rural urban disparities further overburden the worker force and compromise healthcare delivery[1, 4]. These challenges not only threaten threaten national health outcomes but hinder socio economic development. Innovations such as telemedicine, digital health education, and artificial intelligence offer promising avenues for addressing workforce shortages, especially in underserved areas [5].

For countries like Botswana, a bold and integrated approach is necessary, one that prioritizes public-private partnerships, strengthens international collaboration, and promotes the scalable of digital solutions. This study aims to explore stakeholder's perspectives on the underlying factors contributing to Botswana healthcare workforce shortages to identify actionable recommendations to address these challenges effectively.

Methods

Study Design

A cross-sectional qualitative study was conducted within Botswana's, Ministry of Health (MoH) to gain an insight into the current experiences and perspective of key stakeholders regarding the Human Resource for Health (HRH) landscape from different relevant sectors. The cross sectional design enabled the researcher to explore these perspectives at a single point in time, without the need for longitudinal follow-up. Data were collected through the key informat interviews with stakeholders across multiple sections relevant to HRH policy implementation.

Study Setting

The study was conducted in Botswana, with particpants recruited from both national and sub-national levels of the health system. Interviews were conducted with individuals who are actively engaged in HRH functions within government institutions, developing partner organisations, and the private health sector.

Study Population and Sampling

The study targeted a diverse group of policy makers with varying responsibilities related to HRH. A total of 38 key informants participated, including policy makers, program managers, senior executives, focal persons within the Ministry of Health, as well as representatives from development partners, other government ministries and private institutions involved in healthcare education and service delivery. Purposive sampling was employed to ensure the inclusion of individuals with direct roles in HRH planning, administration, training, distribution, and other relevant functions. Eligibility criteria included current employment within the MoH, or affiliated sectors and active involvement in HRH policy, planning or implementation.

Data Collection

Data were collected though face-to-fac,e in-depth interviews lasting approximately 40 to 60 minutes. Interviews were conducted at particpants' workplaces to ensure convenience and maintain confidentiality. This setting also also fostered openness, allowing informants to speak freely about sensitive issues related to HRH. An interview guide was used to steer the conversation, featuring open-ended questions aligned with the objectives of the WHO's Global Strategy on HRH: Workforce 2030. All interviews were audio recorded with the particpants' consent to ensure accuracy and support comprehensive thematic analysis. The face-to-face format facilitated interactive dialogue, enabling the interviewer to probe deeper into responses to capture nuanced perspectives. Prior to the interviews, particpants were informed about the purpose of the study, the voluntary nature of their involvement and the confidentiality of their responses. Written consent was obtained from all informants before the commencement of the interviews.

Data Collection Procedures

The lead researcher identified and contacted potential informants and coordinated with trained research assistants to arrange and conduct the interviews. Research assistants received training on qualitative interviewing techniques and were briefed on the study obejctives, ethical considerations and detailed procedures for obtaining informed consent Each interview was conducted face to face, with both the researcher and research assistants ensuring a consistent and ethical approach throughout the data collection process.

Data Analysis

All audio-recorded interviews were transcribed verbatim by the lead researcher, with the support of the two trained research assistants. Transcripts were carefully reviewed to ensure accuracy and completeness. Thematic analysis was employed to interprete the data. This involved , an initial through reading of the transcripts, during which preliminary notes and patterns were documented. Open coding was then applied to identify recurring concepts, which were grouped into broader thematic categories. To support thematic analysis, ATLAS.ti. (Version 9) software was utilized. The software facilitated the identification, coding, catergorization, of themes across All scripts, ensuring consistency and depth in interpretation. Additionally, the process included regular consultation and collaborative discussions with the co-authors, who also served as the study's academic supervisors to enhance analyitical rigor and credibility.

Ethical Considerations

Ethical clearance of the study was obtained from the Ministry of Health in Botswana and the Institution Review Borad (IRB) of Texila American University. A research permit was granted prior data collection. Written informed consent was obtained from each informant prior the conduction of the interviews, ensuring compliance with ethical standards regarding confidentiality and particpants' rights.

Findings

A total of 38 Key informants participated in the study. The majority (84%) were affiliated with the MOH, while 3% represented the Human Resource Development Council (HRDC) and the remaining (13%) were drawn from various other organizations relevant to health workforce development. Interms of gender distribution, over half of the participants (55%) were females. Rgarding educational background, a significant proportion (68%) of the informants held a master's degree. Additionally, the majority (58%) reported having more than 20 years of professional experience, indicating a higher level of expertise and familiarity with the HRH landscape in Botswana (Table 1).

Table 1. Study Participants Demographics

Variables	f	%
Organization type		
MOHW	32	84
Regulatory Body (Health Professionals)	2	5
Academic institutions	3	8
HRDC	1	3
Partners	1	3
Type of Organization		
Government	33	87
Private	1	3
Parastatal	3	7
Multilateral	1	3
Gender		
Males	17	45
Females	21	55
Age groups		
18 – 25	0	0
26 – 35	5	13
36 – 45	13	34

Health Workforce in Botswana

Thematic analysis of the interviews revealed several recurring issues contributing to the shortage of healthcare workers in Botswana (Table 2). These include the lack of reliable human resource data which hamperes effective planning and development; a persistent mismatch between valuable skills and health system needs; inadequate recruitment and retention strategies. Additionally, low staff motivation and limited opportunies for career progression were identified as key drivers for both internal and external migration of healthcare workers. Frequent changes of staff including executives further disrupts continuity and weaken the implementation of human resource strategies. These challenges collectively undermine efforts to build a resilient and sustainable workforce.

Table 2. Areas of Inquiry and Emerging Themes

Area of Inquary	Emerging Themes
Lack of HR data	• HR information systems not updated, incomplete and not reliable • HR decision making not based on data/evidence • No strategy to inform decision and activities
Poor skills match	• Lack of speciality training for doctors, nurse and allied health professionals

	• Ineffective strategies for training selection • Shortage of manpower • Poor distribution of available healthcare workers
Inefficient recruitment and retention strategies	• Extended vacancies • Poor working conditions • Employee welfare, unresolved grieviances
Lack of motivation and progression	• Internal and external migration for greener pastures
Frequent leadership change	• Lack of continuity of plans • Frenquent changes and decisions

Lack of HR Data

The findings highlight significant deficiencies in Botswana's Human Resource Information System (HRIS). The data is often incomplete therefore unreliable. Concerns raised by participant were that human resource information systems were fragmented. Moreover, there is a notable lack of comprehensive, evidence-based reports and plans, highlighting the limited use of data-driven decision-making. Additionally, this fragmentation promotes a siloed approach to addressing HRH issues, undermining coordination.

Gaps in HRH Data, Strategy and Implementation

Participants further indicated the absence of a centralized repository of healthcare workforce data, including training and specialization records. This limits the ability to assess workforce needs accurately and to align training with service demands. The lack of data driven work force planning contributes to inefficiencies in recruitment, deployment and retention strategies. These challenges were attributed to several factors, included limited financial resources, inadequate staffing for HRIS management and inconsistent reporting from health facilities. The collective results is a weakend capacity to generate evidence informed HRH policies and long term strategic plans.

As **Participants 10** noted : *"there is lack of funds, shortage of staff and fragmented health information from facilities, that also contribute to none implementation of available plans.*

Participants also raised significant concerns about the absence of a coherent and upto date HRH strategy to guide workforce development and planning. Many that ended in 2016 were unaware of any such a strategy to guide workforce development and planning. Many were unaware of any strategy, while others reported that the previous strategy which ended in 2016 was never fully implemented or evaluated.

Participant 1 observed: "*We don't have, like for instance, it's my first time to hear about the HR planning but looking at what is happening here, do we have a consistent training plan in the ministry? The answer is no, our hospitals or facilities, do they have a training plan? I think the answer is no. If it's there, do they follow it?*" similarly, other participants expressed uncertainty or lack of access to the strategy:

Participant 5: "*the* strategy is available but obsolete/ outdated"

Participant 6: *"I don't know "* when asked if there is any HRH strategy

Participant 7: stated that *"I have never seen it"*.

Participants also emphasized that the lack of strategy dissemination, and inadequate monitoring and evaluation mechanisms made it difficult to track HRH progress or targeted intervensions. The absence of structured training plans and misalignment between training and actual workforce needs were also highlighted. These limitations were seen as barriers to building a resilient and well distributed health workforce, particularly in underserved areas.

Skills Mismatch, Training Gaps and Workforce Training Gaps

The findings revelead significant concerns regarding skills mismatch between the available health workforce skills and actual needs of the health system. Particpants attributed this primarily to the absence of a comprehensive human resource skills inventory and weak HRH information systems, which make it difficult to track, assess, plan for workforce capacity effectively.

Participant 18 emphasised the importance of conducting a national level skills audit stating *"the ministry should conduct a skills audit to identify which cadres record a higher shortage than others then use the results of the audit to inform the training plan"*.

A reccuring theme among particpants was the lack of specialized training opotunities for doctors, nurses and allied health professionals. Several participants noted that training programs had stalled over time, exacerbating the shortage of skilled proffessionals in key areas. **Participant 18** further explained: "*Training is a challenge in the local allied personnel they are few who are trained even when you advertise they will not be available to fill the posts e.g. therea was an advert for occupational therapists and no single person applied since there are not available it ended up attracting personnel outside the country*".

The discontinuation of specialist nusing programs was highlighted as one of the major problem affecting shortage of skills and service delivery.

As **Participant 5** noted: "*there has been a decline in the number of specialists, the nurses that are being produced. From GIHS, and I'm not sure how familiar you are in terms of health, we used to have anesthetic nursing in Gaborone Institute of Health Sciences (GIHS). The program was stopped around 2013, 2014. We used to have community health nurses. We used to have mental health nurses. Family Nurse Practitioners (FNPs). We had anesthesia, community health, and ophthalmology programmes. These three have been stopped. So that means there has been a regression from that area"*.

Additionally, **Participant 9** highlighted the importance of developing nurse specialist roles to support medical specialists and improved team based care: "*as much as we have the different medical specialists, we should have different nurse specialists because they will be able to work together hand in hand without necessarily just taking instructions. This nurse can do something even before the arrival of this doctor. I think as we plan for these people we must look at who is going to work in this field*"

These insights underscore the urgent need for better workforce planning tools, targeted training programs and strategies to ensure alignment between training outputs and the evolving healthcare demands in Botswana. Despite these gaps, participants acknowledged that the ministry is currently training healthcare personnel both locally and abroad.

Participant 5: "*I think this will be the largest number graduating, even from outside, that will be about 38 specialists. From next year, there will be close to 50 specialists graduating. The majority of those from University of Botswana (UB), but if you add others from other countries, it will go to 50"*.

Participant 5 further mentioned that "*there has been a decline in the number of specialists,*

the nurses that are being produced. From GIHS, and I'm not sure how familiar you are in terms of health, we used to have anesthetic nursing in GIHS. The program was stopped around 2013, 2014. We used to have community health nurses. We used to have mental health nurses. FNPs. We have anesthesia, community health, and ophthalmology. These three have been stopped. So that means there has been a regression from that area".

However, training efforts were viewed as uncoordinated and data blind. Several particpants noted that there was no formal training plan, and that training decisions were made in silos.

Participant 20: "*from our side, we need one, two, to send four people for this, or we need this year's. But I will say what I say from my unit, somebody else from their unit, and there is no coordination where you can probably harmonize your thoughts*".

Parrticipant 1: " *We don't have, like for instance, it's my first time to hear about the HR planning but looking at what is happening here, do we have a consistent training plan in the ministry? The answer is no, our hospitals or facilities, do they have a training plan? I think the answer is no. If it's there, do they follow it".*

Participant 5 : "*the strategy is available but obsolete/ outdated".*

There were concerns about workforce distribution particularly the disconnect between HR administration and HRH planning. . Particiants described a lack of coordination that has lead inequitable staffing across facilities, with some institutions being severely understsffed.

Participant 19: "*I think currently there is a misunderstanding between HRH and HR administration. We need to be working together but if HRH is here with policy and planning, and then you have HR who are hiring and distributing personnel there without being informed by us, then whatever we are doing here is just for the group*".

The issue of career progression after training was another area of frustration. Participants explained that even after completing specialized training, staff often return to the same posts with no opportunity for promotion or advancement.

Participant 4: *"If you don't have posts, how are you going to fill up vacancies or fill up facilities anywhere? Most people, when they come back, they resume their duty where they were before going for training. And then some are disgruntled, obviously, because after training, you expect your life to change or to improve. Some people have come back after training and have been in that position for the past 10 years". This may lead to em*ployees becoming disgruntled".

The lack of established posts, limited opportunities for progression, and delayed or absent promotions were cited as key demotivators or factors contributing to both low morale and workforce attrition.

A reccuring theme among participants was the deficiency of recruitment and retention strategies, which has significantly affected the health workforce landscape in Botswana. Many health proffessionals, particularly nurses and specialists, are migrating in search for better opportunities, both locally and internationally. Particpants consistently emphasized the urgent need for robust, well implemented retention stratergies to address this persistent challenge.

Participant 16: "*we need a retention strategy. Without one, we are doomed. So we don't have. We will train, they will leave for greener pastures. And that is our biggest challenge".*

Despite some existing incentives, they were widely viewed as insufficient and unattractive, particularly when compared to opportunities abroad. Vacancies often remain unfilled due to either lack of suitable candidates or unattractive terms of employment.

Participant 19: "*we train people who are supposed to be specialists, who are supposed to be experts, and then naturally leave. This A A*

specialists are so important. Nurses and doctors, you'll find that they move".

Participant 20: *"when you have the best specialists living, you are then going to have a problem. And then, you know, this weakness, people are unhappy, creates a toxic working environment*". *The migration of skilled nurses has been particularly impactful. According to Nursing and Midwifery Council of Botswana (MCB), approximately nurses apply to leave the country every week, with many being master's degree holders. This creates severe staffing shortages, particularly in underserved and rural areas.*

Participant 11 further reiterated the loss of skilled manpower when stating that "*we've been losing other professionals, like the nursing professionals to other countries due to the issue of salaries, better salaries , looking for greener pastures".*

Particpants recommended drawing from international best practices, such as Ethiopia's approach which includes financial and nonfinancial incentives as well as career progression opportunities, to help retain health workers in difficult to reach areas. Another major issue raised was employee welfare and unresolved grievances. Particpants pointed out that personnel felt ignored or mishandled by the system, with some resorting to court action to resolve work related disputes. The lack of timely resolution and mechanisms has contributed to low morale and frustration.

Participant 4: *"I'm going to be nice and say 85% of the health care workforce are disgruntled. There's no regulation, optimum regulation because of HR issues. So, issues are not properly handled unless in a court of law and not everyone can go to court".*

In addition to human resource challenges, participants cited inadequate resources and equipment in health facilities as a major demotivating factor. The resource shortage hinders the ability to perform optimally, further compounding dissatisfaction and attrition.

Participant 20: "*Not looking into the issues of welfare especially in ensuring that there is availability of equipment in the health facilities, and they are fully functional always so that they can perform their duties effectively to their clients hence these personnel they get frustrated and leave the country*".

Lack of Motivation and Career Progression

An important theme that emerged from the participants was the lack of motivation and limited opportunities for career progression within the health sector. Several health workers expressed dissatisfaction regarding the prolonged stagnation on the salary scale, even after undergoing training or obtaining higher qualifications.

Participant 4: *"If you don't have posts, how are you going to fill up vacancies or fill up facilities anywhere? Most people, when they come back, they resume their duty where they were before going for training. And then some are disgruntled, obviously, because after training, you expect your life to change or to improve. Some people have come back after training and have been in that position for the past 10 years". This may lead to em*ployees becoming disgruntled.

This issue was cited as the major demotivating factor, contributing to employee dissatisfaction ultimately to health workers migration, as individuals leave in search of better working conditions and advancement opportunities.

Participant 7: *"You train nurses, the few that you have, the few midwives that you have. And next thing they go for greener pastures. Migration of nurses to greener pastures".*

Participant 16: "*we need a retention strategy. Without one, we are doomed. So we don't have. We will train, they will leave for greener pastures. And that is our biggest challenges".*

Participant 11: "*we've been losing other professionals, like the nursing professionals to*

other countries due to the issue of salaries, better salaries , looking for greener pastures".

Participants also linked poor performance and motivation to broader systematic issues such as inadequate resources, unresolved grievances, unfair distribution, which inturn exacerbate the feeling of being under valued and overworked. These insights strongly point to the need to for structured promotion pathways, equitable training opportunities, and transparent career progression frameworks to motivate and retain skilled proffessionals.

Frequent Leadership Changes and Organizational Structuring

A recurring concern raised by participants was the frequent changes in leadership with the Ministy of Health and constant restructuring, which were seen as a major draw back to continuity and sustainable progress. Participants noted that the new leadership often brought in new priorities, which resulted in on-going initiatives being discontinued or underfunded.

Participant 2: "*one of the biggest problems is that people really don't understand the aspect of policy cycle. So that they end up not doing certain things, leadership is not clear on leadership restructuring"*. This disruption of on - going leadership turnover was particularly problematic in strategic areas such as HRH planning.

Discussions

The study aimed to explore stakeholder's perspectives on the underlying factors contributing to the shortage of healthcare workers and to identify actionable recommendations they propose to address the problem. The study revealed several interrelated challenges, including; lack of reliable HRH data, ineffective recruitment and retention strategies, poor staff motivation and career progression as well as frequent leadership changes within the Ministry of Health. A significant concern identified was the internal and external migration of healthcare workers, particularly nurses, in search for better opportunities leaving the local health system understaffed. This migration has left the local health system severely understaffed, a challenge also seen in other countries like the Philiphines[6]. Although Botswana has attempted to implement retention strategies, they appear insufficient as the health work force continue to migrate. To address this issue, particpants recommended that Botswana develop and implement robust, data informed retention strategies and incentive policies. For instance, Ethiopia's use of financial and non-financial incentives as well as career progression opportunities in underserved areas, offeres a model Botswana could adapt [7].

Addressing these health workforce challenges requires deliberate and strategic action by the Ministry of Health in line with WHO Global Strategy HRH: Workforce 2030 [1]. Suggested actions include: Developing a comprehensive recruitment and retention strategies tailored to different caders of healthcare workers; Strengthening leadership commitment, particularly ensuring that decisions are evidence based and aligned with long term statergic goals; equitable and needs based of training opportunities, guided by facility level data; Establishing a comprehensive HRH information system to support decisions related to workforce distribution, training needs and identifying skills gaps. Participants highlighted that the current fragmentation of the HRH information systems limits the ability to make informed decisions.

The Botswana Health Data Collaborative Roadmap (2024-2030) emphasizes the importance of harmonized and data-driven health decision-making and aligns with global digital health priorities. Botswana can also learn from other countries' best practices. Rwanda for example, is expanding specialized training through international university partnerships [8]. Malawi's task-shifting models

empowers mid-level healthcare workers to fill gaps in service delivery [9]. Additionally, the India-WHO Collaboration for Healthcare training presents another potential avenue.[10]. Botswana could explore partnerships with such international institutions to strengthen its medical education infrastructure and align with global standards [1]. Additionally, the Philippines is known for producing large numbers of nurses, but continues to experience human resource for health crisis. The contributing factor is the migration of a large number of nurses to other countries for better opportunities leaving the local health system understaffed. A challenge that Botswana is grappling with another concern expressed by the participants, was the frequent change in leadership and on going restructuring with the MOH. These shifts often disrupts ongoing initiatives, such as HRH Strategy which remains unimplemented due to lack of funding and leadership continuity. Frequent changes also impact the policy implementation and undermine the consistency of strategic plans. Particpants also called attention to the need for fair allocation of training slots, improved career progression mechanisms, and the development of incentive structures that reward retention and performance. Lack of motivation, career stagnation, and un addressed grieviences were cited as key factors driving discontent and migration among healthcare workers. The challenges identified in this study are complex but insurmountable. With a strong commitment from leadership, investments in HRH systems, and the adoption of data driven planning and retention strategies, Botswana can build a resilient and responsive health workforce. These efforts will enhance health service delivery, improve staff satisfaction, and contribute significantly to achieving both national and global health goals.

While the findings offer valuable insights into the research objectives, it is important to acknowledge the limitations that may have influenced the scope, depth and generalizability of the results. The key limitations of this was time availability, as the researcher conducted the study while managing a full time employment and part time academic commitments. These time constraints limited the scope of the data collection to Gaborone only, excluding potentially valuable insights from other districts. Additionally, scheduling interviews with senior executive within the Ministry posed challenges due to their demanding responsibility and frequent emergencies, which lead to the delayed or missing follow ups with some participants.

Conclusion

Globally, the health sector is facing shortage of healthcare personnel and Botswana is no exception. This study highlighted the urgent need for MOH to implement competitive recruitment and retention initiatives to ensure the sustainability of its health workforce. Furthermore, the importance of a comptrehensive HRH information system was emphazised as a key tool to guide evidence based decision making in planning, deployment, and training of healthcare workers . The study sheds light on the multifaceted challenges contributing to workforce shortages and offers actionable insights, that if implemented, could strengthen Botswana's health system and improved overall health outcomes.

Recommendations

Based on the study findings, stakeholders recommend that the MOH consider the following intervension:

Developing and implementing competitive recruitment and retention strategies, incorporating both financial and non-financial incentives. This includes improving the health flexible contracts (short-term and long term), housing allowances, remote area allowances, and career progression pathways to retain critical healthcare staff.

Establish a comprehensive intergrated HRH information system to harmonize existing systems. This would support effective workforce planning by providing data on staffing levels, distribution,skills gap, and performance indicators.

Invest in comprehensive human resource management system that promote efficiency in recruitment, deployment, appraisal, and succession planning.

Designing and implementing practical skills-based educational training programs including mentorship, on-site continuous professional development (CPD) and speciliality training aligned with health system needs.

Conflict of Interest

The author declares no conflict of interest.

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References

[1]. World Health Organization (WHO). 2016. Global Strategy on Human Resources for Health: Workforce 2030. Retrieved from https://www.who.int

[2]. World Health Organization. 2023. 5th Global Forum on Human Resources for Health.

[3]. Ikhurionan, O., et al., 2022. Health workforce deficits in LMICs: Challenges and solutions.

[4]. Booth, A., et al., 2021. An assessment of human resources for health in Botswana: challenges and strategic priorities. (If used previously in your study).

[5]. Bello, M., Bassey, B., & Agupugo, K., 2023. Integrating Telemedicine and AI to Improve Healthcare Access in Rural Communities. *International Journal of Life Sciences Research Archive*, 4(2), 45–58. Retrieved from https://sciresjournals.com/ijlsra/sites/default/files/IJLSRA-2024-0061.pdf

[6]. Lorenzo, F. M. E., Galvez-Tan, J., Icamina, K., & Javier, L., 2007. Nurse migration from a source country perspective: Philippine country case study. *Health Services Research*, 42(3p2), 1406–1418. https://doi.org/10.1111/j.1475-6773.2007.00716.x

[7]. World Health Organization. 2010. Increasing access to health workers in remote and rural areas through improved retention: Global policy recommendations. Geneva: *WHO*. Retrieved from https://www.who.int/publications/i/item/9789241564014

[8]. Binagwaho, et al., 2013. Human Resources for Health Program in Rwanda.

[9]. Olu, O., Mipando, M., Chimwaza, A., & Chisema, A., 2019. Task shifting in Malawi: Achievements and challenges. *African Health Monitor, World Health Organization Regional Office for Africa*.

[10]. India-WHO Collaboration 2020. Strengthening Medical Education.

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Utilization of Long-lasting Insecticide treated Mosquito Nets amongst Households in Upper River Region, The Gambia

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Abstract

Long Lasting Insecticide-treated bed nets (LLINs) are known to be highly effective in reducing malaria morbidity and mortality. However, there exists availability and usage variations between countries and among households and such may seriously limit the potential impact of nets and cause a negative consequence on malaria transmission. This study examined LLIN ownership and underlying factors that may serve as barriers to utilization amongst households in two districts in Upper River Region. Malaria is the major cause of morbidity and mortality in children and pregnant women. LLINs are an effective option in the prevention of malaria because they serve as a barrier between man and mosquito. However, their utilization among the population is still a problem despite ownership been high. Surveys have shown that the region in which this study was conducted has the lowest utilization rate in The Gambia and the second highest malaria prevalence in the country. The study adapted a structured questionnaire and Focus Group Discussions (FGDs) to better understand the situation of net utilization in the two districts. The study revealed interesting findings: Respondents have clear understanding that LLINs are for the prevention of malaria. Factors such as heat, mesh size of net, texture were very important determinants for a person to use a net. A very important determinant for someone not using a net is the season as a lot of the people belief that mosquitoes are not many during the dry season. Indoor Residual Spraying was one "devil in disguise".

Keywords*: Long lasting Insecticides-treated Bednets, Malaria, Morbidity, Mortality, Prevention.*

Introduction

According to the World malaria report 2018, there were 219 million cases of the disease in 2017, compared to 217 million the year before. Of particular concern is the report's finding that, among the 10 highest-burden African countries, there were 3.5 million more cases in 2017 over the previous year [1]. An estimated 228 million malaria cases and 405,000 malaria deaths occurred in the world in 2018. Of these, 93% of cases and 94% of deaths due to malaria occurred in the African region [1]. The Global Technical Strategy for Malaria 2016–2030 (GTS) calls for reducing malaria cases and deaths by at least 40% by 2020, at least 75% by 2025 and at least 90% by 2030. Without a major turnaround, these targets are unlikely to be met – a challenge further compounded by insufficient levels of funding for malaria control. Investments in 2017 represented less than half of the 2020 US$ 6.6 billion funding target set by the GTS [1].

There has been substantial decrease in the prevalence of malaria globally and also in the African region in the last two decades. Between 2010 and 2015, malaria incidence rates (new malaria cases) fell by 21% and the malaria mortality rate by 31% in the African region. However, the rate of change in decline of

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malaria incidence remained 57 per 1000 at-risk population per year from 2014 to 2018 [1].

Malaria, a preventable, treatable, and curable disease, is a major public health threat in The Gambia. Malaria affects the entire population and is a leading cause of morbidity and mortality, especially among children under age 5 [2]. In The Gambia, malaria is mesoendemic and has a marked seasonal variation. Around 90% of malaria cases occur in the rainy season, which usually lasts from June to October [2].

A malaria-free Gambia is the vision of the National Malaria Control Programme (NMCP), with the goal of reaching pre-elimination by 2020. To achieve this goal, the National Malaria Control Policy outlines strategies including (1) prevention; (2) case management; (3) advocacy, social mobilisation, behavioural change, and communication; and (4) surveillance, monitoring and evaluation, and operational research [2]. The 2014-2020 National Malaria Strategic Plan aims to sustain universal coverage by distributing a sufficient number of ITNs to cover all household members [2]. This indicator is operationalised as one ITN for every two household members. ITNs in The Gambia are distributed through mass distribution campaigns (every 3 years) and through routine child health services targeting children, mothers, and pregnant women [2].

The long-lasting insecticide-treated net (LLIN) is the cornerstone of malaria prevention in sub-Saharan Africa (SSA). Its effectiveness was dependent on universal coverage as well as consistent utilization [3]. Utilization of LLINs reduces the clinical attack of malaria, Plasmodium infection and death due to malaria. It reduced child mortality of all causes by 17%, which corresponds to 5.6 lives each year for every 1000 children protected compared to those who did not use bed nets. In addition, it reduced incidence of uncomplicated episodes of falciparum malaria by almost half [3].

Long-lasting insecticidal nets (LLINs) have played an important role in reducing the global malaria burden since 2000 [4]. They are a core prevention tool used widely by people at risk of malaria. Part of pillar 1 of the Global Technical Strategy for Malaria 2016–2030 (GTS) is to ensure universal coverage for all people at risk of malaria using effective vector control with either LLINs or the other core prevention tool, indoor residual spraying (IRS). Universal coverage for malaria vector control is defined as universal access to and use of appropriate interventions by populations at risk of malaria [5].

Among ITN owners (n=387), 73% of women reported either always sleeping under the net during all trimesters of pregnancy, or always sleeping under the net after they acquired one during pregnancy. The primary reason for not always sleeping under the net was the heat (49%). Women of Muslim religion were less likely to always use a net during pregnancy compared to those of Christian religions. Owning more than 1 net was associated with a slightly increased likelihood of always sleeping under a net during pregnancy. Women in the wealthiest households were less likely to always use a net during pregnancy compared to women living in the poorest households. Participants were read a list of items and then asked to choose which item is the single most important influence over deciding to sleep under an ITN during pregnancy. Women who always slept under an ITN during pregnancy were more likely to be influenced by an advertisement on the radio/poster than being given an ITN free of charge. Paradoxically, women who always used their net during pregnancy were also slightly more likely to believe that sleeping under an ITN might be dangerous during pregnancy. No differences were found between other socio-demographic factors, pregnancy history, ANC use or socio-cultural factors [6].

About three-quarters (10,635, 74.0%) of all inspected bed nets were hung for use. Of the

35,419 people reporting sleeping in their households the previous night, fewer than three-quarters 25,896, (71.4%) reported sleeping under a bed net the previous night. Among children under five, the majority (79.3%) were reported sleeping under an LLIN the previous night while 81.5% reportedly slept under a bed net of any time including LLINs. Of the 427 pregnant women who slept in the household the previous night 77.5% slept under a LLIN, while 80.9% (347) reported sleeping under any type of bed net including LLINs [7].

Amongst 456 households owning LLIN, 85.1% (388) had used at least one LLIN the night before the survey took place. Higher LLIN utilization was also evident among households whose wall was painted or plastered within the 12 months preceding the survey [8]. In total, 944 ITNs were supplied to the households included in this study. Of these, 649 (68.8%) were reported as being used by households [9].

Factors associated with the use of malaria prevention measures: Married women were 3 times more likely to use ITN than those not married. Women who had ever delivered babies were 2 times more likely to use ITN the previous night before the survey than nulliparous women [10, 11]. While a study conducted in Bahir Dar City in North West Ethiopia among People Living with HIV and AIDS (PLHA), 76.8% of PLHA utilized ITNs properly [12, 13].

The percentage of any person passing the previous night under a bed net from the total participating households and households conditional to bed net ownership was 12.0% and 62.2% respectively. About 40.3% of participating SAC in the households owned at least one bed nets and 7.8% of all participating SAC passed the previous night under a bed net irrespective of bed net ownership. The percentage of bed net utilization among SAC conditional to adequate access of bed net in their household was 66.7% [14].

In these years, households LLIN ownership increased from 3.4% to 53.3%; while use among children under-five years of age and pregnant women increased from 1.5% and 1.1% to 33.1% and 35.2%, respectively [15-17].

In 33.5% (630) of the households, at least one LLIN was used in previous night of the survey and 66.5% (1249) did not use. Of these, 62.2% (392) of the households hanged at least one of their LLIN above bed/sleeping place in the room. Of 9629 persons in the LLIN owned households, only 25.5% (2453) household members, including 46.6% (767) of children under five and 37.2% (54) pregnant women slept under LLIN. LLINs ownership and use were higher in malaria endemic zone (89.2%) and (55.1%) than fringe zone (60.1%) and (26.2%), respectively. Proportion of LLINs ownership was greater in households residing in a house with corrugated iron sheet roof (68.2%) than thatched roof houses (55.5%) [18].

Slightly over two thirds (67.5%) of children under-five years of age slept under a LLIN the night preceding the survey while only about half (51.3%) of other members of the household use LLIN. Overall, the utilization rate for all respondents was 58.5% [19].

Use of ITNs: 44% of pregnant women age 15-49 and 44% of children under age 5 slept under an ITN the night before the survey Nationally, 61% of de facto household members in The Gambia who stayed in the household the night before the survey could sleep inside an ITN if each ITN were used by up to two people. The results showed that 38% of the population slept under an ITN the night before the survey. Comparing these two indicators, it is evident that there is a large gap between access and ITN use of the population level. Overall, 55% of ITNs were used the night before the survey [2].

Despite the increase in net ownership, net utilization has declined amongst pregnant women (96.5% in 2012 and 94.4% in 2016), children under one (95.0% in 2012 and 94.4% in 2016 and the general population 89.1% in

2012 and 83.0% in 2016), (Saho 2016). Regionally, the gaps are even more significant. According to the 2016 BCC survey results, 78.3% of household members in the west coast region, 77.2% of household members in NBWR, 83.9% of household members in NBER, 87.7% of household members in LRR, 90.7% of household members in CRR and 75.8% of household members in URR were utilising LLINs to prevent malaria. It is evident that net utilisation is lowest in URR and this can have a negative consequence on the fight against malaria in the region.

Though the use of bed nets is cultural in the Gambia, there are factors that impedes their universal use, such as the shape (preferably conical), the small size that doesn't fit with large new fashion beds, the perception of hanging nets is old fashion, claustrophobic and heat increase perception (Gambia Government, 2009). ITN utilization is also influenced by factors such as age, education, size of household and ethnicity. Children are less likely to use ITNs especially those living in rural areas.

According to the 2016 BCC survey, there are increases in the supply of mosquito nets, especially of Long Lasting Insecticide Treated Nets amongst the Gambian population. In 2014, 96% of the population of the Gambia was reached through a mass bed net distribution campaign whilst in 2017, 88.5% of the population was reached with another campaign. Despite the high coverage of LLINs amongst the population, net utilization remains a challenge. The 2016 BCC survey further indicated that LLIN ownership in the communities have increased from 94.0% in 2012 to 99.6% in 2016 nationally. Despite the increase in net ownership, net utilization has declined amongst pregnant women (96.5% in 2012 and 94.4% in 2016), children under one (95.0% in 2012 and 94.4% in 2016 and the general population 89.1% in 2012 and 83.0% in 2016.

Regionally, the gaps are even more significant. According to the same report, (2016 BCC survey) 78.3% of household members in the west coast region including KM, 77.2% of household members in NBWR, 83.9% of household members in NBER, 87.7% of household members in LRR, 90.7% of household members in CRR and 75.8% of household members in URR were utilising LLINs to prevent malaria.

According to a study carried out in Enugu state, Nigeria [20] out of a total of 832 pregnant women studied, three hundred and fifty-nine (43.1%) women owned insecticide treated nets (ITNs), however 325 (90.5%) slept under the nets during the index pregnancies; equivalent to 39.1% utilization rate among the 832 women studied. Out of the 325 (39.1%) women that used ITNs; 236 (28.4%) used it singly, while 89 (10.7%) used it in combination with other anti-vector measures. Educational status and social class of the women had strong association with the use of ITNs. Women who used ITNs were significantly less likely to have acute malaria, anaemia and babies with low birth weight than women who did not use ITNs.

Similar studies carried out in western Nigeria [19] amongst 2560 households, it was found out that (68.6%) of the households had at least one under-five child living in the household while 32.6% had at least one pregnant woman living in the household. A total of 2440 (95.3%) households received LLIN during the campaign. Overall, the utilization rate for all respondents was 58.5%. Even though 2440 households received LLINs during the campaign, only 84.3% of them were seen to have hung theirs during the survey. Meanwhile, in Ghana, [21] out of a total of 355 pregnant women who were interviewed, ownership of LLIN was 81.4% while usage was 42.5%. Level of education significantly influenced LLIN ownership and utilization. The main barriers to LLIN utilization were inconvenience due to heat (77.7%), lack of ownership of LLIN (12.9%) and absence of mosquitoes (4.3%).

Knowledge on LLINs was high (73%). It is evident that ownership of LLIN was high but utilization was very low. Over a quarter (27%) of the pregnant women had moderate knowledge on LLINs. This if left unchecked can have negative consequences on the health of these women and their unborn babies.

Similar studies carried out in Ethiopia, [22], out of a total of 540 households intended to be included in the survey, 507 responded to the study (94.24% response rate), covering the homes of 2759 people. More than 58% of the households had family size >5 (the regional average), and 60.2% of them had at least one child below the age of 5 years. The ownership of at least one LLIN among households surveyed was 89.9%, and using at least one LLIN during the night prior to the survey among net owners was 85.1% (n = 456). Only 36.7% (186) mentioned at least as the mean of correct scores of all participants for 14 possible malaria symptoms and 32.7% (166) knew at least as the mean of correct scores of all participants for possible preventive methods. Over 30% of nets owned by the households were out of use. However, poor knowledge of the transmission mechanisms and the symptoms of malaria, and vector control measures to prevent malaria were evident. Moderate proportions of nets were found to be out of use or in poor repair.

In India where malaria is also still a major public health problem, a study carried out by Kamaraju Raghavendra et al 2017 [23], out of a total of 2970 households that were interviewed with a total of 15,003 individuals present in the households during the night before the survey, 98% of households had at least one LLIN and 59.4% of the surveyed population reportedly used an LLIN the previous night. LLIN use varied from 41 to 94% between the study clusters. Nearly 89% of the LLINs were found in good physical condition (without holes). However, proportion of household with at least one LLIN per two persons was only 39%. Relatively there is high net use despite poor access to LLINs and this indicates an overall desire to use nets when they are available. The main barrier to increased use of nets is the low coverage at household level.

In a study carried out in Mbarara on the perceptions about Malaria prevention [24], avoiding mosquitoes was the most common method mentioned for prevention of malaria. Other preventive strategies mentioned include boiling of drinking water, improved sanitation, clearing of bushes around the compound, avoiding cold weather, good nutrition, burning mosquito coils, screening of buildings, taking anti-malarials regularly and closing windows early. While most people in this study said LLINs were efficacious both in preventing mosquito bites and malaria, they expressed ignorance of insecticide treated nets and could not tell whether a bed net was treated or not. Barriers towards use of bed nets that would negate their use include; being expensive, being difficult to keep from holes, being inconvenient by increasing heat and sweating, causing suffocation and that it is impossible to buy a net for everybody in a big family. Some people said that they use bed nets when mosquitoes are plentiful but keep them when there are no mosquitoes in the dry season.

In a study carried out in Mbarara district, western Uganda, found that mosquitoes were perceived as a cause of malaria but at the same time use of bed nets was low (26 percent). People who did not use bed nets cited discomfort due to heat and humidity; and the high cost of LLINs as reasons for non-use [24].

Methods

Study Design and Sampling Process

Sampling Methodology

The research would be carried out in the URR south since 70% of the total population of the region resides in this area. This comprises four districts of which only two districts were selected randomly. The four districts in URR South namely Jimara, Fulladu East (Basse),

Tumanna and Kantora were written on pieces of paper and folded and placed in a box. A child was asked to select two pieces from the box and the districts of Fulladu East (Basse) and Jimara were the ones that came out hence the selected districts for the study. These two districts have a total population of 92563 people based on the 2013 population census.

A list of all the villages in the selected districts were obtained from the Gambia Bureau of Statistics 2013 census list and all of them written and folded in pieces of paper with the list of each district separated. Another child was asked to pick piece by piece. All the villages that appeared were recorded and regarded as the study villages. Upon arrival in the village, the head of the village is visited and informed of the data collection. After the introduction, a pen is tossed and the first compound in the direction in which the pen points to is visited. To select the next household, it was decided that the first digit of the serial number of a hundred-dalasi note would be used and that happens to be number 5. Thereafter, four households were counted in the same direction and every fifth household visited. In each village, ten respondents were interviewed. The data was entered, cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 25.

The qualitative data was analyzed using thematic network approach. The thematic analysis approach is recognized as the core method for analyzing qualitative data has been stated by Smith and Firth, 2011 [25]. It provides a flexible and very useful tool which helps to provide a rich and detailed account of analysis [25]. It is a useful approach in this research by capturing experiences of the participants regarding the issue been investigated.

Data Collection Tools

Structured Questionnaire

Data was collected using a pretested structured questionnaire and an FGD guide prepared in English. Field coordinators, public health officers and teachers who are resident in the region and are very fluent with the languages of the region (Fula, Mandinka and Sarahuleh) were engaged and recruited for the data collection. The data collected were oriented on the questionnaire for common understanding and interpretation of the questions before data collection started. The questionnaire included variables related to socio-demographic characteristics, net possession, net utilization, net preference, reasons for not using LLINs and indoor residual spraying. Pretest was carried out in communities that weren't part of the selected places and region of study. Necessary modifications were made thereafter. Each filled questionnaire was reviewed in the community just after the administration of the questionnaire to correct wrong responses with a view to assess appropriateness, comprehensiveness of the questions, any ambiguities and inaccuracies.

Focus group discussions was conducted for pregnant women, caregivers and household heads in the region to provide deeper understanding about net utilization and the factors that prevent net usage.

Limitations of the Study

One of the greatest limitations of the study was the overambition of the researcher in that the sample size was so large. Another major constraint was the lack of funding for the research which affected the study. The study was planned to be conducted in forty villages in the two districts covering a total of four hundred household heads but due to lack of funds to pay field workers to help in the data collection, the research was concentrated mostly around Basse (Mansajang, Basse Santo-su, Manneh Kunda, Kaaba Kama), Koba Kunda and Allunhareh. Only Gambissara, the largest and most populated village in Jimara district was visited. These villages account for 43.62% of the total population of the two districts (40376 of 92563 people). Of the four hundred households planned to be interviewed, only 73.25% (n=293) were successfully interviewed. Of this

total, 72.4% (n=212) were from the Basse district and 27.6% (n=81) were from Jimara district. Another limitation was that some of the respondents were not the actual household heads of the homes visited. This was clearly shown during the interview.

Reliability and Validity

Accuracy of the data collected using the research tools and techniques are essential. Reliability and validity are two important concepts that are of great value in determining the impact of results of a well-planned research and interpreting the findings of the study. To ensure reliability and validity during the study, the questionnaires and FGD guidelines were pre-tested among a group of household heads with the same characteristics with the study participants but outside the study area. The reason of pre-testing the interview guidelines was to assure that the language used and the way and manner the questions were asked were appropriate to the respondents. Reliability was also ensured by asking in-depth questions in addition to FGD and comparing that responses were the same during the interviews. For the research instrument to be reliable, the result of the study should be produced under a similar methodology (Golafshani, 2003). There was no problem with language throughout the study. Reliability is all about the extent to which results are consistent over time (reliability/repeatability) and an accurate representation of the total population under study (validity).

Results

Socio-demographic Characteristics of Household Heads that Participated in the Study

Table 1 shows the summary of the socio-demographic characteristics of respondents in the area in which the study was conducted. 89.42% (n=262) were males whilst 10.58% (n=31) were females. The mean age of the respondents is 39.98 years with standard deviation of ±10.91. When the mean age of male and female household heads/ respondents was compared using the independent sample t-test, there was a statistically significant difference level 0.05. Majority of the respondents were between the age group of 35-44 which accounted for 71.67% (n=210) followed by 25-34 age group which accounted for 14.68% (n=43), 45-54 years 9.9% (n=29) and finally 55 and above years 3.75% (n=11).

In terms of Ethnicity, the larger proportion of the respondents were Sarahuleh 47.90% (n=140), followed by fulas 42.01% (n=123), Mandinka's form 9.12% (n=27) and a very tiny proportion of the respondents 0.97% (n=3) belongs to other ethnic minorities. The number of respondents who claimed to be in one form of employment or another is as follows. Majority of the respondents 89.42% (n=262) were working whilst 10.58% (n=31) were not working.

In terms of education, 23.55% (n=69) of the respondents said that they have never gone through any western education but have studied the Quran, 36.86% (n=108) have completed primary education, 22.87% (n=67) completed secondary school education and 7.85% (n=23) said that they completed tertiary education. Eight-point eight seven percent 8.87% (n=26) are said to have gone through vocational training.

Of the 10.58% (n=31) female respondents, none has gone to school as they have been married since their early years. All the respondents, 100% (n=293) are all Muslims.

In terms of occupation, 58.36% (n=171) are involved in business, 15.70% (n=46) are farmers, 10.58% (n=31) are housewives and they don't consider that as an occupation. For them, an occupation is doing something for pay at the end of the month, 10.58% (n=31) are not employed whilst 4.78% (n=14) are civil servants.

In terms of income gained monthly, 95.22% (n=279) earn more than GMD6000 monthly (US$127).

In terms of marriage, all respondents n=293 were all married before. At the time of the survey, 71.33% (n=209) were still married, 26.62% (n=78) were in polygamous marriages and 2.05% (n=6) were women who are widowed.

Table 1. Socio-demographic Characteristics of Household Heads

Variables	Frequency (n)	Percent (%)
Sex of the respondents		
Male	262	89.42
Female	31	10.58
Age of respondents		
25 – 34	43	14.68
35 – 44	210	71.67
45 – 54	29	9.90
55 and above	11	3.75
Family size per household		
10+	95	32.42
11 – 20	111	37.88
21 – 30	63	21.50
31 – 40	18	6.14
40+	6	2.05
Attended school		
Yes	233	79.52
No	60	20.48
Ethnicity		
Sarahuleh	140	47.90
Fula	75	42.01
Mandinka	27	9.12
Others	3	0.97
Currently working		
Yes	262	89.42
No	31	10.58
Educational level		
Never attended school	69	23.55
Primary	108	36.86
Secondary	67	22.87
Tertiary	23	7.85
Vocational	26	8.87
Religion		
Muslim	293	100
Occupational status		
Not working	31	10.58
Business	171	58.36
House wife	31	10.58
Farmer	46	15.70
Civil Servant	14	4.78

Average monthly income		
Less than D2500	0	0
D2501 - D3500	0	0
D3501 - D4500	0	0
D4501 - D5500	14	5.34
More than D5500	248	94.66
Nationality		
Gambian	293	100
Marital status		
Married (monogamy)	209	71.33
Never married	0	0
Divorced/Separated	0	0
Married (polygamy)	78	26.62
Widowed	6	2.05

Magnitude of LLIN Ownership and Preference among Household

As shown in table two [2], 278 (94%) households representing 7021 people have nets at the time of the study. Only a small proportion, 15 (5.12%) households, representing 379 people didn't have nets during the time of the study. Most of these household heads produced vouchers they got from the last mass bed net distribution campaign but couldn't collect the net because the custodian of the vouchers has travelled at the time of distribution whilst others said that they have vouchers but couldn't produce them at the time of the interview. From the data obtained from the study, 86.35%, representing 6390 people prefer conical nets ("julu kilingo" translated as the one string net) whilst 9.56% representing 707 people prefer the rectangular. A very small proportion 4.10% don't have any preference. It was also observed that building design was a factor in net preference as most of the house structures would find it difficult to hang a rectangular net.

Regarding texture preference, 90.78% of respondents prefer a soft net by texture whilst 5.12% prefer a hard net. A very small proportion of respondents, 4.10% don't have any texture preference. Another determinant in net preference is the mesh size. Through discussions, a lot of the respondents said that the holes on the net are large. This was also revealed by the mass LLIN campaign evaluation survey conducted by CIAM.

The study revealed that utilization rate was 79.14% (n=220) households whilst 20.86% (n=58) of the households weren't using LLINs at the time of the study. Of the 58 households, 25.86% (n=15) were households without LLINs. According to the post evaluation report of the mass LLIN campaign report conducted by CIAM, "Reasons reported by respondents (n=245) for not using the bed nets include the shape of the nets 32.81% and the size of the nets 24.69%". this would account for 57.5% not utilizing the nets. This is a real cause for concern. The CIAM report also revealed that 9.05% of the nets supplied during the campaign to households were not seen and don't know what happen to them. These are probably the nets found hanged at the community and household gardens.

According to the 2016 BCC survey report, 84.9% of the population prefer soft texture whilst 78% expressed that they prefer a conical net. Preference for conical nets is an important determinant for utilization but it's not exclusively the most important determinant for utilization. The 2016 BCC survey revealed that

household heads were also asked whether they would use the net if issued a net of a texture different from their choices. Apparently, the texture of a mosquito does not significantly determine whether the net would be used by household heads with more than 90.0 % of household heads across regions indicating that if issued with a net with a texture different from their choice they would use it. The observed proportion of household heads who would use nets if issued with nets different from their choices ranges from 91.2 % in WR to 100.0 % in URR.

Table 2. Magnitude of LLIN Ownership and Preference among the Respondents

Variables	Frequency (n)	Percent (%)
Mosquito nets in household		
Yes	278	94.88
No	15	5.12
Net preference by type/shape		
Conical/round	253	86.35
Rectangular	28	9.55
Any of the two	12	4.10
Net preference by texture		
Soft	266	90.78
Hard	15	5.12
Any of the two	12	4.10
Sleeping under net without preference		
Yes	220	79.14
No	58	20.86
Using net when sitting outside		
Yes	81	27.65
No	212	72.35
Source of mosquito net		
Mass campaign	212	76.26
Govt. Health Facilities/Posts	34	12.23
Mobile/Outreach clinic	30	10.79
Friends/Relative/Neighbors	2	0.72
Slept under an LLIN the night Before		
Yes	199	71.58
No	79	28.42
Utilization amongst Ethnic groups		
Sarahuleh	102	72.90
Fula	63	84.0

Utilization of LLINs and Incidence of Malaria among Households

The findings of the present study provide an important account on the utilization of LLIN and the relationship between utilization and malaria episodes in the study population. The study revealed that 71.58% (n=199) of the household heads and their families used bed

nets when sleeping a night before the study as shown in Table 3. A total of 11 household heads, accounting for 5.53% reported malaria episodes in their households.

Of the households that reported malaria episodes during the year, 90.91% didn't sleep under bed nets. This clearly shows that bed nets play a very significant role in the prevention of malaria.

Majority of the respondents, 96.25% believed that bed nets can help in reducing the incidence of malaria in the region. Only 3.75%) of respondents believed that other interventions can reduce the incidence of malaria in the region. Among these interventions mentioned are IRS and SMC for children under five years.

Table 3. Utilization of LLINs and Cases of Malaria among the Households

Variables	Frequency (n)	Percent (%)
Current use of treated bed net		
Yes	199	71.58
No	79	28.42
Malaria episode this season		
Yes	11	5.53
No	43	54.43
Slept under bed net before contracting diseases (n=11)		
Yes	1	9.09
No	10	90.91
Outcome of malaria episodes		
Treated and Discharged	11	100
Died	0	0
Bed net can reduce the incidence of malaria		
Yes	282	96.25
No	0	0
Other intervention	11	3.75

Qualitative Analysis

The focus group discussion revealed interesting findings regarding the use of LLINs amongst members of the households. Two FGDs were held, one in Basse and One in Gambissara and each FGD brought together heads of households, caregivers, pregnant women and health workers. The method used for the analysis of the FGD data was based on thematic areas. After a thorough analysis, the researcher came up with seven (7) thematic areas namely: 1) Knowledge of participants on LLIN; 2) benefits of LLINs; 3) sources of LLINs within the community; 4) reasons for low utilization of ITNs; 5) how to improve net utilization amongst households; 7) indoor residual spraying (IRS).

Knowledge of Participants on LLINs

The discussions revealed that the level of knowledge regarding the use of LLINs was very high among respondents because the majority of the respondents could give an in-depth description of LLINs. Female respondents gave clearer responses to questions which indicates that females have more understanding regarding LLINs. This could be possible since women visit clinics more often where IEC/ BCC is conducted on a regular basis, they are also seen in larger numbers

during LLIN campaigns at distribution sites. Some of the responses are as below:

"It is a net that kills mosquitoes. They are very good. I like sleeping under them but most of my sons don't want to sleep under them. They should, especially in the rainy season when mosquitoes are many",

"Previously we are supplied two types of treated nets, conical and the other one is rectangular, they are supplied at health facilities to pregnant women and women with babies, all the villages are usually supplied through campaigns every three years.

Benefits of LLINs

Responding to questions on the benefits of LLINs to the households, discussions on both sites (Basse and Gambissara), reveals that members had different opinions about the benefits on the use of LLINs. Whilst some respondents have a clear understanding of the benefits and purpose of LLINs, especially the women, a few men only nodded their heads in agreement with what the women were saying. The comment from the FGDs interviews revealed that LLINs have numerous benefits. One respondent nearly moved everyone to tears when he said,

"Bed nets have really averted a lot of troubles within our families and communities". "Few years ago, when malaria and other diseases like measles were so many in our communities, it was really very difficult for some of our very old women who were often accused of witchcraft".

"It went to the extent that old women cannot visit children who are sick and either at home or admitted in hospitals".

"I also remembered that year when there was an outbreak of measles in our circumcision camp that killed two children, old women names were mentioned and attacked as witches".

'All this has now changed because people are now more aware and malaria has also drastically reduced. People now know the causes and consequences of malaria he concluded".

Other responses are here transcribed:

"They prevent one from catching malaria. When you sleep under an LLIN, you don't get bitten by mosquitoes and therefore will never have malaria".

"LLINs prevents one from expenditure on malaria says another respondent. When you are sick, you pay money for treatment and when you are well you don't spend money".

"LLINs makes one to sleep and rest well at night because I am not disturbed by mosquitoes especially when I close from work and I am very tired. You know we are farmers and we need good rest at night".

Another comment that made me emotional was when one elderly man of Gambissara said

"In my home I have a Dara with more than one hundred talibehs, we do farming to supplement feeding. Few years ago, when the rainy seasons starts, my talibehs would be queuing at the health center like no other, work is affected in my farms to the extent that I must pay for labor. But since I started having adequate nets for everyone and benefited from the spraying done by you people, I and my talibehs have taken a break from the health center and we no longer pay for labor. Its only God who can pay you people".

Another man also said,

"This is the only exam that the government has passed in the health sector".

Sources of LLIN within the Community

There was consensus that the LLINs in the communities were free of charge and that and all pregnant women and women with babies can get a net for free when they visit the clinics. Another respondent said that the mass LLIN campaign was another source and all the respondents agreed. All the respondents said they benefited from the last campaign.

Reasons for low utilization of LLINs

Despite the high level of ownership of LLINs amongst the communities, there has been a concern for the low utilization in the region. The major factors highlighted as barriers to utilization were texture (too hard), shape (majority preference for conical), and majority of the man who responded said that they are mainly meant for pregnant women and children. Some respondents also mentioned that the holes of the net are large and that it makes no difference when you sleep inside the net as mosquitoes will still gain access to you. However, a major barrier to utilization is mosquito populations and indoor residual spraying. Generally, it was agreed that the last IRS was very effective and the chemical that was used was very good. It kills mosquitoes as well has a repellant effect. The issue of heat as well as causing irritation especially amongst children were raised.

"You see, this spraying done last year was good. For a month after the spraying, I never heard a mosquito wine in my house" the chemical is very good and I hope you people continue to use it next time as well. When we spray our houses with that chemical, there were no mosquitoes for a very long period.

Another respondent said,

"The previous chemical used was either not good or they add too much water to it. It doesn't even smell like a chemical and it invites mosquitoes especially on the day the spraying was done". The spray men leave your house dirty and with a lot more mosquitoes".

"I think the essence of sleeping under LLINs is to prevent mosquito bites, well if spraying is done, all the mosquitoes die or run away, in that case, I prefer to sleep without a net because using a net adds to the heat already present inside the house."

From the above responses, it's very clear that IRS is a very important component in the fight against malaria yet still a barrier for the utilization of LLINs amongst communities it is conducted.

How to improve the utilization of LLINs amongst household members

Household heads can play a very important role in the improvement of LLIN utilization in their respective households and communities. As one household head puts it

"This is all geared towards our own and our family's benefits". Henceforth, "I will ensure that everyone in the family continue to sleep under a net regularly.

Another household member said,

'Please try and get us the "julu kilingo" meaning the net with one string (conical). In as much as I want to tie a net in my house, the type of house and bed I have, it's difficult to tie the four-cornered net'.

It is therefore important for the national malaria program to look in more detail into people's preferences regarding the use of LLINs and embark on intensive sensitization across all communities.

Discussion

In this study I examined the determinants of ownership and utilization of treated bed nets among households in two districts of upper river region, Fulladu East (Basse) and Jimara. I also assessed the factors responsible for the low utilization of LLINs amongst households. The study revealed that knowledge that sleeping under bed nets prevents malaria transmission and belief that bed nets prevent malaria were important predictors positively associated with LLIN utilization. The presence of hanging nets was the strongest predictor of high LLIN utilization among net owning households in this study. These finding agreed with those from a study in Port Harcourt Nigeria by C. I Tobin-West et al [11] as well as a study done in Ethiopia by Sena et al [17].

Socio-demographic factor that was statistically significant was found to be ethnicity. Ethnicity is linked to culture. It was

found that the ethnicity with the lowest utilization rate in the study were the Sarahuleh. This fact can also be interpreted in other ways. In terms of absolute numbers in the study population, they form the majority but in terms of utilization in percentage terms, they are the lowest. The researcher can link cultures such as; regarding malaria as caused by other spiritual factors as well as other myths may hinder people from using bed nets. Education level, family size, marriage status, economic status was not found to be statistically associated with bed nets utilization.

The study further reveals that whilst ownership of LLINs was high amongst respondents, utilization was relatively low at 71.58%. Similar studies carried out in in Ethiopia by Yibeltal Berie et al [12] found that utilization rate of LLINs was 76.8%, whilst other studies in Kenya revealed utilization rate of 76.9% [13]. According to the World Health Organization (WHO) annual report of 2017, in 2016 in sub Saharan Africa, 54% of the population at risk slept under an LLIN, increasing from 30% in 2010.

According to the same report, household ownership of at least one LLIN was high (80%) in 2016, rising from 50% in 2010. This result suggests that the channels NMCPs use for delivery of LLINs can reach most households; hence, individual access to LLINs increased from 34% in 2010 to 61% in 2016.

The proportion of households with sufficient nets, however, was only 43% in 2016, up from 19% in 2010 but still substantially lower than the universal coverage targets. This relatively low level in the adequacy of available nets explains, in part, the relatively low use rates in most African countries.

Furthermore, the study revealed that 72.35% don't use bed nets outsides their sleeping spaces. This is very significant because household members will encounter infective mosquitoes especially during hot weather conditions. From the data, 90.91% of those that don't use nets ether outside or inside the sleeping places reported having malaria episodes whilst only 5.53% of those that reportedly use LLINs experienced malaria episodes. This is a very clear indication that bed nets can prevent malaria.

Conclusion

Despite free distribution of LLINs during mass campaigns and routine distribution through government health facilities, the ownership was found to be high but utilization remains low and a challenge. Therefore, there is a need to refocus on people's choice of bed nets including the textural properties to increase the utilization of LLINs to effectively and efficiently control malaria in The Gambia. Government should consider the bed nets choices of individuals as in conical and soft texture and should therefore increase the quantities of these types of LLINs when procurement of LLINs is done.

In addition, IRS should be strengthened and conducted regularly as there is evidence that IRS can be a barrier for the utilization to LLINs. SBCC activities should also be strengthened within communities throughout regions where IRS is conducted.

Finally, further research needs to be conducted to properly and fully understand the phenomenon of low utilization of LLINs in our communities.

Recommendations

1. For the Gambia to remain on course to eliminate malaria as a disease, it is very crucial for Government and its malaria partners to focus on the following as indicated by several surveys conducted in this country.
2. Focus on buying the choices of nets for the intended beneficiaries in terms of both texture and shape.
3. Ensure that IRS is regularly and consistently done in the regions and scaled up countrywide.

4. Strengthen and intensify SBCC activities to sensitize communities that IRS is not a replacement of LLINs.
5. National Malaria Control Program and its implementing partners should carry out a more detailed study to better understand the issue of low net utilization in our communities and this can greatly hinder the goal of malaria elimination.

Conflict of Interest

I do declare that there is no conflict of interest.

Ethical Consideration

This research has no adverse potential risks to participants and myself as it did not involve any sensitive issues that will violate the norms and values of these communities involved in the study. It did not also involve any other forms of invasive procedures. During data collection, written informed consent was sought to administer the questionnaires. Each study participant was given information about the study before administering the questionnaire. Assurance of anonymity was observed at all stages. The participants were also informed that they are free to drop out from the study at any time they feel to and that the results obtained will be shared with them through their various community health nurses and public health officers at RCH clinics. Where possible, the results will be shared with the various village development committees of the villages that participated in the research. To ensure confidentiality, no names of household members or household heads would be written on any of the questionnaires used during the data collection. Questionnaires were only identified using unique serial numbering.

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Reference

[1]. Organization Who,. High burden to high impact: a targeted malaria response. *World Health Organization*; 2018.

[2]. GBoS, G. B., of S, ICF. The Gambia Demographic and Health Survey 2019-20. 2021 Mar 15 [cited 2023 Mar 6]; Available from: https://dhsprogram.com/publications/publication-FR369-DHS-Final-Reports.cfm

[3]. Pryce, J., Richardson, M., Lengeler, C., 2018, Insecticide-treated nets for preventing malaria. *Cochrane Database Syst Rev.* Nov 6;2018[11]:CD000363.

[4]. Geneva WHO, World Malaria Report 2016. *World Health Organization.* 2017

[5]. Organization WH. 2015, Global Technical Strategy for Malaria 2016-2030. *World Health Organization*, 35 p.

[6]. Sangaré, L. R., Weiss, N. S., Brentlinger, P. E., Richardson, B. A., Staedke, S. G., Kiwuwa, M. S., et al., 2012, Determinants of use of insecticide treated nets for the prevention of malaria in pregnancy: Jinja, Uganda. *PLoS One.* 7[6]:e39712.

[7]. Lindblade, K. A., Dotson, E., Hawley, W. A., Bayoh, N., Williamson, J., Mount, D., et al., 2005, Evaluation of long-lasting insecticidal nets after 2 years of household use. *Tropical Medicine & International Health.* 10[11]:1141–50.

[8]. Konlan, K. D., Kossi Vivor, N., Gegefe, I., Hayford, L., 2022, Factors associated with ownership and utilization of insecticide treated nets among children under five years in sub-Saharan Africa. *BMC Public Health.* 22[1]:1–11.

[9]. Dagne, G., Deressa, W., 2008, Knowledge and utilization of insecticide treated mosquito nets among freely supplied households in Wonago Woreda, Souther Ethiopia. *Ethiopian journal of health development.* 22[1]:34–41.

[10]. Kanu, N. E., Ajumobi, O., Ajayi, I. O., Nguku, P., Tobin-West, C., Factors influencing the Use of Malaria Prevention Methods Among Women of

Reproductive Age in Peri-urban Communities of Port Harcourt City, *Nigeria*.

[11]. Tobin-West, C. I., Kanu, E. N., 2016, Factors influencing the use of malaria prevention methods among women of reproductive age in peri-urban communities of Port harcourt city, Nigeria. *Nigerian Postgraduate Medical Journal*. 23[1]:6.

[12]. Berie, Y., Alemu, K., Belay, A., Gizaw, Z., 2013, Factors affecting utilization of Insecticide treated nets among people living with HIV/AIDs in Bahir Dar city, northwest Ethiopia.

[13]. Nnedu, O. N., John-Stewart, G. C., Singa, B. O., Piper, B., Otieno, P. A., Guidry, A., et al., 2012, Prevalence and correlates of insecticide-treated bednet use among HIV-1-infected adults in Kenya. *AIDS care*. 24[12]:1559–64.

[14]. Zerdo, Z., Bastiaens, H., Anthierens, S., Massebo, F., Masne, M., Biresaw, G., et al., 2020, Long-lasting insecticide-treated bed net ownership, utilization and associated factors among school-age children in Dara Mallo and Uba Debretsehay districts, Southern Ethiopia. *Malaria Journal*. 19:1–13.

[15]. Macro, O. R. C., 2006, Central Statistical Agency Addis Ababa, Ethiopia. Central Statistical Agency Addis Ababa, *Ethiopia*.

[16]. Ababa, A., 2003, Federal democratic republic of Ethiopia ministry of health. *Ethiopia: Postnatal Care*.

[17]. Sena, L. D., Deressa, W. A., Ali, A. A., 2013, Predictors of long-lasting insecticide-treated bed net ownership and utilization: evidence from community-based cross-sectional comparative study, Southwest Ethiopia. *Malaria Journal*. Nov 9;12[1]:406.

[18]. Gobena, T., Berhane, Y., Worku, A., 2012, Low long-lasting insecticide nets (LLINs) use among household members for protection against mosquito bite in kersa, Eastern Ethiopia. *BMC public health*. 12:1–9.

[19]. Aderibigbe, S. A., Olatona, F. A., Sogunro, O., Alawode, G., Babatunde, O. A., Onipe. A. I., et al., 2014, Ownership and utilisation of long lasting insecticide treated nets following free distribution campaign in South West Nigeria. *The Pan African medical journal*. 17.

[20]. Utilization of insecticide treated nets among pregnant women in Enugu, South Eastern Nigeria | *Nigerian Journal of Clinical Practice* [Internet]. [cited 2023 Mar 7]. Available from: https://www.ajol.info/index.php/njcp/article/view/93964

[21]. Axame, W. K., Kweku, M., Amelor, S., Kye-Duodu, G., Agboli, E., Agbemafle, I., et al., 2016, Ownership and Utilization of Long-Lasting Insecticide Treated Nets (LLIN) and Factors Associated to Non-utilization Among Pregnant Women in Ho Municipality of Ghana. *Central African Journal of Public Health*. 2[1]:35–42.

[22]. Tassew, A., Hopkins, R., Deressa, W., 2017, Factors influencing the ownership and utilization of long-lasting insecticidal nets for malaria prevention in Ethiopia. *Malaria journal*. 16[1]:1–9.

[23]. Raghavendra, K., Chourasia, M. K., Swain, D. K., Bhatt, R. M., Uragayala, S., Dutta, G. D. P., et al., 2017, Monitoring of long-lasting insecticidal nets (LLINs) coverage versus utilization: a community-based survey in malaria endemic villages of Central India. *Malaria Journal*. 2017;16[1]:1–8.

[24]. Nuwaha, F., 2002, People's perception of malaria in Mbarara, Uganda. *Tropical Medicine & International Health*. 7[5]:462–70.

[25]. Smith, J., Firth, J., 2011, Qualitative data analysis: the framework approach. *Nurse Researcher*. 18[2].

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Investigating the Public Health Behavior Related to Street Food Consumption among Lubyayi Residents: Cross-Sectional Study

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Abstract

*Street food consumption is a major public health and social problem confronting urban Residents. S*trong public health *and social behavior* need to be integrated at all community educational levels. *The objective of this cross-sectional study is to investigate the public health behavior of street food consumption and identify factors associated with safe food consumption practices. The study provides insight into the perceptions, experiences, and adaptation strategies to Street Food Consumption. A cross-sectional survey of 160 street food Consumers reveals significant awareness of the public health behavior of street food consumption, and factors associated with safe food consumption. The results show an equal gender distribution, with the majority of respondents falling between 25-34 years old, at 31%. Most respondents have a primary or secondary education, at 38%, and Half have a low-income level, at 50%. Most respondents consume street food weekly, 50%. The majority have inadequate food safety knowledge, 63%. 75% have experienced foodborne illnesses. And most of the respondents do not practice proper food handling practices, 63%. The food Taste is the most important factor, 63%. Half of the respondents consider price very important, 50%. Only 38% of respondents prioritize safety. Most respondents do not trust street food vendors, 63%. Most of the respondents do not perceive the street food environment as clean, 63%. Improper waste management is prevalent in 66%. And Most respondents do not have access to clean water, 59%. The findings of this study contribute to the existing body of knowledge on the public health behavior of street food Consumption.*

Keywords*: Public, Health, Behavior, Street, Food, Consumption.*

Introduction

Street food consumption is a widespread practice globally, particularly in urban environments where it provides an affordable and convenient food option for many consumers [1, 3]. Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health. Unsafe food containing harmful bacteria, viruses, parasites, or chemical substances causes more than 200 diseases, ranging from diarrhea to cancers [2]. However, it poses significant public health risks due to food safety concerns [2, 4]. According to the World Health Organization (WHO), foodborne illnesses are a major public health problem worldwide, with street food being a significant contributor to these illnesses [8]. Studies in various countries, including China, Egypt, and others, have highlighted the importance and necessity of addressing food safety risks in street food vending [28-30]. For instance, research in China has shown that food safety risks and control strategies for street food are very critical to preventing foodborne illnesses [28, 30], while studies in Egypt have emphasized the need for improved food safety knowledge and practices among street food vendors [29]. Studies conducted in some African countries, such as Nigeria and Morocco, have shown that the major street food

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vendors usually earn more than the country's minimum wage. In Nigeria, it is often cheaper to buy street food than to cook it at home [23]. Street foods also serve as a major source of nutrients for many adolescents [23]. Street food vending makes up a significant proportion of the informal sector of the economy of most developing countries [22]. The street food sector in urban areas lacks regulation, posing health risks to consumers [5, 6]. Key issues include food safety risks due to poor handling practices [4, 7], environmental concerns related to the availability of non-biodegradable packaging [14], and limited access to secure and clean water for food preparation and consumption [9, 24]. For example, studies in Ghana and Uganda found that street food vendors often lack knowledge about proper food handling practices and operate in unsanitary conditions, which can lead to food contamination and foodborne illnesses [10, 12, 22, 27]. Some existing solutions to address these problems include implementing food safety regulations [11, 16], promoting safe food handling practices among vendors [13, 15], and encouraging the use of biodegradable packaging materials [20]. Food safety training programs for street food vendors have been shown to improve their knowledge and practices in various countries, including South Africa and Cambodia [14, 15]. A comprehensive approach that combines regulatory measures, education, and infrastructure improvements is likely the best solution [21, 25]. This approach can include training programs for street food vendors, improved waste management systems, and increased access to clean water and sanitation facilities [26]. By addressing the main root causes of food safety risks, such an approach can help reduce the incidence of foodborne illnesses associated with street food consumption. This study may be limited by the sample size and representation of street food vendors, as well as the potential for biases in self-reported data [17, 18]. Additionally, the effectiveness of food safety interventions may vary depending on the local context and cultural factors [19]. By implementing a comprehensive approach to address food safety risks in the street food sector, it is possible to achieve significant improvements in public health outcomes. Studies have shown that food safety training programs can lead to improved knowledge and practices among street food vendors, resulting in reduced risks of foodborne illnesses [14, 15]. Furthermore, increased access to clean water and sanitation facilities can help prevent contamination of food and reduce the risk of foodborne illnesses [9, 24]. By combining these interventions, it is possible to create a safer and healthier street food environment for all consumers.

Objectives

The objective of this cross-sectional study is to investigate the public health behavior of street food consumption and identify factors associated with safe food consumption practices.

To provide a thorough examination of the effects of public health behavior of street food consumption in city communities, focusing on Food Safety and proper food handling practices.

The Novel Contributions of the study are to provide quantitative evidence of the public health behavior of street food consumption and identify factors associated with safe food consumption practices. The study contributes to the limited body of knowledge on public health behavior of street food consumption in the Lubyayi city community, providing valuable insights for policymakers and practitioners.

The study's findings provide valuable insights for policymakers and practitioners seeking to support public health behaviors related to street food consumption in urban communities, specifically in Lubyayi city communities.

Materials and Methods

1. **Description of the Site**

Lubyayi is located in Kabongo Rural Health Zone (ZS), territory of Kabongo, Haut-Lomami province in the Democratic Republic of Congo. The Population of Lubyayi city is about 20799, served by 5 universities, 3 markets, and 1 general reference hospital. The population is made up of several ethnic groups, with various customs and dialects. It is mainly made up of the Baluba. Although there are different dialects, Swahili is the most widely spoken and heard national language. The climate is tropical with two alternating seasons: a dry season from mid-April to mid-August, and a rainy season from mid-August to mid-April. The majority of the population lives from agriculture, the main activity, but the population also lives thanks to the small livestock, small trade, hunting, artisanal fishing, and some seasonal activities (mushroom picking and the collection of caterpillars and winged ants, etc). The community is accessible by road and rail at about 12 km. Road accessibility is challenging during the rainy season, which consequently affects the population's income. And food becomes scarce as a result of the preparatory work of the fields, the abundant rains, and the sowing, which makes the markets more unstable and already causes an increase in the price of this food product, which is the staple food. Households have less access to this food and become more food insecure [31].

2. **Description of the Experiment**

A cross-sectional study design is designed to capture detailed information on the public health behavior of street food consumption, with a sample size of 160 respondents in the Lubyayi city community.

3. **Description of statistical methods**

The Study Population

A Descriptive statistic for categorical variables was carried out in the Lubyayi city of the Kabongo Health Zone Community, where the questionnaire was conducted following the target population for the study.

4. **Sampling Method**

The probability sampling approach in this study is recommended and used to ensure representativeness and reduce bias. The Random sampling method was used to select the 160 respondents for the study, and every respondent had an equal chance of being selected from a complete list of respondents.

5. **Data Collection**

A validated and standardized questionnaire was used for data gathering, and interview was conducted by the researcher and five interviewers to collect information on hardcopy and smartphones. The Types of Interviews were structured to enable the interviewers to ask each respondent the same questions in the same manner. All questions were set in advance, along with the possible answers. The interviewers adhered closely to the interview instructions, and the responses were noted or written down. Only interview those participants who fit the sampling criteria, in such a way that a limited range of responses is elicited.

6. **Data Analysis**

To analyze the data from the 160 samples, we used the frequency counts from our questionnaire and calculated the percentages, using Excel, which was carried out in tables and figures. The Frequency counts report the number of occurrences of each category or response in our data collection. Percentages convert these frequencies into proportions of the total sample, making it easier to interpret and compare. Tables and figures in this study complement each other by drawing attention to different features of the data collected.

Results

The results of the present study are presented in percentages from the frequency in the tables, and the table results are represented below in the charts. Out of 160 respondents who participated actively in the study questionnaire, here are the observations and findings collected from tables one to five.

Table 1 and Figure 1 enumerate the demographic information of the sample for the present research, by Sex, Age, level of education, and the level of respondents' Income. Males accounted for 80 (50 %), females 80 (50%), 18-24 years 40 (25%), 25-34 years 50 (31%), 35-44 years 30 (19%), 45-54 years 20 (13%), 55+ years 20 (13%). Education Level: Primary 60 (38%), Secondary 60 (38%), Tertiary 40 (25%), Low Income Level 80 (50%), Middle Income Level 60 (38%), and High-Income Level 20 (13%).

Table 2 and Figure 2 list the respondents' Frequency of Food Consumption Practices and Food Safety Knowledge: Daily food consumption accounted for 60 (38%), Weekly 80 (50%), Monthly 20 (13%), Adequate Food Safety Knowledge 60 (38%), and Inadequate Food Safety Knowledge 100 (63%).

Table 3 and Figure 3 list the Food Safety Risks and the Food Handling Practice: respondents experienced Foodborne Illnesses accounted for 120 (75%), not experienced Foodborne Illnesses 40 (25%), practiced Proper Food Handling Practices 60 (38%), and not practiced proper Food Handling Practices 100 (63%).

Table 4 and figure 4 lists Factors considered by respondents when Purchasing Street Food: Taste Purchasing Decisions account for 100 (63%), Price Purchasing Decisions 80 (50%), Safety Purchasing Decisions 60 (38%) and Consumer Trusting the street food 60 (38%) and Consumer not Trusting Street Food 100 (63%).

Table 5 and figure 5 lists the Environmental Factors about the Street Food Consumption: Clean environment of the Street Food Consumption account for 60 (38%), No Clean environment of the Street Food Consumption 100 (63%), Proper Waste Management 55 (34%), Improper Waste Management 105 (66%), Access to Clean Water 65 (41%), No Access to Clean Water 95 (59%).

Discussion

Out of 160 respondents of the study, the discussion has been conducted according to the objectives of the study and the study results. The objective of this cross-sectional study is to investigate the public health behavior of street food consumption and identify factors associated with safe food consumption practices.

The Interpretation of the results is as follows:

Table 1 and Figure 1 list the Demographic Information: there is an equal gender distribution: Males (50%) and females (50%) are equally represented. For the respondent's Age distribution, the majority of respondents are between 25-34 years (31%). For the level of Education, most respondents have primary (38%) or secondary education (38%), and Half of the respondents have a low-income level (50%).

Out of 160 participants, these are the observations and findings of the study represented in tables and figures.

Table 1 enumerates the demographic information of the sample for the present research, by Sex, Age, level of education, and the level of respondents' Income. Males accounted for 80 (50 %), females 80 (50%), 18-24 years 40 (25%), 25-34 years 50 (31%), 35-44 years 30 (19%), 45-54 years 20 (13%), 55+ years 20 (13%). Education Level: Primary 60 (38%), Secondary 60 (38%), Tertiary 40 (25%), Low Income Level 80 (50%), Middle Income Level 60 (38%), and High-Income Level 20 (13%).

Table 1. Demographic Characteristics of Street Food Consumers

Variables	Characteristic	Frequency	Percentage (%)
Sex	Male	80/160	50%
	Female	80/160	50%
Age	18-24	40/160	25%

	25-34	50/160	31%
	35-44	30/160	19%
	45-54	20/160	13%
	55+	20/160	13%
Education	Primary Education	60/160	38%
	Secondary Education	60/160	38%
	Tertiary Education	40/160	25%
Income	Low Income Level	80/160	50%
	Middle Income Level	60/160	38%
	High Income Level	20/160	13%

Note: *demographic characteristics: gender, age range, education, and income level. -Frequencies represent the number of respondents in each category. - Percentages are calculated from the total sample size (N=160).*

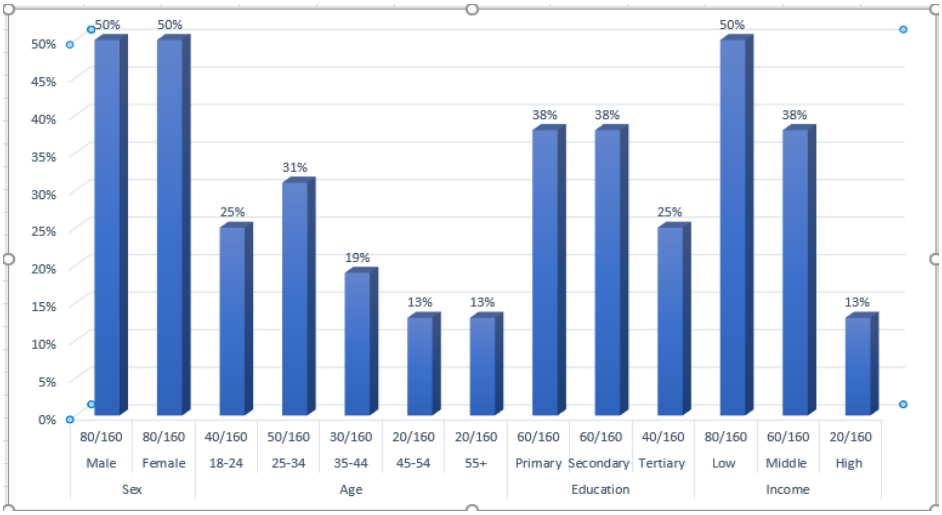

Figure 1. Demographic Characteristics of Street Food Consumers

Note: *study sample (N = 160). - distribution of respondents by sex, age group, education level, and income level. Males and females each accounted for 80 respondents (50%). Age groups included 18-24 years (25%), 25-34 years (31%), 35-44 years (19%), 45-54 years (13%), and 55+ years (13%). Education levels were primary (38%), secondary (38%), and tertiary (25%). Income levels were low (50%), middle (38%), and high (13%).*

Table 2 and Figure 2 enumerate Food Consumption Practices and Food Safety Knowledge: for the Frequency of food consumption, it is observed that Most respondents consume street food weekly (50%). For Food safety knowledge, the majority of respondents or consumers have inadequate food safety knowledge (63%).

Table 2 lists the respondents' Frequency of Food Consumption Practices and Food Safety Knowledge: Daily food consumption accounted for 60 (38%), Weekly 80 (50%), Monthly 20 (13%), Adequate Food Safety Knowledge 60 (38%), and Inadequate Food Safety Knowledge 100 (63%).

Table 2. Food Consumption Practices

Variables	**Characteristic**	**Frequency**	**Percentage** (%)
Time	Daily	60/160	38%
	Weekly	80/160	50%
	Monthly	20/160	13%

Safety	Adequate Safety Knowledge	60/160	38%
	Inadequate Safety Knowledge	100/160	63%

Note: *Frequencies represent the number of respondents in each category. -Percentages are calculated from the total sample size (N=160). - Categories under Food consumption practices: dietary intake & safety knowledge.*

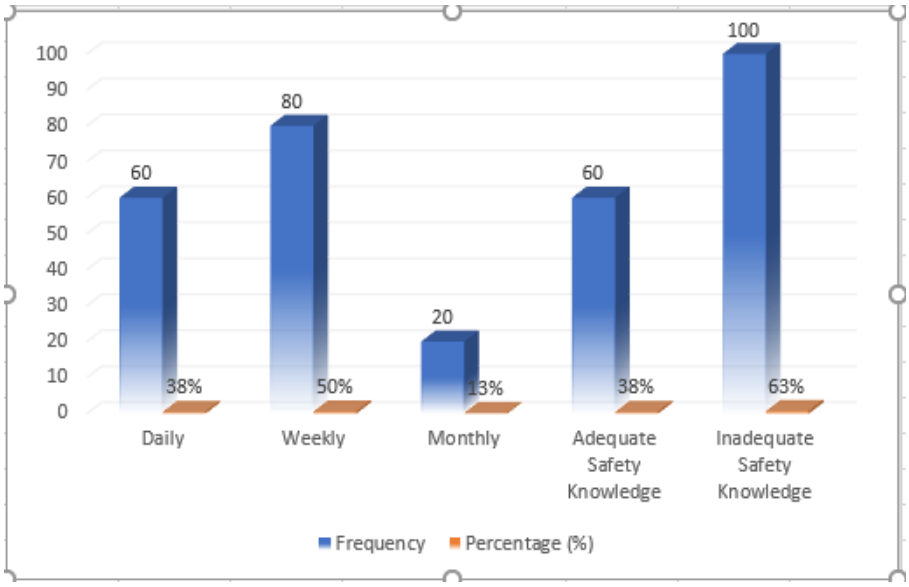

Figure 2. Food Consumption Practice

Note: *illustrates the frequency of food consumption and levels of food safety knowledge among respondents (N = 160). Daily consumption accounted for 60 respondents (38%), weekly consumption for 80 respondents (50%), and monthly consumption for 20 respondents (13%). -Regarding food safety knowledge, 60 respondents (38%) demonstrated adequate knowledge, while 100 respondents (63%) had inadequate knowledge.*

Table 3 and Figure 3 list Food Safety Risks and Food Handling Practices: for the Foodborne illnesses, 75% of respondents have experienced foodborne illnesses. And for the Food handling practices, most of the respondents do not practice proper food handling practices, with 63%.

Table 3 lists the Food Safety Risks and the Food Handling Practice: respondents experienced Foodborne Illnesses accounted for 40 (25%), did not experience Foodborne Illnesses 120 (75%), practiced Proper Food Handling Practices 60 (38%), did not practice proper Food Handling Practices 100 (63%).

Table 3. Food Safety Risks

Variables	**Characteristic**	**Frequency**	**Percentage (%)**
Foodborne Illnesses	Foodborne Illnesses (Yes)	120/160	75%
	Foodborne Illnesses (No)	40/160	25%
Food Handling Practices	Proper Food Handling Practices	60/160	38%
	Improper Food Handling Practices	100/160	63%

Note: *Frequencies represent the number of respondents in each category. - Percentages are calculated from the total sample size (N=160). - Categories under Food safety Risks: sickness & manipulation.*

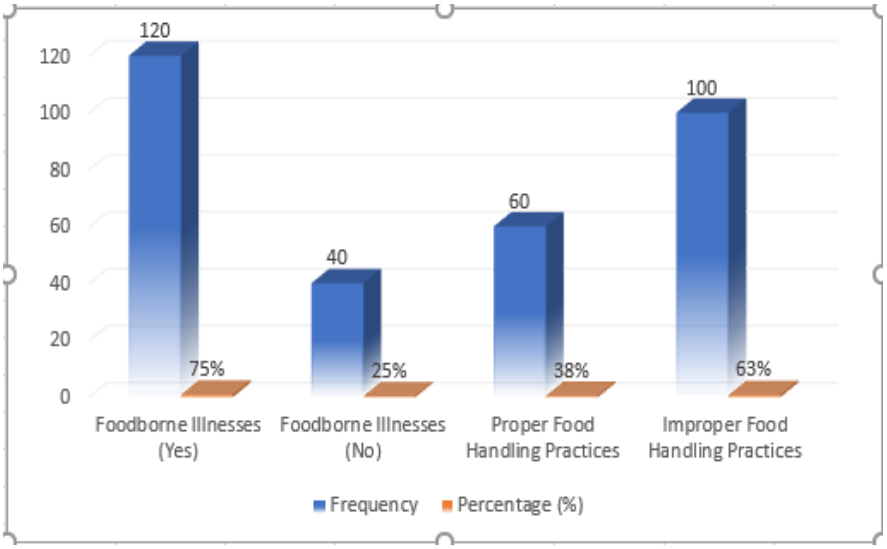

Figure 3. Food Safety Risks

Note: *This figure illustrates the prevalence of foodborne illness experience and food handling practices among respondents (N = 160). Twenty-five percent (40 respondents) reported experiencing foodborne illnesses, while 75% (120 respondents) did not. Proper food handling practices were reported by 38% (60 respondents), whereas 63% (100 respondents) did not practice appropriate food handling.*

Table 4 and Figure 4 enumerate factors influencing purchasing Decisions: the food Taste is recorded to be the most important factor in purchasing decisions, with 63%. For the food Price, half of the respondents consider price very important in the food purchasing decisions, representing 50%. For the Safety in purchasing decisions, only 38% of respondents prioritize safety. And for Trust in food purchasing decisions, most respondents do not trust street food vendors, representing 63%.

Table 4 lists Factors considered by respondents when Purchasing Street Food: Taste Purchasing Decisions account for 100 (63%), Price Purchasing Decisions 80 (50%), Safety Purchasing Decisions 60 (38%) and Consumer Trusting the street food 60 (38%), and Consumer not Trusting Street Food 100 (63%).

Table 4. Factors Considered When Purchasing Street Food

Variables	**Characteristic**	**Frequency**	**Percentage (%)**
Food Purchasing	Food Taste	50/160	31%
	Food Price	70/160	44%
	Food Safety	40/160	25%
Consumer Trust	Consumer Trust (Yes)	60/160	38%
	Consumer Trust (No)	100/160	63%

Note: *Frequencies represent the number of respondents in each category. - Percentages are calculated from the total sample size (N=160). - Categories under Factors considered in purchasing: taste, price, safety, trust.*

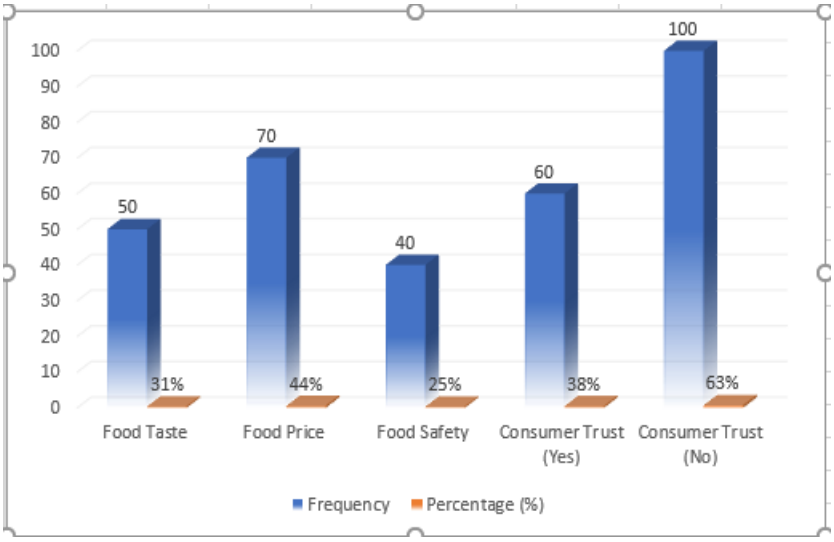

Figure 4. Factors Considered when Purchasing Street Food

Note: *This figure illustrates the key factors influencing street food purchasing decisions among respondents (N = 160). Taste influenced 100 respondents (63%), price influenced 80 respondents (50%), and safety influenced 60 respondents (38%). Regarding consumer trust, 60 respondents (38%) trusted street food vendors, while 100 respondents (63%) did not.*

Table 5 and Figure 5 list the environmental factors: for the clean environment, most of the respondents do not perceive the street food environment as clean, representing 63%. For Waste management, it is noted that Improper waste management is prevalent with 66%. And for Access to clean water, most of the respondents do not have access to clean water, representing 59%. This finding suggests that farmers in the study area are diversifying their crops to reduce the risks associated with climate change.

Table 5 lists the Environmental Factors about the Street Food Consumption: Clean environment of the Street Food Consumption account for 60 (38%), No Clean environment of the Street Food Consumption 100 (63%), Proper Waste Management 55 (34%), Improper Waste Management 105 (66%), Access to Clean Water 65 (41%), No Access to Clean Water 95 (59%).

Table 5. Environmental Factors

Variables	**Characteristics**	**Frequency**	**Percentage (%)**
Cleanliness	Cleanliness (Yes)	60/160	38%
	Cleanliness (No)	100/160	63%
Waste Management	Proper Waste Management	55/160	34%
	Improper Waste Management	105/160	66%
Access to Clean Water	Access to Clean Water (Yes)	65/160	41%
	Access to Clean Water (No)	95/160	59%

Note: *Frequencies represent the number of respondents in each category. - Percentages are calculated from the total sample size (N=160). - Categories under Environmental Factors: Cleanliness, Waste handling, water quality for usage.*

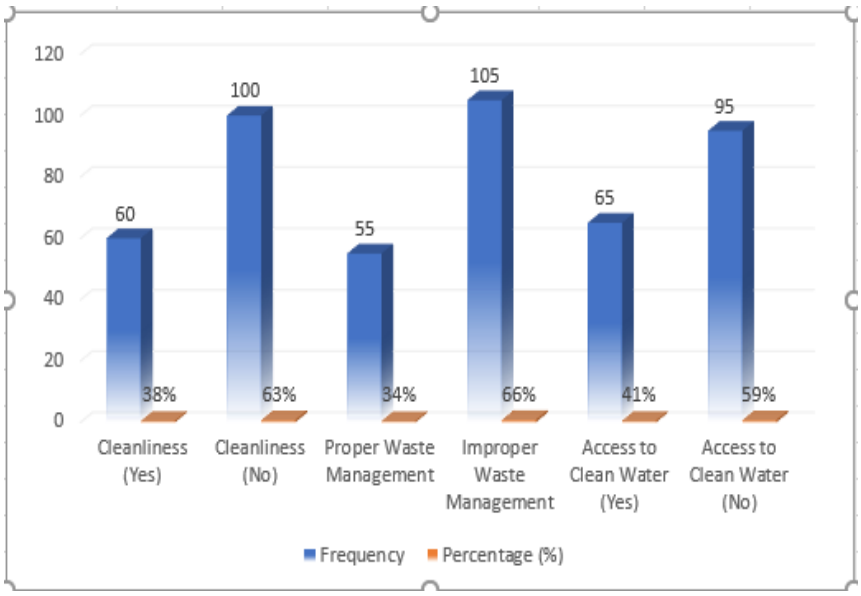

Figure 5. Environmental Factors

Note: *This figure presents environmental conditions related to street food consumption among respondents (N = 160). A clean environment was reported by 60 respondents (38%), while 100 respondents (63%) indicated an unclean environment. Proper waste management was practiced by 55 respondents (34%), with 105 respondents (66%) reporting improper waste management. Access to clean water was available to 65 respondents (41%), whereas 95 respondents (59%) lacked access.*

Conclusion

The study provides insights into the effects of the public health behavior of street food consumption among people living in Lubyayi city, Kabongo Health Zone, and identifies factors associated with safe food consumption practices. The study summarized the key findings and recommendations for improving food safety and reducing health risks associated with street food consumption. The study concluded that Inadequate food safety knowledge and poor food handling practices are common. The food Taste and price are prioritized over safety in purchasing decisions. The surrounding environmental factors, such as cleanliness and waste management, are very concerning. The consumers' trust in street food vendors is low. To support consumers in the study environment, it is recommended to provide consumers with accurate and timely food safety education to inform their decision-making. Provide Consumers and Vendors access to clean water and improve waste management habits. Provide Consumers and Vendors with training and capacity-building programs to enhance their knowledge and skills in proper food handling practices. Promote accountability and transparency among street food vendors and strengthen regulations and enforcement.

Source of Information

Questionnaire 2025.

Ethical Approval

Informed consent was obtained from the study respondents, and approval was obtained from the head office of the Rural Community Farmers Network (00516042025).

Conflict of Interest

No conflict of interest is attached to this article.

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References

[1]. FAO, IFAD, UNICEF, WFP, and WHO, 2020, The State of Food Security and Nutrition in the World. Transforming food systems for affordable, healthy diets. *Rome, FAO*. https://doi.org/10.4060/ca9692en.

[2]. World Health Organization, 2018, Food Safety. https://www.who.int/news-room/fact-sheets/detail/food-safety.

[3]. Kouamé, G. M., Beugré, G. F. C., & Amani, Y. C., 2021, Street Food around the World: A Review of the Literature. *Journal of Service Science and Management*, 14, 557-575. https://doi:10.4236/jssm.2021.146035.

[4]. Liu, Z., Zhang, G., & Zhang, X., 2020, Food safety knowledge, attitudes, and practices among street food vendors in urban areas. *Journal of Food Protection*, 83(4), 634-642. https://doi:10.4315/0362-028X.JFP-19-129.

[5]. Mwangi, A. M., 2018, Street food vending in urban areas: A review of the literature. *Journal of Urban Health*, 95(2), 157-166. https://doi:10.1007/s11524-018-0246-6.

[6]. Nanyonga, S., 2020, Food safety risks associated with street food consumption in urban areas. *Journal of Environmental Health Science & Engineering*, 18(2), 637-646. https://doi:10.1007/s40201-020-00534-6

[7]. Schoder, D., 2019, Street food safety: A review of the current situation. *Journal of Foodborne Diseases*, 36(3), 251-262.

[8]. WHO, 2017, *WHO's Work on Food Safety*.

[9]. Grace, D., 2015, Food safety in developing countries: An overview. *International Journal of Environmental Research and Public Health*, 12(10), 13071-13084. https://doi:10.3390/ijerph121013071

[10]. Rheinländer, T., 2018, Food safety knowledge and practices among street food vendors in a Ghanaian city. J*ournal of Food Protection*, 81(10), 1640-1648. https://doi:10.4315/0362-028X.JFP-18-088

[11]. Soon, J. M., 2018, Food safety training for street food vendors: A systematic review. *Journal of Food Protection*, 81(5), 796-804. https://doi:10.4315/0362-028X.JFP-17-157

[12]. Ababio, P. F., 2018, Food safety knowledge, attitudes, and practices among food handlers in Ghana. *Journal of Food Protection*, 81(1), 104-114. https://doi:10.4315/0362-028X.JFP-17-088

[13]. Liu, X., 2020, Food safety risks and control strategies for street food in China. *Journal of Foodborne Diseases*, 37(1), 53-63.

[14]. Martins, J. H., 2019, Street food vendors' knowledge, attitudes, and practices regarding food safety in South Africa. *Journal of Food Protection*, 82(6), 936-944. https://doi:10.4315/0362-028X.JFP-18-140

[15]. Samapundo, S., 2019, Food safety knowledge, attitudes, and practices among street food vendors in Cambodia. *Journal of Food Protection*, 82(5), 746-754. https://doi:10.4315/0362-028X.JFP-18-130.

[16]. Muyanja, C., 2018, Food safety risks associated with street foods in Kampala, Uganda. *Journal of Foodborne Diseases*, 35(2), 143-153.

[17]. Alimi, B. A., 2018, Food safety knowledge and practices among street food vendors in Nigeria. *Journal of Food Protection*, 81(8), 1340-1348. https://doi:10.4315/0362-028X.JFP-18-022.

[18]. Lee, S. M., 2020, Street food consumption and food safety concerns in Korea. *Journal of Foodborne Diseases*, 37(2), 123-133.

[19]. Nguyen, T. T., 2019, Food safety knowledge and practices among street food vendors in Vietnam. *Journal of Food Protection*, 82(4), 624-632. https://doi:10.4315/0362-028X.JFP-18-124

[20]. Ortega, D. L., 2019, Food safety and street food consumption in the Philippines. *Journal of Foodborne Diseases*, 36(1), 31-41.

[21]. Kabui, E. W., 2019, Food safety knowledge and practices among street food vendors in Kenya. *Journal of Food Protection*, 82

[22]. Mensah, P., 2018, Food safety risks associated with street food consumption in Ghana. *Journal of Foodborne Diseases*, 35(3), 201-211.

[23]. Omemu, A. M., 2019, Food safety knowledge and practices among street food vendors in Nigeria. *Journal of Food Protection*, 82(7), 1080-1088. https://doi:10.4315/0362-028X.JFP-18-156.

[24]. Park, S. H., 2020, Street food consumption and food safety concerns in Korea. *Journal of Foodborne Diseases*, 37(3), 253-263.

[25]. Rane, S., 2019, Street food safety: A review of the current situation in India. *Journal of Foodborne Diseases*, 36(2), 101-111.
[26]. Soon, J. M., 2020, Food safety training for street food vendors: A systematic review and meta-analysis. *Journal of Food Protection*, 83(5), 836-844. https://doi:10.4315/0362-028X.JFP-19-158.
[27]. Tumwine, J. K., 2018, Food safety knowledge and practices among street food vendors in Uganda. *Journal of Food Protection*, 81(9), 1520-1528. https://doi:10.4315/0362-028X.JFP-18-094.
[28]. Wu, Y., 2020, Food safety risks and control strategies for street food in China. *Journal of Foodborne Diseases*, 37(4), 401-411.
[29]. Youssef, A. E., 2019, Food safety knowledge and practices among street food vendors in Egypt. *Journal of Food Protection*, 82(8), 1348-1356. https://doi:10.4315/0362-028X.JFP-18-166.
[30]. Zhang, W., 2020, Street food consumption and food safety concerns in China. *Journal of Foodborne Diseases*, 37(5), 513-523. 31. Lubyayi Health District source 2024.

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Political Parties, Elections, and Gender Representation: A Comparative Study of Women's Performance in the 2019 Elections in India and Nigeria

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Abstract

This study examines women's performance in the 2019 elections in India and Nigeria, within the context of political parties' values, election dynamics, and gender representation in the two world's male-dominated democracies. Using mixed-methods with SPSS version 2.0 to analyse data from 100 participants, this study analyses the institutional, political, economic, and socio-cultural factors that influence or hinder women's electoral success, despite shared colonial histories and Westminster-style political systems. The results, however, highlight the similarities and differences in representation between the two countries. Both had similar shares of female candidates, 8.9% in India and 8.0% in Nigeria. However, success rates varied: female MP candidates comprised 14.4% of India's House of Representatives but only 3.1% in Nigeria. Voter turnout was similar, with 67.2% of women and 67.0% of men participating in India. Nigeria had lower overall participation, at 36% of the total voters. Also, Indian and Nigerian party inclusion strategies differ; Nigeria relies on patronage and is restricted by religious influence, gender violence, and high nomination fees. India's constitution supports women's participation amidst male dominance, unlike Nigeria, where the uncertainty about women in politics is higher than in India. Nonetheless, the UN, African Union, ECOWAS, and IDEA found that party elites' control over candidate selection, violence, vote-buying, and logistical issues compromised electoral credibility and inclusivity. Participants recommend legislative or party quotas, along with funding, as essential to improving women's political representation and promoting gender equality.

Keywords: *Election, Gender, Male Dominance and Comparative Politics, Representation, Participation, Political Parties, Women.*

Introduction

The World Bank Demography Survey 2025 [1] states that women constitute 49.4% of Nigeria's population of 237.5 million and 48.44% of India's population of 1.44 billion. Besides, Nigeria, with 2.9% of the global population, is the sixth most populous, while India, with 8.17%, is the most populous. Despite being the largest democracies in Africa and Asia, women face underrepresentation and gender inequality in both nations. Feminist scholar Brule (2022) [2] notes that political processes remain male-dominated despite decades of independence. Therefore, the study compares women's performance in the 2019 Indian and Nigerian elections, which have held seven and eighteen elections since 1999 and 1947, respectively, and is evidently a key to addressing gender disparities.

Pry's 2012 study [3] traced elections from ancient Athens and Rome, evolving through European democratic traditions before being adopted by colonial and post-colonial societies, thereby shaping modern governance. Pry recalled Aristotle's concept of representation, which explored "Oligarchy" rule by a few, as women struggled with universal suffrage achieved in Britain (1928), the US (1920), India (1950), Nigeria (1954), Nigeria's Northern

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region (1979), and Saudi Arabia (2015) inter alia.

This study highlights that, despite increased voting rights for women, representation remains low. Nigerian women, who constitute 37% of registered voters in the 2019 INEC voter registration [4], are underrepresented. In India, female voter turnout was 67.2% in 2019, slightly higher than men's at 67.0%. Nigeria elected only three female senators out of 109 in 2023, with no female governors or major-party female presidential candidates. India has had one female Prime Minister and two female Senate Presidents, but overall female political representation remains below global averages and the UN's 35% target.

The global perspective on gender in politics reveals disparities: Nigeria is ranked 184th and India 144th in terms of women's parliamentary representation, according to the IPU [5]. In Nigeria's 2019 elections, eight women (2.3%) were elected to the 109-seat Senate, and 11 women (3.1%) were elected to the 360-seat House of Representatives. India elected 78 women (14.4%) to the 543-seat Lok Sabha and 33 women (13.9%) to the 237-seat Rajya Sabha. These numbers highlight ongoing gender gaps in both countries.

The Inter-Parliamentary Union also reports that countries like Rwanda (61.3%), Bolivia (53.1%), Cuba (48.9%), Mexico (48.5%), and Costa Rica (47.5%) have high female parliamentary representation. This demonstrates that gender parity is achievable across diverse systems through methods such as quotas, mandates, cultural shifts, and changes in gender norms. In the US, there are institutional arrangements that perpetuate gender gaps. In recent elections, featuring Mrs Clinton in 2016 and Harris in 2024, both candidates lost partly due to the Electoral College system, which requires 270 of the 538 votes based on popular support [6]. Feminist scholar Brule argued that women have less influence in electoral decisions, which impedes systemic change, and felt overwhelmed by the barriers and social inequalities they faced during the 2019 election [7]. Carnegie's research [8] on the 2019 Nigerian election [8] found that 807 petitions were filed, of which 582 were dismissed, 12 were withdrawn, and 30 resulted in court-ordered reruns, highlighting electoral challenges that limit equal participation.

The research employs multidimensional theories, including Marxian Weber Class Representation Theory, Majoritarian Pluralism Theory, Liberal Feminist Theory, Institutional Theory, Critical Mass Theory, Intersectionality, Consociationalism Theory of power sharing, [9] and the Conservative Force of 'Machismo' Theory, to examine the factors that perpetuate gender inequalities in politics. It also applies the UN-TACT framework (Think, Assess, Consider, and Take Action), developed to analyse how women can navigate systemic barriers of institutional exclusions and socio-cultural forces that support male dominance.

Purpose of Study

The research highlights the ongoing underrepresentation of women in electoral politics, despite commitments to gender equality. Political parties often prefer male-focused nominations and lack enough gender-sensitive policies. Awe [10] notes that poor policy implementation and socio-biological perceptions hinder women's participation. Economic and cultural barriers based on patriarchal values worsen these issues. The UN Secretary-General, Antonio Guterres (2022), [11] noted that achieving gender equality will take 300 years, and reaching 50% representation by 2030 may no longer be feasible, underscoring the importance of the study. To address this, the study examines the underrepresentation in the 2019 elections in Nigeria and India with the following specific objectives.

1. To analyse women's performance in the 2019 general elections in Nigeria and India.

2. To examine institutional, Economic, Political, and Socio-cultural perceptions, including electoral regulations, campaign funding, and Political parties ' challenges regarding the 2019 elections, if any, that have promoted or marginalised women.
3. Investigate the variables contributing to women's electoral performance in the face of male dominance in the political parties.
4. Investigate areas of commonalities and differences between India's and Nigeria's general elections, political parties' mechanisms, and gender representation in 2019.
5. Propose country-specific measures to enhance women's future performance in elections.

Descriptive Analysis Framework

The study discussed the following descriptive framework.

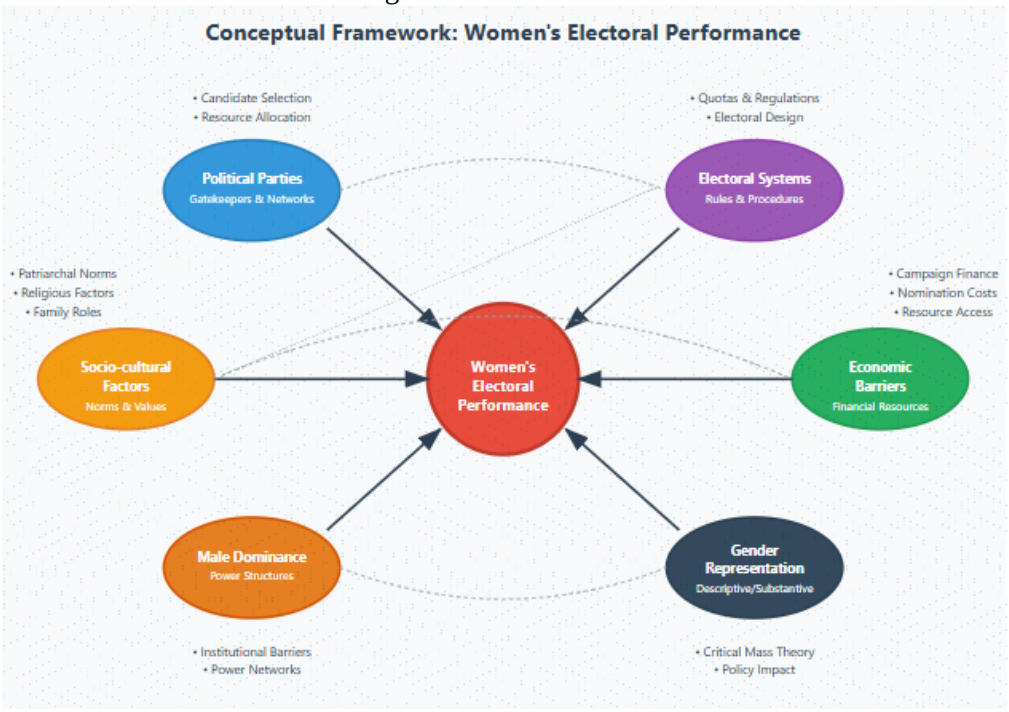

Figure 1. Conceptual Framework on Women's Electoral Performance.

Source: Author's Designed Framework

Electoral System: Constitutional and Legal Framework

A 2024 Indian Constitutional Observation Forum Research study [12] on Indian legal frameworks highlights global strategies for achieving gender equality in politics. India's constitution, primarily through the 73rd and 74th Amendments of 1993, allocates one-third of local government seats for women. Thirty years later, approximately 1.4 million women have been elected to local offices, establishing a strong foundation for political participation that extends beyond symbolism. Similar quotas are absent at the state and national levels; the 2022 Women's Reservation Bill, passed by the BJP, remains unimplemented. In contrast, Nigeria's 1999 Constitution [13] lacks amendments like India's, which makes gender representation more difficult. It maintains rules that promote men's political agenda, despite promising to treat everyone equally. For example, Section 42(3) prohibits discrimination in public employment. Aina noted that Section 26 restricts citizenship by registration to women married to Nigerian men, thereby creating obstacles for women to participate in politics. Also, she described the nature of gender rights in the constitution, which uses patriarchal language, with 'he' appearing 235 times and

'woman' only twice [14]. Significantly, shows both countries' electoral systems are gender-blind, ignoring the barriers women face and the lack of enforcement measures.

Political Party Dynamics and Institutional Barriers

Political parties have a crucial influence on women's electoral access through their structures, cultures, and nomination processes. Bassey [15] notes that parties often prefer wealthy or elite candidates for financial backing, overlooking merit, which puts women with limited means at a disadvantage. Besides, observers' reports in the 2019 elections highlighted that patriarchal values were seen as demeaning across Zimbabwe, Africa, and parts of Asia due to women's political roles being seen as threats to traditional norms, which coexist with informal networks supporting men [16].

Malhotra pointed out that India's caste system adds complexity, with caste factors influencing whether gender hierarchies are reinforced in regional or party contexts [17]. Awe described Nigerian parties as personalised, patronage-based, and nomination-based, with "godfathers" controlling candidate selection. This system creates disadvantages for women, while Indian parties have more institutionalised, gender-sensitive nomination processes [18].

Socio-Cultural Factors and Gender Norms Barrier

Research shows that socio-cultural factors shape women's political participation in both countries. Sule, Adamu, and Sambo [19] note that cultural views of women as mothers and caregivers often conflict with political roles that require travel, irregular hours, and public exposure. These expectations are reinforced by religious teachings, traditions, and societal norms that depict politics as a “masculine domain”. Sambo distinguished the religious role as an evidential factor in Nigerian politics compared to India, due to the conservative interpretations of religious texts that are often used to justify the exclusion of women from political leadership.

The intersection of education and economic factors creates additional barriers; even educated women may lack the financial resources needed for campaigns.

Economic Barriers and Campaign Financing

The UNIFEM 2019 Annual Gender Donor Roundtable (GDRT) highlights that economic barriers are immediate and significant obstacles to women's political participation in both countries. Women’s underrepresentation and challenges in campaign financing affect all candidates, but they impact women more significantly, given their limited access to personal wealth, networks, and informal funding. The high costs of nomination forms, campaign materials, and electoral activities are significant hurdles, especially in Nigeria, where nomination fees are often prohibitively expensive and formal banking systems or family resources may be insufficient for competitive campaigns. The 2019 Carnegie study highlights differences between India and Nigeria in campaign finance and support. Indian parties tend to offer better support for female candidates, whereas Nigerian parties often expect candidates to self-fund, regardless of gender. This shows broader differences in party institutionalisation and resource use.

Salimi’s study highlights factors affecting women's political rise. Indira Gandhi, India's Prime Minister (1966-1977, 1980-1984), exemplifies effective female leadership, which, apart from her 1984 assassination, owed much to her family legacy as Nehru's daughter [22], illustrating how dynasties help women's advancement but may restrict others. Nigeria, by contrast, has not had a female president or prime minister since its independence, Onuoha and Ojo [23]. Nigeria's first election was held in 1959, with local rulers managing governance

under colonial rule until a military takeover in the 1970s, which led to their continued rule until 1999.

Women's Political Leadership and Performance

INEC Nigeria's 2018 record [24] noted Patricia Etteh as Nigeria's highest-ranking woman, serving briefly as House Speaker in 2007. The contrast highlights cultural attitudes, institutional support or barriers, and the impact of political violence on women's political ambitions. The analysis reveals the underrepresentation of women in legislative positions in both countries, with notable differences. Data from IPU 2018 [25] indicate that India's women's representation increased from 9.5% in 1999 to 14.3% in 2019, while Nigeria's remained stagnant or declined.

Comparative Electoral Systems and Outcomes

According to IDEA [26], electoral system comparisons demonstrate how institutional arrangements shape gender representation. India and Nigeria use first-past-the-post systems in single-member constituencies, which are less effective for women than proportional systems. However, implementation and cultural context create different opportunities and constraints. IDEA's federal structure and regional parties in India support women's political progress, with some states and parties doing better. According to ECI [27], women's representation in local governance has created a pipeline of female politicians for higher elections. Nigeria's political system has been marred by leaders who manipulate power, resulting in widespread corruption and calls for reform. The 2019 election choice of godfatherism saw APC's President Buhari's 'Kabals' influence politics through bias, fueling violence and insurgency, challenging gender equity policies. Thus, women's representation hinges on competitive elections; however, Nigeria's history shows that those in control often disregard public opinion, and Nigerian women must therefore forge their own path to power.

Method

This research employs a comprehensive mixed-methods approach designed to provide insights into women's electoral performance and a qualitative understanding of the complex factors influencing gender representation in electoral politics. The methodological framework combines comparative analysis techniques with multiple data collection methods to ensure a thorough examination of political parties, elections, and gender representation in the 2019 general elections in India and Nigeria through 100 participants, as described in Table 1 below.

Table 1. Overview of The Mixed Method Design Adopted

Overview of the Mixed Methods Research Adopted		
	Qualitative Research	**Quantitative Research**
The Subject-Matter	Explored the concepts of political parties' Elections and gender representation in India and Nigerian politics through investigation, utilising data gathered from both primary and secondary sources, rather than relying solely on literature.	Interpreted the data and statistics received to confirm objectives and assumptions.
Methodologies	Inclusive of ethnography, such as getting detailed insights into the complexities of women's low performance in the political culture of male dominance through the methodology of research design, such as data collection methods, ie, tools and procedures, data analysis,	Observational investigational

	techniques (statistical tests or qualitative analysis), sampling techniques, and ethical consideration.	
Approach	Explored 100 participants through the inductive approach of bottom-up, with the use of tools and data cited below:	Deductive: scientific study of the 100 participants knowledgeable about political parties and elections to obtain conclusions on gender performance.
Sampling Methods	Inclusive of purposive, convenience, and snowball sampling to select participants.	convenience, purposeful
Tools used for Data collection	• Structured interviews, • Focus-group-interviews • Participants/non-participants' • Observation, lived experience • Open-ended diaries, • Review of testimonies, • archival Information • website algorithms, documents, and notes.	Prospective or reflective (ex post facto) data, Questionnaires, and Focus Group discussions (FGD) were used to ascertain the assumptions.
Data Analysis	Transcription verbatim, coding, to support the discourse, content, thematic, or descriptive analysis	Data was analysed using SPSS software for coding.
Presentation of Findings **Limitations** **Conclusions**	Numerous interactive interpretations, Verbatim quotes, categorising, themes, a conceptual framework, and research objectives were utilised to aid understanding. Limitations were identified through the use of inclusive and exclusive criteria in selecting participants and procedures, which adhered to the rules. Ethical conditions were followed.	There were descriptive, inferential, and reflective numerical forms, accompanied by tables and graphs to support analyses of variance, frequency distributions, position, correlation, cross-tabulation, and regression.

Source: Adopted from Kothari, C. R. (2004). Research methodology: Methods and techniques (2nd Ed). New Age International, Limited, Publishers. New Delhi: India

Ethical principles include ensuring participant safety, data integrity, informed consent, confidentiality, and anonymity are strictly adhered to. Participants are informed, and their identities are protected using anonymised identifiers. Data collection was done through a specialised website, www.gender-tda.org, to enhance data privacy and anonymity. The research respects Nigeria and India's cultural diversity, tailoring questionnaires and interviews to gain a deeper understanding of participants' perspectives.

Results Presentation and Analysis

Overview

This chapter presents the findings from the research conducted on political parties, elections, and gender representation in India and Nigeria, with a specific focus on women's performance in the 2019 general elections. Throughout the chapter, comparative analyses are provided between India and Nigeria to highlight similarities and differences in gender representation patterns and their determinants. The findings are presented using tables, charts, and thematic analyses of qualitative responses, offering a comprehensive understanding of the complex interplay of factors affecting women's political participation and performance in these two significant democracies.

Demographic Profile of Participants

The research involved 100 participants, equally divided between India and Nigeria, classified into four categories. The

demographic characteristics of the participants are summarised in Tables 2 and 3.

Table 2. Distribution of Participants by Category and Country

Participants Category	**India**	**Nigeria**	**Total**
Political Party Members and Electoral Management Body Stakeholders	20	20	40
Members of the Public	10	10	20
Female Politicians and Candidates	15	15	30
Male Elected Candidates	5	25	10
Total	50	50	100

Source: Field Work Findings

Table 3: Demographic Characteristics of Participants

Characteristic	**India (n=50)**		**Nigeria (n=50)**		**Total (N=100)**	
	Frequency	**Percentage**	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Gender						
Male	20	40.0%	20	40.0%	40	40.0%
Female	30	60.0%	30	60.0%	60	60.0%
Age Group						
18-30 years	7	14.0%	6	12.0%	13	13.0%
31-40 years	15	30.0%	18	36.0%	33	33.0%
41-50 years	18	36.0%	16	32.0%	34	34.0%
51-60 years	7	14.0%	8	16.0%	15	15.0%
Above 60 years	3	6.0%	2	4.0%	5	5.0%
Educational Level						
Secondary	5	10.0%	7	14.0%	12	12.0%
Tertiary	28	56.0%	25	50.0%	53	53.0%
Postgraduate	17	34.0%	18	36.0%	35	35.0%
Political	**Affiliation**					
Major Parties*	28	56.0%	26	52.0%	54	54.0%
Minor Parties	12	24.0%	14	28.0%	26	26.0%
No Affiliation	10	20.0%	10	20.0%	20	20.0%

**Major Parties: In India - BJP and INC; In Nigeria: APC and PDP*

Source: Field Work Findings.

The demographic data show a balanced gender distribution among participants, with 60% female and 40% male respondents in both countries, reflecting the study's focus on gender representation. The age distribution indicates that most participants (67%) were between 31 and 50 years old, with similar patterns across both countries. Educational levels were relatively high, with 88% of participants having tertiary or postgraduate education. Regarding political affiliation, slightly more than half of the participants (54%) were affiliated with major political parties, 26% with minor parties, and 20% had no political affiliation.

Objective 1 - To Analyse Women's Electoral Performance in The 2019 General Elections in Nigeria and India.

Representation of Women as Candidates and Elected Officials

The 2019 general elections in both India and Nigeria witnessed varying levels of women's participation as candidates and elected officials. Table 4 presents the comparative data on women's candidature and electoral success in both countries.

Table 4. Comparative Data of Women's Representation in the 2019 General Elections

Parameter	India	Nigeria
Candidature		
Total Number of Candidates	8,049	4,680
Number of Female Candidates	719 (8.9%)	374 (8.0%)
Electoral Success		
Total Elected Representatives (Lower House)	543	360
Number of Elected Female Representatives	78 (14.4%)	11 (3.1%)
Voter Participation		
Male Voter Turnout	67.0%	35.6%
Female Voter Turnout	67.2%	34.8%

Sources: Field Work Findings. Election Commission of India (ECI) (2019), and Independent National Electoral Commission of Nigeria (INEC) (2019).

The data reveals significant disparities in women's representation between the two countries. While the percentage of female candidates was similar in both India (8.9%) and Nigeria (8.0%), there was a stark difference in electoral success rates. In India, 14.4% of the elected representatives in the Lok Sabha (the House of Representatives) were women, compared to only 3.1% in Nigeria's House of Representatives. This indicates that female candidates in India had a higher success rate than their candidature percentage would suggest. In contrast, in Nigeria, women's already low candidature translated into even lower representation in elected positions. Regarding voter participation, India demonstrated gender parity, with female voter turnout (67.2%) marginally exceeding male turnout (67.0%). In contrast, Nigeria showed lower overall voter participation and a small gender gap, with male turnout (35.6%) slightly higher than female turnout (34.8%).

Perceptions of Women's Political Participation

Participants were asked to rate women's political participation in the 2019 elections on a scale of 1 to 10, 1 indicating "very poor" and 10 indicating "excellent." The responses are summarised in Figure 2.

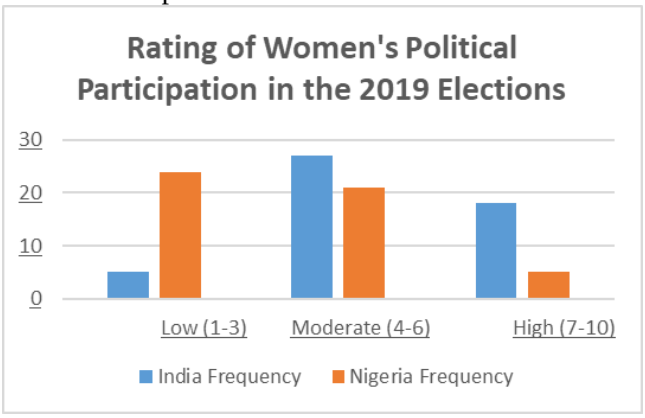

Figure 2. Rating of Women's Political Participation in the 2019 Elections

Source: Fieldwork findings

When asked to defend their ratings, participants provided various reasons reflecting the complexities of gender representation in politics. These qualitative responses were analysed thematically, and the key themes are presented in Table 5 and Figure 3 below.

Objective 2. To examine Institutional, economic, Political, and Socio-cultural factors or perceptions, including electoral regulations and the challenges faced by women in the political parties regarding the 2019 elections, if any, that have promoted or marginalised women.

Table 5. Thematic Analysis of Women's Political Participation

Theme	India	Nigeria	Combined
Institutional barriers	22%	28%	25%
Socio-cultural factors	26%	32%	29%
Economic constraints	15%	18%	16.5%
Political party dynamics	24%	16%	20%
Personal/Individual factors	13%	6%	9.5%

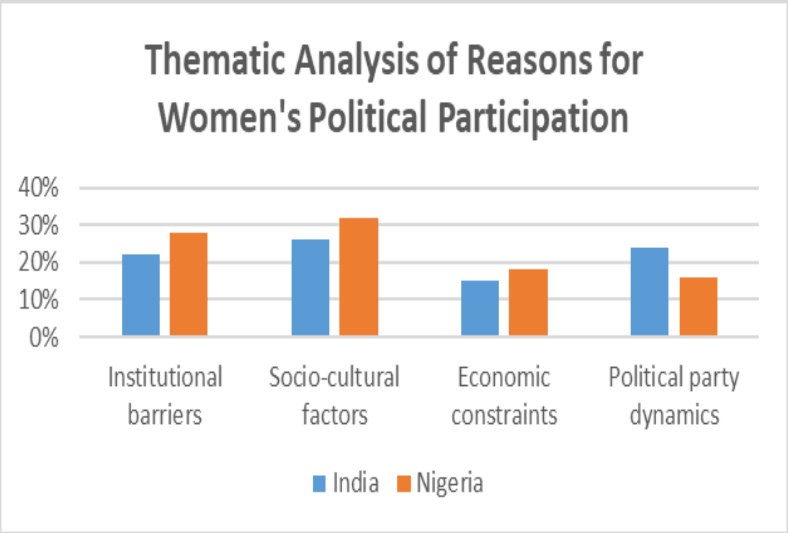

Figure 3. Field Work Findings

In both countries, socio-cultural factors emerged as the most significant theme, accounting for 29% of responses overall (26% in India and 32% in Nigeria). Institutional barriers were cited more frequently by Nigerian respondents (28%) compared to Indian respondents (22%). Political party dynamics were acknowledged more often by Indian participants (24%) than Nigerian participants (16%), suggesting different perceptions of how party structures influence gender representation in the two countries.

Knowledge and Awareness of Electoral Regulations and Gender Representation

Awareness of Electoral Regulations: Participants' knowledge of electoral regulations related to gender representation was assessed through several questions. The responses are summarised in Table 6 below.

Table 6. Knowledge of Electoral Regulations (% of Respondents Who Answered "Yes")

Knowledge Item	India	Nigeria	Chi-Square	p-value
Aware of constitutional provisions regarding equal political rights	84%	76%	1.05	0.306
Aware of electoral regulations regarding gender representation	78%	70%	0.87	0.351
Aware of gender neutrality principles in electoral laws	72%	64%	0.76	0.383
Aware of special provisions/quotas for women in politics	86%	52%	13.52	0.000*
A higher awareness of electoral regulations than	68%	58%	1.09	0.296

**Statistically significant at p < 0.05*

Source: Field Work Findings

The results indicate that Indian respondents generally have higher awareness of electoral regulations than Nigerian respondents across all knowledge items. However, the chi-square tests reveal that most of these differences were not statistically significant, except for awareness of special provisions/quotas for women in politics. The significant difference ($p < 0.001$) in this item reflects India's more extended history with gender quotas at the local government level, which have been in place since 1993 through the 73rd and 74th Constitutional Amendments.

Perception of Electoral Management Bodies' Implementation of Gender-Neutral Principles: Participants were asked to rate the extent to which electoral management bodies (the Election Commission of India and the Independent National Electoral Commission in Nigeria) implemented gender-neutral principles in the 2019 elections, as presented in Figure 4.

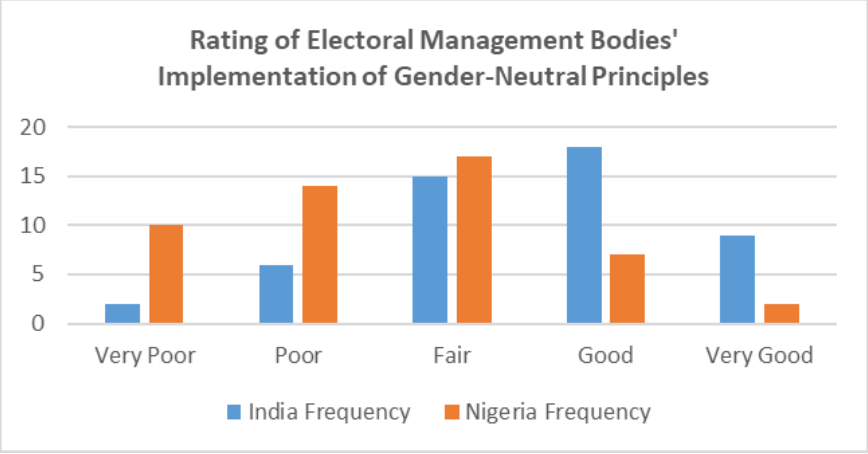

Figure 4. Rating of Electoral Management Bodies' Implementation of Gender-Neutral Principles

Source: Field Work Findings

The data reveals more positive perceptions of electoral management bodies in India, with 54% of respondents rating the Election Commission of India's implementation of gender-neutral principles as "Good" or "Very Good," compared to only 18% for Nigeria's Independent National Electoral Commission. Conversely, nearly half of Nigerian respondents (48%) rated their electoral commission's performance as "Poor" or "Very Poor," compared to just 16% in India.

Factors Influencing Women's Performance in the 2019 Elections

Political Party Dynamics

Political party dynamics were explored through questions about party rules, candidate selection processes, and support for female candidates. Figure 5 summarises the findings regarding the representation of women in party executive positions.

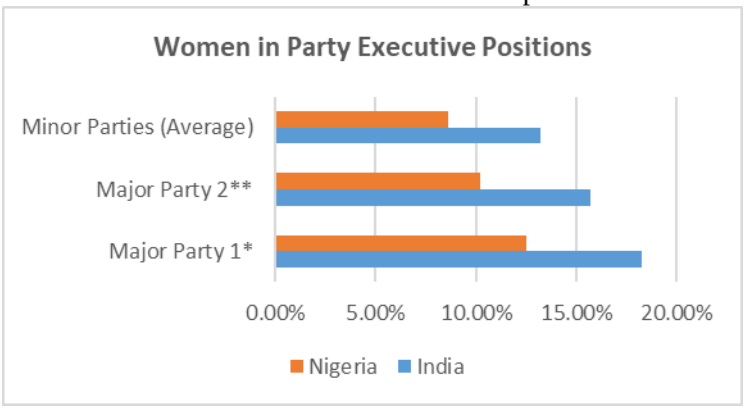

Figure-5. Representation of Women in Party Executive Positions

Source: Field Work Findings

The data indicate a higher representation of women in party executive positions in India (16.1%) compared to Nigeria (10.7%). In both countries, major parties had better representation than minor parties, with the first major party showing the highest percentage in each country. Participants were also asked about factors within political parties that influenced women's candidature, as shown in Figure 6.

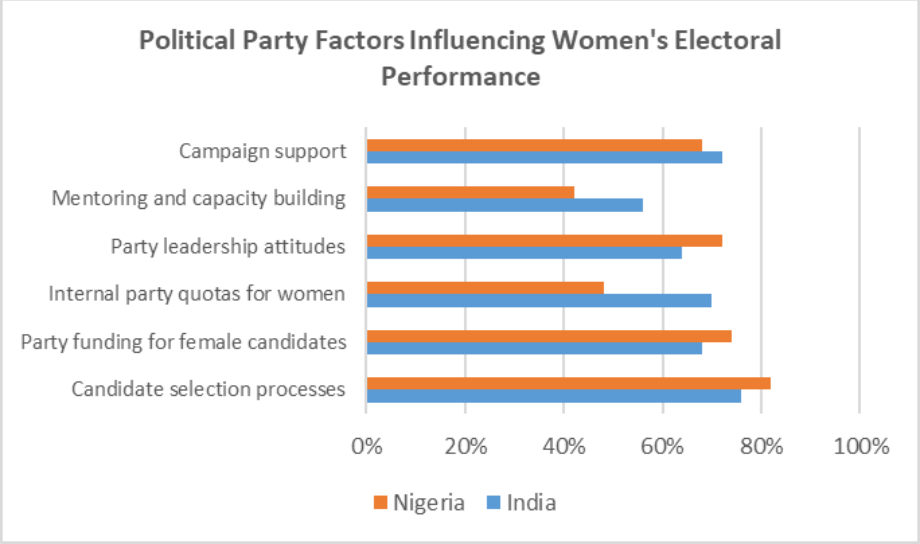

Figure 6. Political Party Factors Influencing Women's Performance.

Source: Field Work Findings

Candidate selection processes emerged as the most frequently mentioned factor in both countries (76% in India and 82% in Nigeria), followed by party funding for female candidates (68% in India and 74% in Nigeria). Notable differences include the emphasis on internal party quotas in India (70%) compared to Nigeria (48%), and the greater emphasis on party leadership attitudes in Nigeria (72%) compared to India (64%). The focus group discussions with political party members revealed additional insights into party dynamics, as shown in the key themes analysis presented in Table 7.

Table 7. Key Themes from Focused Group Discussions with Party Members

Theme	Key Findings
Intra-party Democracy	- More structured nomination processes in Indian parties - More personalised and patronage-based selection in Nigerian parties - Limited transparency in both countries, but more formal procedures in India
Financial Support	- Better financial support mechanisms for female candidates in Indian parties - Higher financial barriers for women in Nigerian politics - Informal funding networks are more accessible to men in both countries
Party Ideology	- Greater ideological commitment to gender equality in some Indian parties - More conservative gender norms in Nigerian party structures - Instrumental approach to women's representation in both countries
Organizational Culture	- Male-dominated party cultures in both countries - More formalised women's wings in Indian parties - Greater intimidation and harassment reported by Nigerian female politicians

Source: Field work findings

Socio-cultural Factors

Socio-cultural factors affecting women's political participation were assessed through multiple questions across all participants. The percentage of respondents who agreed that specific socio-cultural factors influenced women's performance in the 2019 elections is cited in Table 8 and Figure 7.

Table 8. Socio-cultural Factors Influencing Women's Electoral Performance (% Agreeing)

Factor	India	Nigeria	Chi-Square	p-value
Patriarchal social norms	82%	90%	1.47	0.225
Family responsibilities	78%	84%	0.64	0.424
Religious factors	56%	84%	9.60	0.002*
Traditional gender roles	80%	88%	1.33	0.249
Educational disparities	62%	76%	2.38	0.123
Media portrayal of female politicians	74%	68%	0.48	0.488
Gender-based violence/intimidation	58%	82%	7.14	0.008*

Source: Field Work Findings

**Statistically significant at $p < 0.05$*

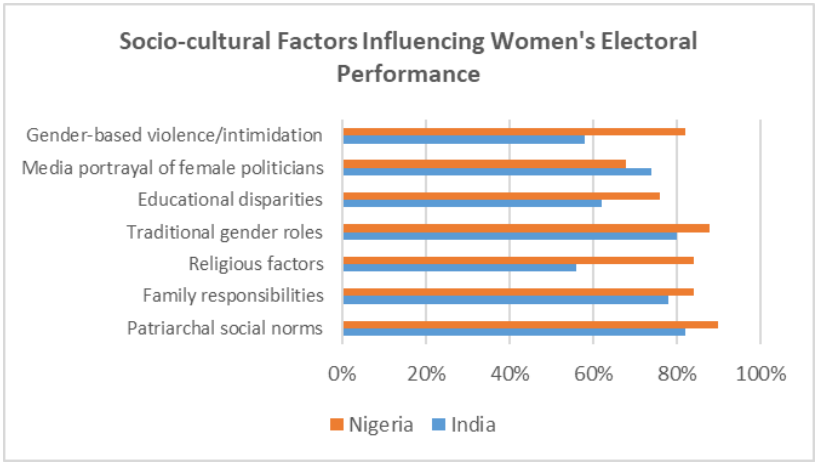

Figure 7. Socio-Cultural Factors Influencing Women's Electoral Performance

Source: Field Work Findings

The results indicate that patriarchal social norms and traditional gender roles were perceived as highly influential in both countries, with no statistically significant differences between India and Nigeria. However, significant differences were observed in the perceived influence of religious factors ($p = 0.002$) and gender-based violence/intimidation ($p = 0.008$), with higher percentages of Nigerian respondents identifying these factors as important influences on women's electoral performance.

Economic Factors

Economic barriers to women's political participation were explored through questions about campaign financing, economic independence, and resource allocation. The findings are in Table 9 and Figure 8.

Table 9. Economic Factors Influencing Women's Electoral Performance (% Agreeing)

Factor	India	Nigeria	Chi-Square	p-value
Campaign financing difficulties	86%	92%	1.05	0.306
Limited access to economic resources	78%	84%	0.64	0.424
Cost of nomination forms	62%	88%	9.60	0.002*
Dependency on male sponsors	70%	84%	2.92	0.087
Lower economic status of women	76%	82%	0.59	0.442
Insufficient party funding	68%	74%	0.48	0.488

Source: Field Work Findings

**Statistically significant at $p < 0.05$*

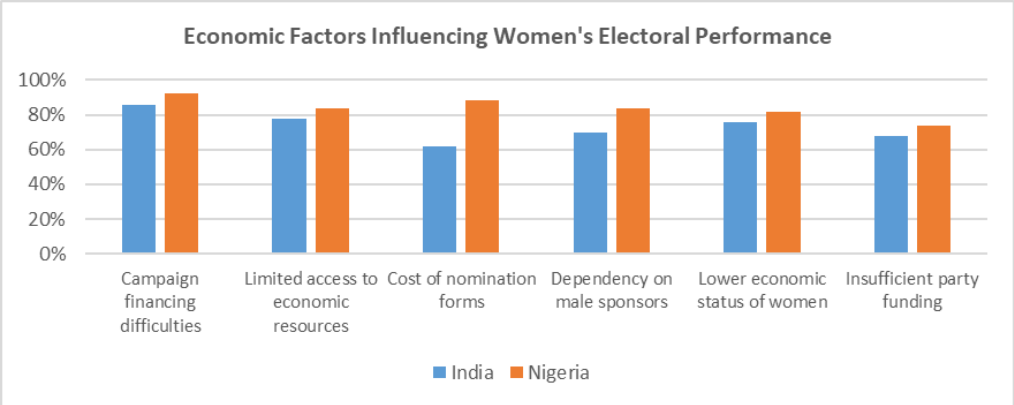

Figure 8. Economic Factors Influencing Women's Electoral Performance

Source: Field Work Findings

Campaign financing difficulties and limited access to economic resources were identified as major barriers in both countries, with no statistically significant differences between them. However, a significant difference was observed in the perceived influence of the cost of nomination forms ($p = 0.002$), with a higher percentage of Nigerian respondents (88%) identifying it as a barrier than Indian respondents (62%).

Institutional Factors

Institutional factors affecting women's political participation were assessed through questions about electoral systems, quotas, and legislative frameworks—table 10 and Figure 9 present the findings.

Table 10. Institutional Factors Influencing Women's Electoral Performance (% Agreeing)

Factor	India	Nigeria	Chi-Square	p-value
Electoral system design	72%	68%	0.20	0.655
Absence of legislative quotas	88%	82%	0.76	0.383
Party registration requirements	46%	64%	3.31	0.069
Electoral commission policies	58%	70%	1.65	0.199
Implementation of existing laws	66%	78%	1.88	0.170
Legal framework for gender equality	64%	72%	0.78	0.377

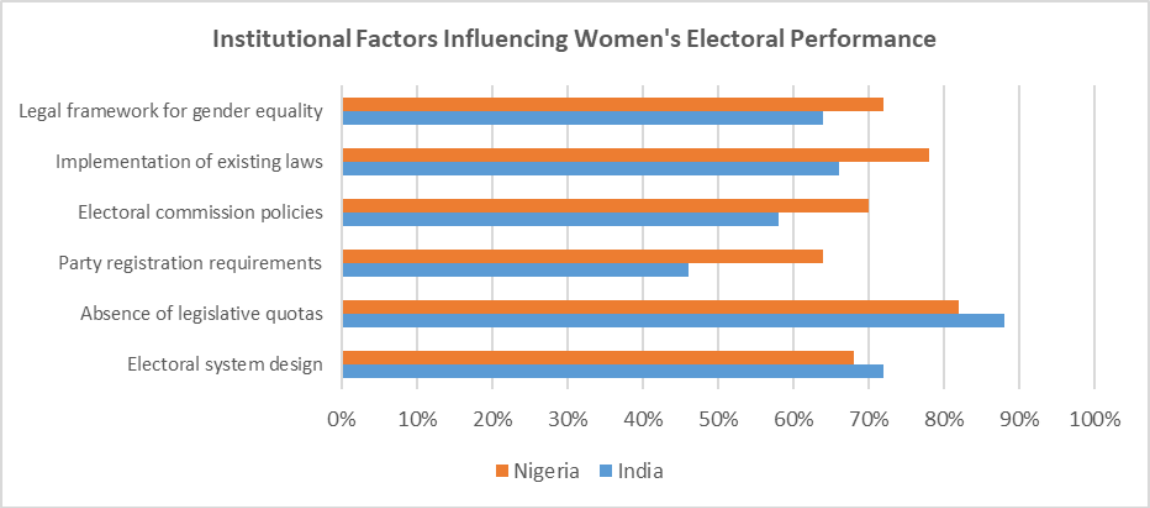

Figure 9. Institutional Factors Influencing Women's Electoral Performance.

Source: Field Work Findings

While no statistically significant differences were observed in the perceived influence of institutional factors between the two countries, respondents in both India (88%) and Nigeria (82%) identified the absence of legislative quotas as a significant factor. Party registration requirements were perceived as more influential in Nigeria (64%) compared to India (46%), though this difference approached but did not reach statistical significance ($p = 0.069$).

Challenges Faced by Women in the 2019 Elections

Challenges Reported by Female Politicians and Candidates

Female politicians and candidates who participated in the study (15 from each country) were explicitly asked about the challenges they faced during the 2019 elections. The findings in Table 11 and Figure 10.

Table 11. Challenges Faced by Female Politicians in the 2019 Elections (% Reporting)

Challenge	India (n=15)	Nigeria (n=15)	Combined (N=30)
Gender-based discrimination	80.0%	93.3%	86.7%
Financial constraints	86.7%	93.3%	90.0%
Balancing family responsibilities	73.3%	80.0%	76.7%
Political violence/intimidation	53.3%	86.7%	70.0%
Limited party support	66.7%	73.3%	70.0%
Media bias	60.0%	66.7%	63.3%
Lack of networking opportunities	53.3%	60.0%	56.7%
Voter prejudice	66.7%	80.0%	73.3%

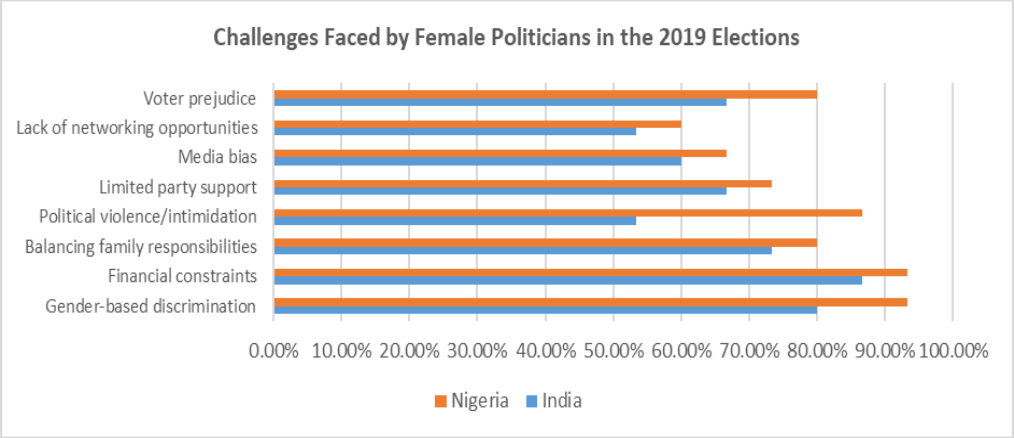

Figure 10. Challenges Faced by Female Politicians in the 2019 Elections

Source: Field Work findings

Financial constraints emerged as the most significant challenge for female politicians in both countries, reported by 86.7% of Indian and 93.3% of Nigerian respondents. Gender-based discrimination was also widely reported, especially in Nigeria (93.3%). Notable differences include the substantially higher reporting of political violence/intimidation in Nigeria (86.7%) compared to India (53.3%), and higher reports of voter prejudice in Nigeria (80.0%) compared to India (66.7%).

Perceptions of Challenges from Different Stakeholder Groups

Perceptions of the challenges women face in politics varied across participant categories. Table 12 presents a comparison of these perceptions.

Table 12. Perceptions of Challenges Faced by Women in Politics (Mean Scores on a Scale of 1-5)

Challenge	Female Politicians	Male Politicians	Party Members	Public	F-Value	p-value
Gender discrimination	4.37	3.20	3.78	3.95	5.63	0.001*
Financial barriers	4.53	3.90	4.25	4.10	2.31	0.082
Family responsibilities	4.10	3.50	3.88	4.15	2.42	0.071
Political violence	3.87	2.60	3.43	3.75	6.18	0.001*
Party support	3.93	3.10	3.48	3.65	3.15	0.029*
Media bias	3.63	2.70	3.05	3.55	4.48	0.006*
Networking limitations	3.43	2.90	3.23	3.25	1.72	0.168
Voter prejudice	3.90	2.80	3.58	3.85	4.94	0.003*

**Statistically significant at $p < 0.05$*

Source: Field Work Findings

The analysis reveals significant differences in perceptions of challenges across different stakeholder groups for gender discrimination, political violence, party support, media bias, and voter prejudice. Female politicians reported higher mean scores than male politicians, indicating a greater perceived severity of these challenges. The perceptions of party members and the public generally fell between these two groups, with the public often aligning more closely with the views of the female politicians.

Variables Contributing to Women's Electoral Performance

Objective 3: To identify the variables contributing to women's electoral performance in the face of male dominance in the political parties.

To assess the relative influence of different factors on women's electoral performance, participants were asked to rank a set of variables in order of importance. The results, presented as mean rankings (lower numbers indicating greater importance), are shown in Table 13 and Figure 11.

Table 13. Ranking of Variables Contributing to Women's Electoral Performance (Mean Rank)

Variable	India	Nigeria	Combined	t-value	p-value
Political party support	2.4	2.7	2.55	-1.06	0.292
Financial resources	2.6	2.3	2.45	1.13	0.261
Educational qualifications	4.5	5.2	4.85	-1.78	0.078
Prior political experience	3.7	4.1	3.90	-1.24	0.218
Family political background	3.3	3.0	3.15	1.05	0.296
Media coverage	4.2	4.6	4.40	-1.33	0.187
Socio-cultural environment	3.1	2.5	2.80	2.02	0.046*
Personal qualities/charisma	4.2	3.6	3.90	1.94	0.055

Source: Field Work Findings

**Statistically significant at $p < 0.05$*

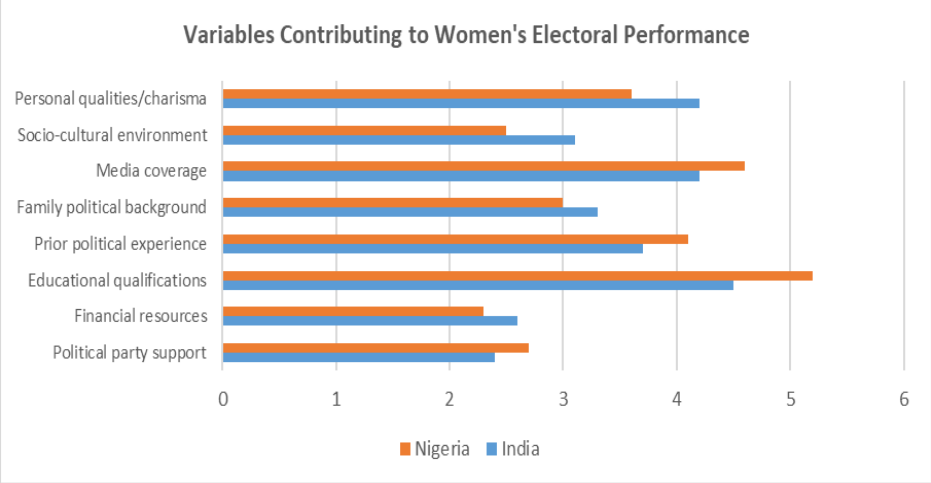

Figure 11. Variables Contributing to Women's Electoral Performance

Source: Field Work Findings

Objective 4: Identify similarities and differences between India's and Nigeria's general elections, political parties' mechanisms, and gender representation in 2019.

In both countries, the FGDs revealed that the type of political party support and financial resources were the most important variables contributing to women's electoral performance, with mean ranks of 2.55 and 2.45, respectively, across the combined sample. The socio-cultural environment was the only variable that showed a statistically significant difference between the two countries ($p = 0.046$), with Nigerian respondents ranking it as more important (mean rank 2.5) than Indian respondents (mean rank 3.1).

Qualitative Analysis of Focused Group Discussions

The focus group discussions (FGDs) with political party members and stakeholders provided rich qualitative data that complemented the quantitative findings. Following the methodology outlined in Chapter Three, content analysis was employed to identify recurring themes, patterns, and insights from these discussions. The analysis was structured around the key dimensions of knowledge, perceptions, rules, and the challenges women face in politics.

Party Decision-Making Processes and Gender Representation

A prominent theme that emerged from the FGDs was the nature of party decision-making processes and their impact on gender representation. Participants highlighted various formal and informal mechanisms that influenced candidate selection and women's participation in party structures. (FGD Participants, India).

In India, participants noted more formalised decision-making processes, with established committees for candidate selection. However, several female politicians noted that even within these formal structures, informal networks often influenced decision-making. As one female politician from India stated:

"The candidate selection committee exists on paper, but the real decisions are made in closed-door meetings dominated by senior male leaders. Women are included in the committee, but our voices are often sidelined."

In contrast, Nigerian participants described more personalised decision-making processes centred around influential individuals within parties. A female politician from Nigeria observed:

"Party decisions are controlled by 'godfathers' who determine who gets nominated. As women, we often lack access to these powerful networks, making it difficult to secure nominations regardless of our qualifications or popularity."

Both countries' participants identified the concentration of financial resources as a critical factor in party decision-making, with those controlling party finances having disproportionate influence over candidate selection. This was seen as particularly disadvantageous to women, who typically had less access to financial resources.

Implementation of Party Rules and Policies

The implementation of party rules and policies regarding gender representation was another key theme from the FGDs. Participants discussed the gap between formal policies and actual practices within political parties. In India, several participants noted that while major parties had adopted voluntary quotas or targets for women's representation, implementation was inconsistent. A party executive from India explained:

"Our party constitution stipulates that women should comprise at least 33% of candidates, but this is treated more as an aspiration than a requirement. When electoral calculations come into play, these commitments are often the first to be sacrificed."

Nigerian participants highlighted similar discrepancies between policy and practice, with the additional observation that party rules were often selectively applied. A female candidate from Nigeria shared:

"The party has rules that should create opportunities for women, but these rules are flexibly interpreted depending on who is involved. Male aspirants often get waivers from requirements that are strictly enforced for women."

Electoral management body stakeholders in both countries acknowledged challenges in enforcing gender-related provisions in party constitutions, given their limited regulatory powers over internal party affairs.

Perceived Effectiveness of Existing Measures

Participants discussed the effectiveness of existing measures to promote women's political participation, revealing varying perspectives across different stakeholder groups.

Participants were asked to rate the potential effectiveness of various measures to enhance women's political representation on a scale of 1 to 5, with higher scores indicating greater perceived effectiveness. The results are presented in Table 13 and Figure 12.

Objective 5: Propose country-specific measures to enhance women's future performance in general elections and recommend areas of future research.

Table 14. Perceived Effectiveness of Measures to Enhance Women's Political Representation (Mean Scores)

Measure	India	Nigeria	Combined	t-value	p-value
Legislative quotas	4.26	4.42	4.34	-0.96	0.339
Reduced nomination fees for women	3.86	4.38	4.12	-3.14	0.002*
Campaign finance reforms	4.04	4.22	4.13	-1.15	0.253
Party quotas	4.18	4.08	4.13	0.66	0.511
Mentoring programs	3.92	3.68	3.80	1.51	0.134
Capacity building for women	4.06	4.00	4.03	0.39	0.697
Media sensitization	3.72	3.84	3.78	-0.78	0.437
Electoral system reforms	3.90	4.12	4.01	-1.44	0.153
Gender-sensitive civic education	3.98	3.96	3.97	0.13	0.897

Source: Field Work Findings

**Statistically significant at $p < 0.05$*

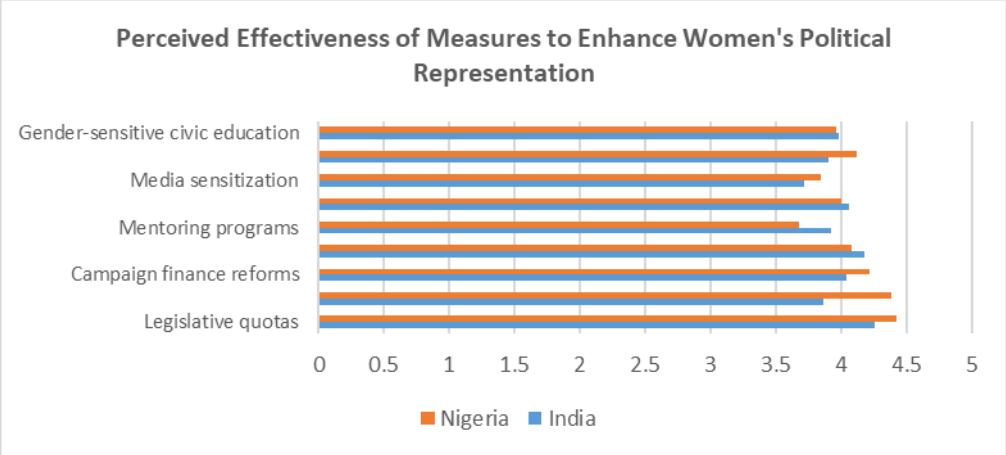

Figure 12. Perceived Effectiveness of Measures to Enhance Women's Political Representation

Source: Field Work Findings

Legislative quotas were perceived as the most effective measure in both countries, with a combined mean score of 4.34. Reduced nomination fees for women showed a statistically significant difference between the two countries ($p = 0.002$), with Nigerian respondents rating this measure as more effective (mean 4.38) compared to Indian respondents (mean 3.86). This aligns with the earlier finding regarding the cost of nomination forms being perceived as a more significant barrier in Nigeria.

Suggested Changes to the Electoral System and Legislation

Participants were asked to suggest specific changes to electoral systems and legislation that could enhance gender representation. The responses were analysed thematically, and the frequency of different themes is presented in Table 15 and Figure 13.

Table 15. Suggested Changes to Electoral System and Legislation (% of Respondents Mentioning)

Suggested Change	India	Nigeria	Combined
Mandatory legislative quotas	84%	78%	81%
Proportional representation elements	42%	36%	39%
Financial incentives for parties	58%	72%	65%
Penalties for non-compliance with gender requirements	46%	64%	55%
Reform of electoral commission practices	38%	52%	45%
Campaign finance regulations	62%	68%	65%
Reform of party registration requirements	28%	44%	36%
Enhanced monitoring and enforcement	52%	60%	56%

Source: Field Work Findings

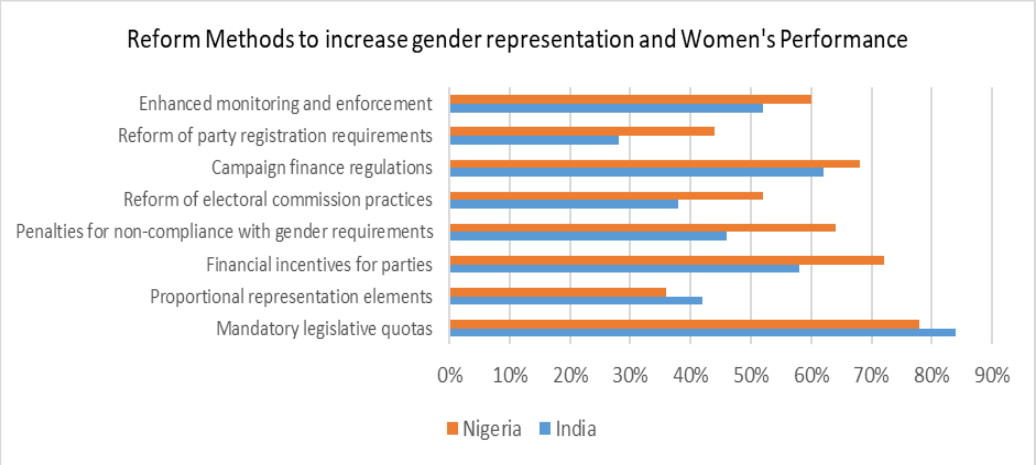

Figure 13. Reform Methods to increase gender representation and performance

Source: Field Work Findings

Mandatory legislative quotas were the most frequently suggested change in both countries (84% in India and 78% in Nigeria). Financial incentives for parties and campaign finance regulations were also commonly suggested in both countries. Notable differences include higher support for penalties for non-compliance with gender requirements in Nigeria (64%) than in India (46%), as well as a greater emphasis on reforming party registration requirements in Nigeria (44%) than in India (28%).

Comparative Analysis of Women's Political Participation in India and Nigeria

Drawing on the findings presented in the previous sections, this section provides a comprehensive comparative analysis of women's political participation in India and Nigeria, focusing on the 2019 general elections. The comparison is structured around key dimensions of gender representation in electoral politics.

Electoral Performance and Representation

The comparative analysis of electoral performance reveals both similarities and notable differences between India and Nigeria. While both countries had similar percentages of female candidates (8.9% in India and 8.0% in Nigeria), the success rates differed significantly. In India, women comprised 14.4% of elected representatives in the lower house, indicating that female candidates were relatively more successful than their male counterparts in securing nominations. In contrast, Nigerian women's representation in the House of Representatives was only 3.1%, suggesting that female candidates faced greater obstacles in translating candidature into electoral success.

This disparity can be attributed to several interconnected factors. First, the more extended history of women's political participation in India, including the experience of a female Prime Minister (Indira Gandhi) and numerous female Chief Ministers, has created more favourable conditions for women's electoral success. Second, as indicated by the data on party support and institutional measures, Indian political parties appeared to provide more substantive backing to female candidates after they were nominated. Third, the reservation system for women in local governance in India has created a pipeline of experienced female politicians, some of whom have successfully contested national elections.

Institutional and Structural Factors

The institutional and structural landscape for women's political participation varied significantly between the two countries. India's constitutional framework, which includes reserved seats for women in local governance (33% in Panchayati Raj Institutions), has created a foundation for women's political engagement that is absent in Nigeria. This institutional difference was reflected in participants' awareness of special provisions for women in politics, which was significantly higher in India (86%) compared to Nigeria (52%).

Electoral systems in both countries, characterised by first-past-the-post in single-member constituencies, were identified as disadvantageous to women's representation. However, the implementation of these systems within different socio-political contexts has led to varying outcomes. The stronger institutional capacity of India's Election Commission, reflected in the higher ratings of its implementation of gender-neutral principles, has contributed to a more level playing field compared to Nigeria.

Party structures and nomination processes also revealed significant differences. While both countries' political parties remained male-dominated, Indian parties demonstrated more formalised mechanisms for women's inclusion, including women's wings with substantial organisational presence and, in some cases, voluntary quotas. Nigerian parties, by contrast, showed more personalised, patronage-based nomination processes, which were identified as particularly disadvantageous to women with less access to influential networks.

Socio-cultural Context

The socio-cultural context influencing women's political participation showed both everyday challenges and country-specific variations. Patriarchal social norms and traditional gender roles were identified as significant barriers in both countries, with no statistically significant differences in their perceived influence. However, religious factors were perceived as significantly more influential in Nigeria (84%) than in India (56%), reflecting a stronger role of religious considerations in Nigerian politics, particularly in the northern regions.

Gender-based violence and intimidation also showed significant differences, with higher reporting in Nigeria (82%) compared to India (58%). This aligns with the experiences shared by female politicians during the focus group

discussions, where Nigerian women reported more severe forms of harassment and intimidation during their campaigns.

The media portrayal of female politicians was identified as a challenge in both countries, though with slightly different manifestations. In India, participants noted stereotypical portrayals focused on women's appearance and family connections rather than their policies or capabilities. In Nigeria, participants highlighted both stereotypical portrayals and insufficient coverage of female candidates, rendering them less visible to voters.

Economic Factors

Economic barriers to women's political participation showed similar patterns in both countries, with campaign financing difficulties and limited access to economic resources identified as significant challenges. However, the specific manifestations of these barriers varied. In Nigeria, the high cost of nomination form fees was identified as a significant barrier (88%), compared with India (62%), reflecting differences in party practices regarding nomination fees. An example from the All Progressives Party (APC) in Nigeria is highlighted in Table 16.

Table 16. The Peoples' Democratic Party (PDP) 2019 Expression of Interest and Nomination Fees.

	Position	**Expression of Interest Fee ($)**	**Nomination Fee ($)**
1	President	1,300	13,403
2	Governor	670	6,700
3	Senate	268	2,680
4	House of Representatives	268	1,340
5	State House of Assembly	134	670

Using exchange rate $1 = ₦1490

Source: Field Work Findings INEC, Nigeria

N.B.: Though the female nomination form was free, they, however, paid for the Expression of Interest form as shown in Tables 17 and 18

Table 17. All Progressive Congress (APC) 2019 Expression of Interest and Nomination Form Fees

	Position	**Nomination Form for Incumbent ($)**	**Nomination Form for Fresh Aspirants ($)**
1	President	26,806	13,500
2	Governor	7,037	3,686
3	Senate	3,552	2,211
4	House of Representatives	2,144	1,474
5	State House of Assembly	536	368

Table 18. All Progressives Congress APC 2019 Expression of Interest and Nomination Fees

	Position	**Expression of Interest Fee ($)**	**Nomination Form Fee ($)**
1	President	N/A	N/A
2	Governor	1,340	6,701
3	Senate	335	2,010
4	House of Representatives	335	1,340
5	State House of Assembly	134	670

Using exchange rate $1 = ₦149

Source: Field Work Findings INEC, Nigeria

N.B. Female Aspirants were made to Pay only 50 per Cent of the fees for the Nomination Forms

Maximum Limits in Campaign Spending in Nigeria are as follows:

1. A Presidential Candidate can spend $670,500.
2. A Senatorial Candidate can spend $26,800.
3. A House of Representatives candidate can spend $13,400.
4. Candidates for the State House of Assembly can spend $6,700.
5. Chairmanship election to an Area Council, $6,700.
6. A councillorship candidate can spend a maximum amount of $670.

Dependency on male sponsors was reported at higher levels in Nigeria (84%) than in India (70%), indicating greater financial autonomy among female politicians in India. This may be linked to broader economic factors, including higher female labour force participation in India and more established financial support mechanisms within Indian political parties.

Discussion of Key Findings

This chapter has presented a comprehensive analysis of political parties, elections, and gender representation in India and Nigeria, with a specific focus on women's performance in the 2019 general elections. The key findings can be summarised as follows:

1. Electoral Performance: While both countries had similar percentages of female candidates (approximately 8-9%), their electoral success varied significantly, with women constituting 14.4% of elected representatives in India's Lok Sabha compared to just 3.1% in Nigeria's House of Representatives.
2. Voter Participation: India demonstrated gender parity in voter turnout, with female turnout (67.2%) slightly exceeding male turnout (67.0%) in 2019. Nigeria exhibited lower overall voter participation, with a small gender gap: male turnout (35.6%) was slightly higher than female turnout (34.8%).
3. Perceptions of Women's Participation: Participants' perceptions of women's political participation varied significantly between the two countries, with India receiving a mean rating of 6.2 out of 10 compared to Nigeria's 3.7 out of 10.
4. Political Party Dynamics: Women's representation in party executive positions was higher in India (16.1%) compared to Nigeria (10.7%). Candidate selection processes were identified as the most significant party-related factor influencing women's electoral performance in both countries.
5. Socio-cultural Factors: Patriarchal social norms and traditional gender roles were perceived as highly influential in both

countries. Religious factors and gender-based violence/intimidation were perceived as significantly more influential in Nigeria compared to India.

6. Economic Barriers: Campaign financing difficulties and limited access to economic resources were identified as significant barriers in both countries. The cost of nomination forms was perceived as a significantly greater barrier in Nigeria compared to India.
7. Institutional Factors: The absence of legislative quotas at the national level was identified as a significant institutional barrier in both countries. India's reservation system for women in local governance provided a foundation for women's political engagement that was absent in Nigeria.
8. Challenges Faced by Female Politicians: Financial constraints were the most significant challenge reported by female politicians in both countries. Nigerian female politicians reported higher levels of gender-based discrimination, political violence/intimidation, and voter prejudice compared to their Indian counterparts.
9. Effectiveness of Measures: Legislative quotas were perceived as the most effective measure to enhance women's political representation in both countries. Reduced nomination fees for women were rated as significantly more effective by Nigerian respondents compared to those in India.
10. Suggested Changes: Mandatory legislative quotas and FGD participants suggested literacy programs on elections were the most frequently mentioned to enhance women's political representation in both countries. Nigerian respondents placed greater emphasis on penalties for non-compliance with quota requirements and on reforming party registration requirements than Indian respondents.
11. Efforts to achieve universal literacy must be intensified. This was emphasised during the Focus Group Discussion (FGD); the only way to do so is to narrow the variation in literacy levels across genders, social groups, and regions. In recent years, India has adopted a broader understanding of literacy.
12. Dropout rates among female learners at all levels of schooling, particularly at the secondary level, are a concerning trend. A 2018 World Bank report states that globally, nine out of ten girls complete their primary education (up to class 5). However, the numbers dwindle at subsequent stages in a girl's educational trajectory, as shown in Figure 14 below.

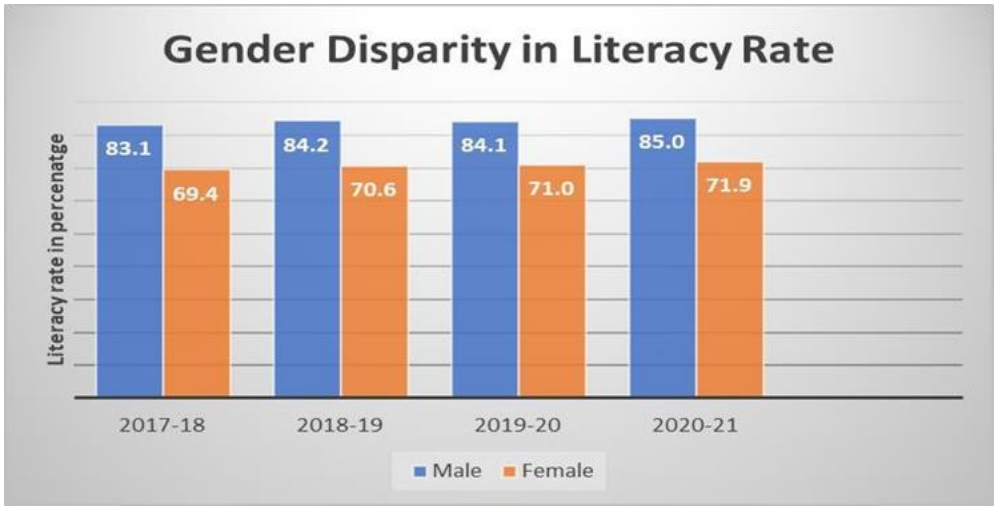

Figure 14. Gender Disparity in Literacy Rate.

Source: Field Work Findings from the IEC office, India

Summary of Findings and Contribution to Knowledge

This research highlights key factors influencing women's political roles in India and Nigeria. Legislative quotas are viewed as most effective, with a mean score of 4.34 out of 5. Nigerian respondents see reduced nomination fees as more impactful than Indian respondents, reflecting cost barriers. Campaign finance reforms and party quotas are also valued, indicating the need for diverse strategies to address gender disparities. These insights help inform targeted efforts to boost women's political participation and representation in both countries.

Conclusion

This study compares women's performance in the 2019 elections in India and Nigeria, revealing how political, institutional, socio-cultural, and economic factors influence gender representation in these contexts. It highlights similarities and differences in perceptions and their impact on women's political participation, offering insights into the challenges and opportunities for achieving gender equality in democratic systems.

Electoral performance indicates that women are underrepresented in India and Nigeria, with India making more progress due to its distinct political context. However, this research is akin to Acemoglu and Robinson's [28] research on "Why Nations Fail," which suggests that electoral patterns alone do not benefit marginalised groups without strong institutions and is recommended for further research. Secondly, this study complements the various assumptions highlighted. For example, it suggests that women's experiences vary by life stage and are influenced by biological, social, and economic factors, such as the gender wealth gap, the political elites gap among women, and the caregiving role. Harold Laswell, in the book Politics: "Who Gets What and When", discussed the types of negotiation and building resources, structures such as political parties, which are difficult to establish. While deep-rooted bias, policy neglect, and economic disparities hinder progress for women. Improving women's status in India requires a multifaceted approach. Closing the gender gap also needs bold, comprehensive actions [29].

Since 2017, the UN Human Development Index has reported that nations such as Bulgaria, France, Slovenia, and Sweden have achieved fully gender-balanced governments. Countries where women hold over one-third of ministerial roles include Finland, Germany, the Netherlands, Norway, Romania, and the UK. Croatia, Greece, Hungary, and Latvia ranked below the US in parliamentary representation, having taken fewer bold steps. These lessons from the Atlantic region can inspire global progress, but data gaps in Asia and Africa require further research. Limitations caused by patriarchal norms of male superiority in governance have led to a cartel of male political elites restricting women's participation in these regions. Promoting gender equality through government initiatives is essential. The study identified new limitations for further research, including the overgeneralization of women's family roles, patriarchal influence in governance, a lack of partnership and effective networking with relevant parties to promote female candidacies or manifestos, the absence of media pressure, and a lack of awareness of pathways beyond quotas. Arent Liphart found that proportional representation encourages more women's participation and stimulates further debate, requiring more data to improve women's representation.

Recommendations

Based on the findings of this research, the following recommendations are proposed to enhance women's political representation in India and Nigeria:

For Legislative Bodies and Governments

1. Implement Legislative Quotas and Reform Electoral Systems: Consider modifications to the first-past-the-post electoral system, such as introducing proportional representation through quota elements that have been shown to increase women's representation globally.
2. Reduce Financial Barriers: Establish campaign finance regulations that limit expenditure and provide public funding for campaigns, with specific allocations for female candidates. In Nigeria, particularly, consider reducing nomination fees for women candidates or providing fee waivers. Others include the following:
3. Strengthen Enforcement of Existing Policies to address Political Violence.

For Electoral Management Bodies

Implement gender-responsive policies across all electoral processes, from voter registration to polling. Enhance data collection by publishing gender-disaggregated electoral data to support evidence-based policies and monitor progress. Conduct gender compliance training for electoral officials to ensure fair treatment of female candidates and voters.

For Political Parties

1. Internal Party Quotas: Implement voluntary party quotas for women candidates, aiming for a minimum of 33% female representation in candidate lists for all elections.
2. Transparent Nomination Processes: Establish clear, transparent, and merit-based nomination processes that minimise the influence of informal networks and patronage systems that disadvantage women.
3. Financial Support Mechanisms: Create dedicated funds to support female candidates' campaigns and reduce their dependency on male sponsors or personal finances.
4. Capacity Building Programs: Develop comprehensive mentoring and capacity-building programs for female party members, focusing on developing both political skills and financial literacy for campaign management.
5. Reform Party Structures: Review and reform party constitutions and structures to ensure women's meaningful participation in decision-making processes, including representation in executive committees and leadership positions.

For Civil Society Organisations

Advocacy Campaigns: Engage Male Allies and media from the bottom up to conduct public advocacy campaigns to challenge stereotypes about women's leadership capabilities, to promote the importance of gender-balanced political representation, with support measures at the regional and federal levels to address mentoring, psychological support, and gender-based discrimination and violence.

Implications for Future Research

This study has provided valuable insights into women's political representation in India and Nigeria, while also highlighting several areas that warrant further investigation. Further research is needed on the impact of quotas across government levels, voter attitudes, policy implementation, media representation, and the influence of international gender equality norms. These studies, if conducted, would help understand the global and local factors that shape and enhance women's political performance, as suggested by the prerequisite training highlighted in Figure 15 below.

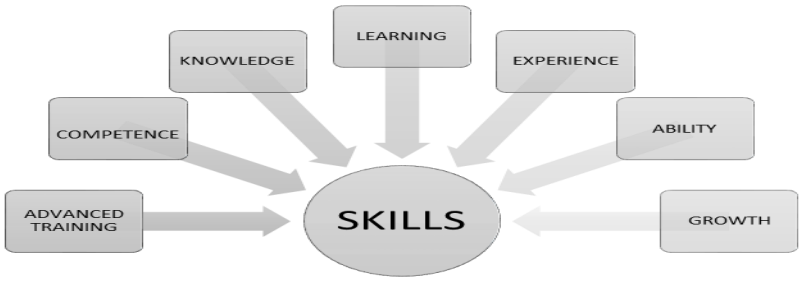

Figure 15. Women's Training Panacea

Source: Author's Designed Framework.

The skills listed above are vital for adapting to social norms and economic changes. Arent Lijphart's interpretation of "Consociational" power-sharing theory is in the context of capability theory, which was adopted by the "cartel of elites" to guide the stages of the political process for development. The UN defined four stages of women's empowerment, which include equal access to all types of resources for women as for men. Conscientisation means women becoming aware of their inequalities and opportunities. Action involves women enhancing their participation through various development tasks, including achieving equity for fair access to resources, control over those resources, and full participation in decision-making and agenda-setting processes that meet their needs [33].

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Data Availability

1. I can confirm that the data of the participants has been kept secure, as agreed, and will not be shared due to the enhancement of data privacy and security for individuals, and this was agreed with the participants.
2. I have the list of participants from the two countries, which can be shared in anonymity if required.

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Conflict of Interest

The researcher affirms the absence of any conflicts of interest in the investigation, examination, and dissemination of this article, as a Ph.D. student in the political science department at Texila University, this article is part of the requirements to obtain a Ph.D. degree; thus, the study has been performed with complete objectivity and ethical standards, and no monetary or non-monetary motives have

impacted the outcomes, evaluations, or deductions discussed in this manuscript.

My dedication is exclusively towards attaining academic excellence and scientific accuracy while investigating the legitimacy of electoral processes and gender representation within the mentioned nations, as part of my academic requirements.

References

[1]. World Bank Demography Report 2022, In the Next Generation Population List, World Bank, Washington, DC. Retrieved July 15, 2024.

[2]. Racheal, E., Brule, 2020, Women, Power, and Property: The Paradox of Gender Equity Laws in India. *Cambridge University Press*, Boston.

[3]. Pry, K., 2012, Social and Political Roles of Women in Athens and Sparta. *Sabre and Scroll*,

[4]. Nigeria Independent National Electoral Commission (INEC) 2019, Electoral Act Report. Retrieved from https://www.inecnigeria.org/electionreports 2019

[5]. Inter-Parliamentary Union (IPU), 2019, Gender Quotas Database: Monthly Ranking of Women in the World Parliament. Retrieved from http://www.ipu.org

[6]. Inter-Parliamentary Union (IPU), 2019, Gender Quotas Database: Monthly Ranking of Women in the World Parliament. Retrieved from http://www.ipu.org Carnegie International Observer Report. Indian elections 2019-2024: Gender dynamics. Washington: Carnegie Endowment; 2023.

[7]. Racheal E. Brule 2020, Women, Power, and Property: The Paradox of Gender Equity Laws in India. *Cambridge University Press*,

[8]. Carnegie International Observer Report, on Nigeria Elections 2019, Washington: Carnegie Endowment; 2023.

[9]. Michealina, J., 2018, Review of Lijphart Arendt's Theory of Consociationalism and Power Sharing in Europe. In The Theory of Political Accommodation, (eds) by D. Kuzu and Matt Qvortrup; Cham: Palgrave Macmillan, *Journal on Ethno-politics and Minority Issues in Europe*, 17(2): pp 77-75.

[10]. Awe, B., 2020, Women in Nigeria, *In the Journal of African History*. Oxford University Research. Retrieved from http://www.idpublications.org

[11]. Antonio, Guterres, 2022., Forum Report on Gender Equality and UN Secretary General Remarks at the European Institute for Gender Equality (EIGE); UN-Department of Economic and Social Affairs (UNDESA) Remarks on the Commission on the Status of Women (Accessed: 8 September 2023).

[12]. Indian Constitution, Retrieved from Election Commission of India (ECI) 2019 Data Report. Retrieved from https://www.eci.gov.in/candidate-political participation.

[13]. Nigeria's 1999 Constitutional Language Review Conference Report. 2022, Chapter V Section 42 (1) 43 (2). *UN Office Abuja*, Nigeria

[14]. Aina, O., 2012, The review of the 1999 Nigerian Constitution, specifically sections 65, 66, 106, 107, 131, 137, 177, and 187 (Procedures for Party Nominations), was conducted by the members of the Committee of Nigeria. Abuja, Nigeria

[15]. Bassey, E. E., 2018, Female representation and objectification in Zulu Sofola's: The Sweet Trap: Critical Perspectives on Female Nigerian Writers. Lagos, Nigeria.

[16]. United Nations Development Fund for Women (UNIFEM 2019;2009); Conference Report on Harmonised Approaches to Promoting Gender Equality in a Fragile Environment: Donor Effectiveness, Global Messages and Country Experiences held in Zimbabwe, UNIFEM

[17]. Malhotra, I., 2019, India Today: In a Global Dialogue on Federalism. *Book Review*, Volume I, No. 185. *McGill-Queen's University Press*. Montreal & Kingston Centres for Federal Studies, India. ISBN 0-77352849, pp. 180-207.

[18]. Bolanle, A., 2017, Nigerian Women and the Quest for Gender Integration; Conference Paper, 2-5 http//www.proshareng.com

[19]. Sule, B., Adamu, U., and Sambo, U., 2020, The 2019 general election in Nigeria: Examining the

issues, challenges, successes and lessons for future general elections. *International Journal of Social Sciences Perspectives*, *6*(2), pp.100-113.

[20]. UNIFEM: Nigeria Gender Policy Review Committee Report. 2019, Millennium Development Goals (MDG) Programs Evaluation Session, accessed July 3, 2025. www.millenniumdevelopmentgoals.net.nig

[21]. Carnegie International Observer Report on Nigeria Elections 2019, Washington: Carnegie Endowment; 2023.

[22]. Salini, S., 2017, "Protection Of Women Under the Indian Constitution". Buddy-Mantra. Archived from the original on 1 October 2023. Retrieved 4 September

[23]. Onuoha, F. C., and Ojo, J., 2018, In "Politics Today": The Practice and Perils of Vote Buying in Nigeria's Recent Elections. *Conflict Trends Journal*, 2018, (3), pp.21-29.

[24]. INEC Nigeria, 2019, Review of the 2019 Election Assessment in Nigeria. Retrieved from - Annual Report. https://www.nbs.gov.ng/electionreports2019/inec, Abuja, Nigeria.

[25]. World Comparative Study Report. 2021, Global data on Women in National Parliaments. Inter-Parliamentary Union (IPU). Retrieved from https://www.ipu.org/2021

[26]. IDEA 2019: Comparing Election Evaluation reports in Nigeria, IDEA-Nigeria, Abuja, Accessed online 2023 www.idea.org

[27]. Election Commission of India (ECI), 2019, Election Data Report. Retrieved June 30, 2025, online https://www.eci.gov.

[28]. Daron Acemoglu and James A. Robinson, eds. (2012;2023) The Origin of Power-Why Nations Fail, Profile Books Ltd, University of Michigan, ISBN 9781846684302.Internet Archive, https//achieve.org.pdf

[29]. Harold D Laswell, 2018, Politics Who Gets What, When, How, ebook 2nd edition, *Papamoa Press*, ISBN:9781789235573

[30]. United Nations Human Development Annual Index Report 2021, retrieved from Global Impact Index (GII) UN Report. https//www.undp.org pp21-34

[31]. Arend, Lijphart, 1969, Consociational Democracy in World Politics 21 (2): 205-19. http://www.jstor.org/stable/2009820

[32]. Chimamanda, N., 2024, Feminist Manifestos; Dogan Yayinlari, ISBN: 9786256198432,6256198433, World of Book.com; e-book USA.

[33]. Garuba Daudu, and Aderemi, Adewale (ed.) (2022/2023) A Study on Inclusive Practices in Political Parties. *Westminster Foundation for Democracy* (WFD), UK, and NILDS, Abuja, FCT.

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Exploring the Interconnection between Climate Change and Public Health in Humanitarian Crises- A Case Study of Syria

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Abstract

The intersection of climate change and public health is increasingly critical in humanitarian settings. Syria exemplifies a complex context where prolonged conflict, environmental degradation, and climate-related shocks converge to severely impact health systems and vulnerable populations. To examine how climate change exacerbates public health challenges during humanitarian crises in Syria, with a focus on systemic vulnerabilities, health outcomes, and potential adaptation strategies. This analysis synthesizes findings from literature, field data, and case studies in Syria to assess the compounded effects of climate change on public health. It applies to a systems-thinking framework to explore health infrastructure, governance, and community-level resilience. Climate change intensifies public health risks by increasing water scarcity, food insecurity, disease outbreaks, and heat-related illnesses. Vulnerable populations, including children, women, and the elderly, face disproportionate health burdens. Conflict-related infrastructure damage and fragmented health systems further hinder effective response. Mental health impacts are profound and under-addressed. Addressing the climate-health-humanitarian nexus in Syria requires integrated strategies that strengthen local health systems, invest in resilient infrastructure, and incorporate climate risk into health planning. Collaborative, multi-sectoral action is essential to mitigate future crises and protect public health in conflict-affected, climate-vulnerable regions.

Keywords: *Adaptation Strategies, Climate Change, Health Systems, Humanitarian Crisis, Public Health, Syria.*

Introduction

Climate change represents one of the most pressing global health threats of the 21st century, intensifying the frequency and severity of humanitarian crises [1]. In vulnerable regions already affected by conflict, poverty, or fragile health systems, the intersection of climate change and public health can result in compounded challenges [16]. Syria exemplifies such a context, where years of civil war, environmental degradation, and climate-induced stressors have converged to create one of the most complex humanitarian crises in recent history [17].

This paper explores how climate change exacerbates public health vulnerabilities in Syria's humanitarian context. It examines the pathways through which climate-induced hazards such as extreme heat, water scarcity, and food insecurity interact with ongoing conflict and institutional breakdown to worsen health outcomes [19]. By integrating a systems-thinking approach and analysing case-specific data, the study aims to understand the compounded effects on health infrastructure, disease burden, and community resilience. Special attention is given to the most vulnerable groups, including children, the elderly, and internally displaced persons (IDPs), who face disproportionate risks [12].

The paper underscores the urgent need to embed climate resilience into health planning

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and humanitarian action [15]. It argues that only by recognizing and responding to the climate-health-humanitarian nexus can sustainable and equitable solutions be developed to address the evolving challenges in Syria and similar fragile settings.

Methods

This study adopts a mixed-methods approach, utilizing:

1. Literature review of peer-reviewed articles, humanitarian reports, and climate data sources [9, 11].
2. Case studies (e.g., Aleppo and Idlib) to provide ground-level insight [2, 6].
3. Synthesis of secondary data (e.g., WHO, IPCC, UNICEF) using a systems-thinking framework [18].
4. Spatial and temporal assessments through available observation points, GIS references, and community-level assessments in NWS Syria [21].

Results

The main findings show:

1. Increased disease burden linked to water and air pollution, malnutrition, heat stress, and conflict-related trauma [22].
2. Disruption of health services through conflict and climate-induced degradation [8].
3. Chronic vulnerabilities among children, women, the elderly, and displaced communities [12].
4. Mental health crisis due to war and ecological stressors [15].
5. Breakdown of infrastructure (e.g., water chlorination, electricity, waste systems) [17].
6. Efforts made by local NGOs and international actors to mitigate these issues remain fragmented and underfunded.

Discussion

Climate change amplifies existing vulnerabilities in humanitarian settings [23]. Public health systems in Syria are structurally weakened, and insufficient adaptation policies exacerbate this [21]. Vulnerable populations bear a disproportionate burden due to limited access to essential services. Mental health, though less visible, poses a profound challenge that requires greater policy attention. Resilience-building and integration of climate considerations into humanitarian health responses are crucial [26].

Background on Climate Change

Climate change (CC) is directly or indirectly attributed to human activity that alters the composition of the global atmosphere and leads to changes in climate on a given time scale [10]. Scientific reports assert that continuing CC will undoubtedly lead to global-scale crises with profound effects on public health. These crises include permafrost thawing, glacier melting leading to flooding, coastal towns' flooding because of sea-level rise, and severe flooding in rivers and lakes' watersheds leading to habitat destruction and displacement of human habitats [10].

CC, through extreme weather events (heat waves, floods, storms, droughts) and chronic climate events (long-lasting droughts, rising average temperature), exacerbates existing health challenges related to water and food insecurity, vector-borne infectious diseases, population displacement, and mental health issues. Moreover, the indirect effects of CC compromise human security and economic growth, further increasing vulnerability, especially of poorer populations who are least responsible for greenhouse gas emissions [11]. Humanitarian organisations are increasingly aware that CC is a game-changer for vulnerable communities and humanitarian action.

Overview of Public Health in Syria

The population of Syria is estimated at 17.5 million, with significant demographic diversity across urban and rural regions. Pre-crisis, the epidemiological pattern of disease included a dual burden of communicable and non-

communicable diseases, alongside a substantial trauma burden related to traffic accidents, workplace injuries, and limited occupational safety enforcement [2, 6]. Syria had begun making progress in reducing infectious diseases through widespread vaccination programs, improved sanitation infrastructure, and expansion of maternal and child health services. Simultaneously, lifestyle changes, urbanization, and increased tobacco use have led to a rise in chronic conditions such as cardiovascular disease, diabetes, and cancer [11]. Trauma-related health issues, both accidental and violence-related, already formed a key part of the country's health profile before the onset of conflict.

The National Health Information Centre, operating under the Ministry of Health, served as the hub for data management and surveillance. It provided regular health bulletins and maintained a centralised epidemiological reporting system. This system, although limited in transparency and reliant on vertical chains of reporting, allowed for a relatively structured health monitoring framework compared to many neighbouring states. Data collectors were employed by the Ministry and affiliated agencies, ensuring the routine collection of morbidity and mortality statistics. These datasets, despite their limitations, enabled planning for immunization campaigns, outbreak response, and health workforce deployment [21].

Before the war, Syria's health system was regarded as one of the strongest in the Middle East [6, 12]. The public sector provided subsidised health services, particularly in primary and secondary care. Health infrastructure included a dense network of primary health centres, general hospitals, and specialized referral institutions in larger cities such as Damascus, Aleppo, Homs, and Latakia. The private health sector was also expanding rapidly, catering to wealthier urban populations and offering services such as specialised surgeries, advanced diagnostics, and elective care. Public health coverage was relatively robust compared to the regional average, and Syria was making incremental gains toward universal health coverage [15].

Despite these strengths, persistent inequities remained. Rural populations, particularly in the northeast and southern governorates, had weaker access to health facilities and trained staff [16]. Disparities were also observed among vulnerable groups, including refugees, seasonal agricultural workers, and marginalised ethnic minorities. Preventive care and continuity of care were uneven, with maternal health and chronic disease management lagging behind international standards.

The onset of war in 2011 shattered this fragile progress. The health system is fragmented into two broad structures: one under the control of the Ministry of Health in government-held areas, and another emerging in opposition-controlled territories through NGOs, local councils, and alternative governance structures [21]. Both systems struggled with dire shortages of supplies, an exodus of trained medical professionals, and attacks on health facilities that eroded trust and functionality. The politicization of aid further complicated service delivery, with assistance often distributed along political and territorial lines rather than based on humanitarian need [18].

Over time, what had once been a relatively integrated national health system became a patchwork of disconnected, resource-strapped networks. International humanitarian agencies stepped in to fill gaps, but coordination was inconsistent and heavily constrained by access restrictions, insecurity, and fluctuating donor commitments [14]. This fragmentation not only undermined service delivery but also crippled national health governance, leaving millions without reliable access to essential care.

The destruction of health facilities and infrastructure further widened gaps in access. More than 50% of hospitals and primary healthcare centres have been reported as either

entirely destroyed or partially damaged since the beginning of the conflict [19]. Essential health services such as maternal care, vaccinations, and surgical capacity have become highly inconsistent, and this has had intergenerational consequences for maternal and child health outcomes. Additionally, the outflow of health professionals, many of whom fled violence or emigrated to pursue safer livelihoods abroad, has left severe shortages of qualified doctors, nurses, and technicians. This "brain drain" effect means that even where facilities exist, they often lack the staff needed to operate at full capacity [22].

Public health in Syria today exists in a state of chronic crisis management, marked by collapsing infrastructure, fragmented governance, and overreliance on international humanitarian assistance. The erosion of preventive care programs, including immunization and communicable disease control, has created fertile ground for outbreaks of measles, polio, and cholera [17]. Chronic conditions, once increasingly manageable pre-crisis, are now underdiagnosed and undertreated, contributing to long-term health deterioration. Without a stable health governance framework, the population's health is likely to remain precarious for the foreseeable future.

Humanitarian Crises in Syria

Syria's civil war, now in its second decade, remains one of the most devastating humanitarian crises in modern history. The conflict has displaced more than half the population, with nearly 6 million seeking refuge abroad and another 6.7 million internally displaced [2, 12]. Beyond the immediate violence, the crisis has systematically dismantled essential health, water, and food systems. Hospitals have been bombed, medical workers targeted, and medicines rendered scarce due to disrupted supply chains [6]. These acts are not collateral consequences but represent a broader strategy of war, where denial of health services has been used as a weapon of control.

The COVID-19 pandemic further exposed the fragility of what remains of the health system. Overcrowded camps and besieged urban settlements lacked testing capacity, ventilators, and vaccination coverage. International humanitarian agencies attempted to intervene, but access restrictions, politicization of aid, and donor fatigue limited their effectiveness [15]. The compounded effect of conflict, pandemic, and institutional breakdown has created a near-permanent state of emergency.

Climate change has added a profound new dimension to the crisis. Prolonged droughts have undermined agriculture in the northeast, exacerbating food insecurity in a region already dependent on aid. Flash floods have damaged informal displacement camps, while heatwaves have worsened health risks for children, the elderly, and people with chronic conditions. These shocks interact with existing vulnerabilities: displaced families dependent on fragile humanitarian pipelines often face a cycle of repeated loss, where each climate-related hazard deepens displacement, erodes resilience, and heightens dependency on external aid [17, 21].

In this sense, Syria illustrates the *climate–conflict–health nexus*: conflict generates immediate destruction, climate hazards amplify existing fragility, and both combine to create chronic humanitarian need. The Syrian case also underscores a wider lesson for humanitarian actors responses cannot remain siloed between conflict relief and climate adaptation; both must be integrated to address cascading risks.

Collapse of Basic Services

The war has devastated essential infrastructure and public services. Water systems have been deliberately targeted or neglected, leaving millions without access to clean and safe drinking water [6]. Sewage

treatment plants and waste management systems have collapsed in many areas, contributing to outbreaks of waterborne diseases such as cholera and typhoid. Hospitals and health facilities have been systematically bombed, with over 70% of Syria's health workforce displaced or killed. Medicines, once relatively accessible, are now scarce, and supply chains for insulin, antibiotics, chemotherapy drugs, and maternal health supplies have been disrupted. The COVID-19 pandemic further exposed these fragilities, overwhelming what remained of the health system and making even basic care inaccessible for large segments of the population.

Education systems have also collapsed, with schools destroyed, occupied by armed groups, or converted into shelters for displaced families. An entire generation of Syrian children faces the prospect of growing up without adequate education, creating long-term implications for human capital and stability.

Displacement and Refugee Burden

Internally displaced persons (IDPs) are among the most vulnerable groups. Families live in overcrowded camps or informal settlements with little protection from the elements. Tents offer limited insulation against freezing winters and scorching summers, conditions that climate change is intensifying. Refugee camps in Idlib and Aleppo governorates are particularly overcrowded, with poor sanitation, limited water supplies, and inadequate healthcare. Women and girls face heightened risks of gender-based violence, while children are exposed to child labour, early marriage, and recruitment by armed groups.

Host countries, particularly Turkey, Lebanon, and Jordan, have struggled to accommodate millions of Syrian refugees. Turkey hosts more than 3.5 million, the largest refugee population in the world, while Lebanon's refugee population constitutes nearly a quarter of its residents, straining already fragile political and economic systems. Host communities experience mounting tensions, competition over jobs and resources, and pressure on housing, education, and health services.

Climate Change as a Conflict Multiplier

The crisis is compounded by climate change, which acts as a "threat multiplier." Prolonged droughts in the years preceding the conflict devastated agricultural livelihoods, fueling rural-urban migration and social unrest. Since the conflict began, climate-related shocks have only worsened vulnerabilities. Prolonged droughts strain fragile food systems, reducing crop yields and increasing reliance on humanitarian food aid. Flash floods, increasingly common due to erratic rainfall patterns, have repeatedly damaged IDP camps, washing away tents, contaminating water supplies, and spreading disease. Heatwaves worsen health outcomes for populations living in poorly ventilated shelters and lacking access to cooling mechanisms.

Food insecurity has become chronic. According to the World Food Programme, over 12 million Syrians are now food insecure, with families surviving on reduced meals and nutritionally inadequate diets. Rising food prices driven by global shocks, the war in Ukraine, and disrupted domestic production have pushed families deeper into poverty. Climate-related crop failures exacerbate this, forcing greater reliance on imports and aid at a time of shrinking donor budgets.

Humanitarian Access and Aid Challenges

Humanitarian access remains a critical challenge. Insecurity, bureaucratic hurdles, and political manipulation frequently obstruct aid delivery. Cross-border aid into northwest Syria has been subject to contentious negotiations in the UN Security Council, with periodic threats of vetoes undermining the predictability of assistance. Within government-controlled

areas, humanitarian agencies face restrictions and surveillance, limiting their ability to reach populations impartially.

Funding shortfalls add another layer of difficulty. The Syria Humanitarian Response Plan is consistently underfunded, with health, WASH (water, sanitation, and hygiene), and protection sectors receiving less than half of the requested funding. Donor fatigue, competing global crises (such as Ukraine, Yemen, and climate disasters elsewhere), and political reluctance have all reduced international commitment. As a result, lifesaving interventions, including immunization campaigns, maternal health programs, and food assistance, are scaled back, leaving millions at risk.

Regional and Global Implications

The Syrian crisis has significant spillover effects beyond its borders. Neighbouring states struggle with economic and social pressures, and Europe continues to grapple with the political consequences of the 2015–2016 refugee influx. Protracted displacement has also created a "lost generation" of Syrians, raising concerns about future instability, radicalization, and long-term dependence on aid. Climate change threatens to further destabilize the region, as resource scarcity, migration pressures, and extreme weather events interact with existing political fragilities.

At the global level, Syria serves as a stark example of how conflict, climate change, and weak governance intersect to produce protracted humanitarian crises. It underscores the urgent need for integrated approaches that combine humanitarian assistance with climate adaptation, resilience-building, and long-term development strategies.

The humanitarian crisis in Syria is not only the result of conflict but also of the compounded pressures of climate change, poverty, and weak governance. Prolonged droughts, flash floods, and heatwaves exacerbate displacement, food insecurity, and health vulnerabilities, placing extraordinary pressure on already overstretched humanitarian systems. With over half the population displaced, essential services in ruins, and donor support dwindling, the crisis represents one of the greatest humanitarian and public health challenges of our time. Without sustained international engagement and investment in resilience, millions of Syrians will remain trapped in a cycle of conflict, displacement, and climate-driven vulnerability [2, 6, 12].

The Impact of Climate Change on Health

Climate change affects health by altering disease transmission, water systems, air quality, and food security [1]. Humanitarian health organizations must adapt by integrating climate-informed approaches into programs.

Examples include cholera outbreaks linked to warmer waters, increased asthma cases from dust storms, and malnutrition tied to crop failures. Humanitarian agencies face barriers: limited data, lack of technical expertise, and fragmented funding streams [10, 26].

Heatwaves and Health Risks

Heat waves are among the deadliest climate extremes. In Syria, exposure has already risen since 1910, and projections show further increases [10]. Heat exposure causes dehydration, kidney strain, cardiovascular stress, and death among vulnerable groups [26].

Children, the elderly, outdoor labourers, and IDPs in poorly ventilated tents are at the highest risk. Beyond physical health, heat amplifies mental stress, creating conditions of despair in already unstable communities.

Water Scarcity and Sanitation

Safe drinking water is a fundamental human right. The 7th SDG emphasises water and sanitation for all. In Syria, conflict destroyed much of the water infrastructure, reducing both access and quality [7]. Over half of the monitoring stations are now non-functional.

Households in southern Syria increasingly rely on unsafe sources. Few can afford proper

chlorination. Improper dosages of chlorine tablets expose 37% of households to cholera risk [18]. In Daraa, filtration is common, but quality remains inconsistent.

The combined effect of conflict and climate change has made water scarcity one of the greatest threats to public health [17].

Food Security and Nutrition

Globally, 825 million people face food insecurity [13]. In Syria, drought, conflict, and economic collapse intersect to create widespread hunger [9]. Poor intake drives malnutrition, which in turn weakens immunity and growth.

The interplay between food, care, and health reveals how climate stress worsens hunger cycles. In Syria, rising food prices, declining harvests, and disrupted supply chains leave millions food insecure. Yet international food aid is underfunded and politically manipulated [19].

Vulnerable Populations

Humanitarian crises amplify vulnerabilities, especially for those with fewer resources or less agency [3]. Syria's displaced populations face compounded risks: unsafe housing, poor nutrition, and climate-driven stressors like drought and flooding [12].

Children, women, elderly individuals, and those with disabilities face intersecting vulnerabilities. Fragile shelters often exclude accessibility measures, leaving people with disabilities stranded. Elderly individuals are neglected, as humanitarian aid tends to prioritize younger populations.

Climate stress deepens these divides by worsening poverty traps, where households must sell assets, reduce meals, or pull children from school to cope with climatic challenges. These dynamics perpetuate cycles of vulnerability and exclusion.

Children

Children represent one of the most profoundly affected groups in Syria. Exposure to violence, displacement, and environmental stressors has led to a multi-dimensional crisis. Nutritional deficiencies, particularly stunting and wasting, remain widespread, and recurrent cholera outbreaks have disproportionately affected children under five [4]. Education disruption compounds the problem, as loss of schooling erodes not only human capital but also access to basic health and nutrition programs traditionally delivered through schools. Conflict-related trauma has also had long-lasting mental health consequences, with children displaying chronic stress, anxiety, and behavioral disorders [5, 21]. Climate change multiplies these vulnerabilities: prolonged drought and heat stress reduce food availability, while floods and displacement undermine safe shelter and sanitation, leaving children more exposed to infectious disease.

Elderly

The elderly, often overlooked in humanitarian planning, face rising mortality and morbidity risks. Many lack the mobility to flee bombardments or relocate during floods, leaving them stranded in high-risk areas. Non-communicable diseases such as hypertension, diabetes, and chronic respiratory illnesses disproportionately affect older adults. Yet, continuity of care for these conditions has collapsed due to supply shortages and workforce depletion [3]. Climate-related hazards, extreme heat in particular pose additional risks, as older adults have reduced thermoregulation capacity and limited access to cooling infrastructure. Despite these vulnerabilities, elderly populations remain invisible in both humanitarian assessments and climate adaptation strategies, reflecting a systemic neglect that requires urgent rectification [10].

Women

Women face disproportionate impacts from both conflict and climate change [9]. In Syria,

they shoulder caregiving burdens and are first to sacrifice food and health for children [18].

Reproductive health services are scarce. Pregnant women suffer high rates of anemia and complications, worsened by malnutrition and stress. Early marriage, increasingly used as a coping strategy, exposes adolescent girls to early pregnancy and violence.

Water scarcity and camp conditions heighten risks of harassment and violence. Women walk long distances for water, often at risk of sexual violence [15].

Yet women are underrepresented in decision-making. Humanitarian planning must integrate a gender-sensitive climate lens, prioritizing reproductive health, protection, and women's leadership in adaptation.

Mental Health Implications

Mental health represents one of the least visible yet most profound impacts of Syria's crisis. Continuous exposure to conflict, displacement, and deprivation has generated a pervasive burden of trauma. Refugees and IDPs report high rates of post-traumatic stress disorder (PTSD), depression, and anxiety, with children and women disproportionately affected [2, 12]. The destruction of mental health infrastructure, compounded by the emigration of trained psychiatrists and psychologists, means services are grossly inadequate. Informal networks, including community and faith leaders, often provide the only available support.

Climate change acts as a secondary stressor, compounding the psychosocial toll of war. Droughts and crop failures intensify livelihood insecurity, contributing to despair among rural households. Repeated flooding and loss of shelter generate cycles of displacement, eroding a sense of safety and continuity. Extreme heat events exacerbate aggression, anxiety, and sleep disruption, further burdening already traumatised populations [23].

What emerges is not simply an epidemic of trauma but a structural crisis in mental health: lack of services, weak community coping mechanisms, and chronic exposure to stressors create conditions for intergenerational transmission of psychological harm. Addressing this requires humanitarian health actors to elevate mental health to the same priority level as communicable diseases and malnutrition, embedding psychosocial support into all levels of humanitarian planning.

Health System Challenges

The health system has faced galactic escalations of needs, sector-wide destruction and collapse, and a corresponding decline in human resources, financial and material resources, and control. Health system access has deteriorated, affecting all population groups. People's choices regarding health providers, services, and practices have also changed. However, as might be expected in a complex disaster, some humanitarian needs were still being met. There was evidence of former systems being replicated in new forms and quickly attuning to the transformed environment [14, 21]. The scope of collapse in the Syrian health system was unparalleled in recent decades. Hospitals and primary care facilities that had once provided a comprehensive network of services were reduced to shells, often stripped of equipment, devoid of staff, and unable to provide even the most basic emergency services. The destruction was not just physical but systemic loss of governance, breakdown of referral pathways, collapse of medical education pipelines, and evaporation of donor funding streams.

Health workers were subject to siege and shelling, killed and abducted, restricted in movement, and had their loyalties tested. Facilities were destroyed, repurposed, and blocked or relieved. However, through violence and 'catch and release' health systems powered onward, resurfacing, adapting, replicating, and continuing to function [22]. Communities organized clandestine clinics in basements, mobile medical units emerged in conflict areas,

and NGOs stepped in to fill the gaps. Science produced new weapons, and old weapons were invented anew. As far back as 4000 BCE, health was used as a weapon in the siege of Jerusalem with a disposition of disease-bearing rodents. That obscure and scandalous event has repeated itself from the wars of Troy to blistering agent attacks in World War I and the 2014 CW Munitions Attacks in Ghouta. The use of chemical and biological agents throughout history reminds us of the vulnerability of civilian health during times of war. Global Health has faced accusations of being used as an integrating mechanism for pre-war health systems by belligerents or being unctuously ignored. The Syrian health system has demonstrated resilience in certain areas despite overwhelming odds, but the constant cycle of destruction and patchwork recovery has left an enduring fragility that will take decades to heal [27].

Infrastructure Damage

Water and sanitation infrastructure is a prerequisite for the delivery of safe drinking water and public health. Urban infrastructure systems are physically complex and economically expensive; when damaged or destroyed, they can take a long time to repair. Structural destruction of water infrastructure causes the population to turn to unsafe alternative water sources, jeopardising health from waterborne diseases [17, 18]. In Syria, the deliberate targeting of infrastructure water stations, pipelines, sewage treatment facilities became a weapon of war, depriving entire communities of life-sustaining resources.

In Syria, the early years of the conflict left more than 90% of prewar water infrastructure functional, most together with their treating systems. Since then, infrastructure destruction has been rampant. In 2020, two million displaced and marginalised people in northwestern Syria turned to unregulated and untreated sources of water. Widespread sewage leakage and the collapse of solid waste collection risked becoming the main cause of disease outbreaks, accelerating death rates, malnutrition, and displacement [18, 19]. These conditions bred cholera, dysentery, hepatitis A, and other waterborne diseases that spread quickly in crowded camps and informal settlements. Breakdowns in infrastructure and the widespread use of infectious receptors in the population necessitate monitoring of water and the delivery of health services.

Chlorination of water with chlorine gas or powder is the simplest and most effective way to disinfect water. It is applicable to break the transmission of other enteric, vector-borne, or respiratory pathogens. Functional chlorinated water stations are essential in humanitarian settings [21]. However, the destruction of chlorination stations, coupled with restrictions on the import of chlorine under the guise of "dual-use" material controls, has crippled adequate water and sanitation interventions. This infrastructure devastation not only affects public health but also undermines trust in humanitarian responses. Without safe water and waste management, even the most robust health systems cannot function effectively [28].

Resource Allocation

Humanitarian medical organizations are not standalone entities but rather part of a larger ecosystem of interconnected communities proposed by the Goodman Model: the funders, sectoral NGOs, implementers, governments, local NGOs, beneficiaries, and the military. In the humanitarian ecosystem, each player faces its own respective resource allocation dilemmas. Still, organisations must utilise their networks and engage in the design of a well-governed global strategy to enhance climate change resilience in humanitarian-oriented systems [20, 23]. Effective resource allocation is not only a matter of distributing financial resources but also of ensuring equitable distribution of human resources, medicines, equipment, and infrastructure across geographies.

All humanitarian ecosystem players must consider adapting their governance and ethics frameworks according to the Health Systems Thinking Framework, which can be used by all sectors (funders, HMAN organizations, governments, etc.) to promote multi-level governance and the mechanism to strengthen collaboration and partnerships among players [26]. The resource allocation optimization solution must also provide the transparency and accountability needed to build and maintain funding players' trust. Significantly, allocation decisions are often influenced by political priorities and donor preferences, which may not align with the most urgent health needs on the ground. For instance, while some donors prioritise high-visibility interventions such as trauma care, less visible but equally essential services such as mental health support, maternal care, or chronic disease management remain underfunded. Without reforming allocation frameworks, the humanitarian ecosystem risks perpetuating cycles of inequity [29].

Adaptation Strategies

Climate change exacerbates existing environmental health hazards and creates new risks as it is linked to a wide range of health issues. Humanitarian organisations increasingly acknowledge this climate-humanitarian-health nexus, while most of their climate change-related work has focused on greenhouse gas emissions assessments, adaptation/mitigation strategies, and the health risks of climate-related disasters in the broader development context [11]. The health effects of climate change include direct impacts such as heat-related illnesses and injuries from extreme weather events, as well as indirect impacts through changes in food systems, vector-borne diseases, displacement, and economic collapse.

Humanitarian organisations have dedicated climate change adaptation funding, which is expected to grow. However, climate change adaptation is not included in a range of humanitarian financing tools, and there are concerns that this funding faces competition from other priorities amongst funding [26]. There is little supportive evidence on the climate-health impacts of humanitarian work. Although many public health coalitions, individual academics, and NGOs communicate on climate change and health in general, this area is a key gap in humanitarian communications. The absence of a systematic approach to climate-health adaptation within humanitarian strategies highlights the urgent need for integrated approaches that cut across sectors such as WASH, nutrition, mental health, and education. Strengthening early warning systems, enhancing community preparedness, and embedding climate literacy into humanitarian health programs are essential steps toward sustainable adaptation.

Public Health Interventions

In remote locations, it is essential to develop enhanced health system management models that include stakeholders from outside the health system. The urgent implementation of public health assessments is warranted [22]. Rapid needs assessments and epidemiological surveillance systems must be designed to work under conditions of limited infrastructure, insecurity, and shifting population dynamics.

Previous experiences from newer public health system implementers can provide off-the-shelf protection plans, including but not limited to enhanced disease surveillance and response. Additional support should include training and equipment provision for immediate application in field ambulances and Emergency Medical Teams [21, 23]. A nimble integration of disparate emergency and static response components is necessary to assist health systems in absorbing those in need of peace. This requires not only coordination among humanitarian organizations but also partnerships with local actors who understand the social, cultural, and political contexts. Such interventions should also integrate mental

health and psychosocial support, maternal and child health services, and chronic disease management into emergency responses. Public health interventions in crises must evolve beyond reactive measures to proactive, community-driven strategies that can withstand recurring shocks.

Community Resilience Building

The existing health system resilience in the face of crisis is defined as the ability of the health system to anticipate, absorb, accommodate, and recover from the effects of crises [14, 21]. Resilience aims to reduce risks from hazards and mitigate them through robust systems to keep people safe. Community resilience is also defined as the ability of a community to come together and cope with a disaster from a physical, social, emotional, and economic point of view [19].

The five major characteristics of a resilient system are: (i) flexibility; (ii) learning; (iii) foresight; (iv) network; and (v) robustness [10, 20, 26]. The health system is based on a strong foundation for addressing health needs, providing good-quality provision of health services; human resources for health; supplies and infrastructure; and adequate financing and funding for health care. Building resilience requires investing not only in infrastructure but also in social capital, community solidarity, and local leadership. Communities that are actively involved in planning, monitoring, and evaluating health interventions demonstrate stronger resilience in times of crisis. Programs that engage women, youth, and marginalized groups in resilience-building efforts often produce more inclusive and sustainable outcomes. In Syria, grassroots initiatives such as women-led health cooperatives and youth volunteer networks have shown that community ownership can significantly enhance the effectiveness of humanitarian responses.

International Response and Aid

At the UN Climate Change Conference COP26, world leaders declared the dire consequences of not taking urgent and adequate climate action [24]. Climate change is likely to increase the number of people forced to flee their homes due to the dangerous combination of rising sea levels, heatwaves, and natural disasters [25]. Humanitarian assistance is critical, and there is an urgent need to prepare more systematically. Stakeholders providing humanitarian aid are increasingly aware of the impacts of climate change on vulnerable communities.

National and international humanitarian assistance is provided through a diverse group of actors, including United Nations agencies, local and international non-governmental organizations, bilateral humanitarian aid agencies, corporations, and foundations [14]. Climate change exacerbates existing health challenges, including increasing disease burden, food and water insecurity, and mental health issues associated with poverty and conflict [25]. COVID-19 is further complicating health challenges. Climate change negatively impacts health systems, as it compromises human security and economic growth, which act as determinants of health [11, 24].

Disadvantaged and marginalised people are likely to experience the adverse effects of climate change disproportionately. Climate change has transitioned from being an environmental issue to an issue with growing consequences for human health, human rights, equity, and social justice [26]. The demand for external humanitarian assistance could double by 2050. However, there is still an optimistic time within which to mitigate the worst effects of climate change on vulnerable populations. The needs are urgent, as are calls for external support from humanitarian actors. Climate change is already recognised as a serious threat to global security and stability, with implications for regional and global migration

[25]. The international community must urgently prioritize coordinated funding mechanisms, improve accountability, and strengthen partnerships with local actors to ensure humanitarian aid remains effective in increasingly complex emergencies.

Role of NGOs

As organizations providing assistance or protection to vulnerable communities, non-governmental organizations (NGOs) must familiarize themselves with the links between climate change and health [9, 16]. This includes the health impacts of climate change in general, as well as those focusing on humanitarian crisis in particular. For organizations wishing to acquire more information and strengthen their own understanding and capacities, consultations can be organized.

NGOs can be effective advocates, as many climate-sensitive health impacts are preventable through mitigation and adaptation actions [23]. NGO advocacy could focus on key health-relevant outcomes from GHG emissions and exposures with evidence of unjust distribution, including increased ill health in specific population subgroups or communities least responsible for emissions [26]. Inputs published by humanitarian NGOs to date show concurrence with concerns raised by public health colleagues regarding climate impacts on health and various scenarios of how health systems will reshape under high emissions trajectories.

Humanitarian voices are now called for to advocate for vulnerable people during high-level climate discourse. Humanitarian organisations have the proximity to witness suffering and preventable loss of life exacerbated by climate change [24]. Organisations can amplify the voices of those most affected, who often have the least responsibility for the cause. Such personal accounts and stories are much more powerful and engaging than information about outcomes-driven statistics, slow cumulative changes, or systems-oriented concepts. NGOs also play a critical role in piloting innovative approaches such as solar-powered health clinics, climate-smart agriculture projects, and community-based disease surveillance systems. These grassroots interventions often pave the way for larger systemic reforms.

Governmental Support

The Syrian government has undertaken several measures to support the health system in light of the anticipated impacts of climate change on public health [21]. These initiatives can be broadly organized into five categories. First, the government is currently developing an operational framework for assessing climate change impacts on water supply [22]. This framework will serve as a valuable resource for the implementation of large-scale adaptation/mitigation projects.

Second, Syria has explored options for diversifying its energy resources in response to climate risks. The government has completed assessments and is working on a green growth plan that incorporates renewable energy targets [23]. Third, the country has implemented a series of projects aimed at reducing heat wave impacts on vulnerable populations through early warning systems. Fourth, Syria recently launched a project on developing the national climate change adaptation communication and information system [21]. This system will support systematic monitoring and assessment of climate change impacts and adaptation efforts. Finally, there is scope for establishing a monitoring system to assess the speed of change in population health as a result of climate change impacts [25].

Although the health system has shown resilience to climate risks and has made commendable progress in several areas, it must work proactively as a whole to prepare for the imminent impacts of climate change on human health [26]. Climate change has amplified existing health risks and created potential for new health threats. Adaptation efforts against

climate change health impacts have hampered due to dogmas, policies, and practices that neglect and, in some cases, exacerbate vulnerability. Interestingly, fearing that they would repeat past mistakes, health actors that failed to get involved in climate action previously are now resisting involvement altogether. Nevertheless, taking the backseat risks being supplanted in climate health discussions. Conditions for constructive engagement in climate action should be explored to allow participation in the narrative and subsequent interventions (Jamal et al., 2019) [21]. Strengthening governmental leadership in this area will be crucial to long-term system sustainability.

Case Studies

The International Research Institute for Climate and Society (IRI) and humanitarian organizations: twenty years of a fruitful collaboration [18]. During the calendar year for which reports are being consolidated, the IRI has collaborated with the International Federation of Red Cross/Red Crescent Societies (IFRC) in multiple capacities to enhance responses to climate risks. These activities have included introduction of weather and climate forecast maps to understand better the impact of heavy rains and flooding on the outbreak of infectious diseases in cases such as in Central America and West Africa [19]; working with decision-makers in disaster management and public health to provide climate information that assists with the allocation of scarce resources; and enhancing preparedness to manage rainy season cholera outbreaks in West Africa [21].

Framework outcome: Humanitarian health organizations' capacities to prevent, control and manage climate risks. The majority of humanitarian health organizations' recognition of emerging climate risks to health and humanitarian action [22]. Although most humanitarian health organizations have climate action efforts in place, few of them are well defined with set targets and measurable indicators. Only a quarter of humanitarian health organizations are currently working with or are aware of existing efforts. National and international leaders' roles, trust and personal attributes are critical in promoting or hindering the consideration of climate during humanitarian action and decision-making [23].

Case Study 1: Aleppo

Aleppo is the largest city in Syria and the second-largest city in the country after the capital, Damascus [24]. It is part of the Aleppo Governorate and has been the capital of the Aleppo Governorate since Ottoman times. Aleppo was a center for commerce and trade. There is also a detailed description of the "rayas" in the surrounding rural area which are villages with mud brick houses piled one on top of another.

Due to the central location of Aleppo desired as a commercial trade center, it was besieged by the government forces and was severely damaged by bombing [25]. Agriculture and livestock breeding were the livelihood of more than half of the population in the rural area surrounding Aleppo. One of the water sources, the Aleppo aquifer, which was the main water reservoir of the city, was damaged by shelling and bombing and has not functioned since then. A Dead Sea and land-sea boundary zone were discovered additionally around the Aleppo aquifer. It is thought that the damage to the aquifer and the boundary caused by the combats is the main reason for illness among the population in Aleppo, including cancers, respiratory system diseases, and children's growth problems [20, 26].

Case Study 2: Idlib

Idlib governorate is a small, yet densely populated area located north of Aleppo and bordering Turkey. It is home to four million people, two million of whom are internally displaced people [11]. The governorate has experienced a protracted humanitarian crisis

since 2011. Escalating violence and military siege have further deteriorated access to health care [15]. Primary health care services provided by the Idlib Health Directorate are insufficient to meet basic needs. Health care for COVID-19, encompassing both preexisting and newly established facilities, comprises three levels: a general hospital offering secondary health care and a quarantine centre for COVID-19. However, services are still inadequate, and patients have to pay a high out-of-pocket expenditure [25].

Notably, primary health care services in Idlib have significantly improved since 2016. In March 2020, an outbreak of COVID-19 was reported in northwest Syria. Since then, health authorities and health partners have been working around the clock to prepare for and control the spread of the disease. The Idlib governorate is located in northwest Syria and has been the epicentre of the Syrian humanitarian crisis for years. Continued violence and a long-term military siege have affected every aspect of life and services in the area [22]. The Idlib case study illustrates the limits of humanitarian health response when access, funding, and infrastructure are constrained.

Policy Recommendations

Climate change poses an ever-growing threat to clean water, food security, and health, while increasing the frequency and severity of extreme weather events that may require a humanitarian response [11]. Despite this, humanitarian health actors have overlooked mainly the impacts of climate change. The Common Response Framework to Climate Change was undertaken to enhance the ability of humanitarian organizations to anticipate, prevent, prepare for, and manage climate-related health risks [23]. Effective policy recommendations must emphasize integrated approaches: cross-sectoral collaboration, long-term funding mechanisms, and embedding climate resilience into all levels of humanitarian programming. Without strong policy frameworks, even well-designed interventions risk fragmentation and inefficiency.

Sustainable Development Goals

The recently adopted 2030 Agenda for Sustainable Development presents a historic and unprecedented commitment by the global community to 1) end all forms of poverty; 2) ensure all people have access to basic services; and 3) promote sustainable, inclusive and equitable economic growth while combating climate change and environmental degradation [19]. Underlying these objectives are 17 Sustainable Development Goals (SDGs), which address issues ranging from social aspects such as poverty and education, to economic dimensions like income inequality, to environmental challenges including climate change and ecosystem degradation [24]. The SDGs provide a vital global framework that ties humanitarian health to climate resilience. Integrating humanitarian health response into the SDG framework ensures that immediate interventions align with long-term development goals.

Climate Action Plans

The effects of climate change are already being felt across all regions of the world [10], 20]. Its severity will undoubtedly increase with a significant, sustained drop-off in quality of life and a logical increase in humanitarian crises [22]. Medical futures are not predetermined instead, they are co-created over time and with expertise by diverse actors [21]. Climate change will need to be met with an understanding of how to take alternative, sustainable pathways to meet this challenge [26].

Action plans must include climate-smart health infrastructure, renewable energy integration in health facilities, and robust disease early warning systems. Embedding resilience thinking into health systems requires

strong political will, donor engagement, and community participation. For countries like Syria, which are already grappling with conflict, climate action plans must be conflict-sensitive, realistic, and context-specific.

Future Research Directions

Given all the available entries found in the literature, there are many avenues available to expand on this topic [14, 19]. This paragraph outlines various avenues for further exploration of the framework's interconnection between climate change and public health in humanitarian crises [20]. The growing number of research studies indicates an understanding of the need to integrate climate change and health to improve the preparedness and capacity of organisations working on humanitarian health issues [23]. However, there is still room for further exploration in different areas. Future research should focus on several key areas: the longitudinal health impacts of climate shocks, gender- and age-specific vulnerabilities, the integration of climate models with health surveillance data, and the evaluation of adaptation strategies. Building a robust evidence base will allow humanitarian actors to tailor interventions more effectively and advocate more persuasively for resources.

Conclusion

The Syrian crisis epitomises the convergence of conflict, climate change, and fragile governance as compounding determinants of public health emergencies. Years of civil war have dismantled a once relatively strong health system, leaving infrastructure fragmented, health workers displaced, and populations dependent on humanitarian aid. Against this backdrop, climate change acts as a risk multiplier, exacerbating water scarcity, food insecurity, the spread of communicable diseases, and psychosocial distress. The intersection of these forces has created a protracted humanitarian emergency, where fundamental health rights are undermined and resilience is eroded at both individual and community levels [1, 6].

This study underscores that health cannot be safeguarded in Syria, or in comparable conflict-affected contexts, without systematically embedding climate adaptation into humanitarian planning. Vulnerable populations, including children, women, the elderly, and displaced communities, face disproportionate risks that demand targeted interventions. For example, maternal and child health services must be climate- and conflict-sensitive, elderly populations require better integration into adaptation frameworks, and mental health must be elevated as a central pillar of humanitarian response rather than a secondary concern [10, 17].

A systems-thinking perspective reveals that the challenges are not discrete but interconnected. Water scarcity affects food security; food insecurity drives malnutrition and disease susceptibility; displacement amplifies mental health burdens; and climate extremes compound all. Humanitarian responses that remain siloed will therefore fall short. Instead, integrated strategies that bridge health, climate, and humanitarian sectors are required. This includes investment in resilient health infrastructure, protection of health workers, gender-sensitive programming, and anticipatory climate-risk management linked to humanitarian financing [11, 21].

Finally, the Syrian case has global resonance. It highlights that in the 21st century, humanitarian crises will increasingly be shaped by the dual forces of political conflict and climate disruption. Addressing one without the other risks perpetuating cycles of vulnerability. Policymakers, donors, and humanitarian actors must therefore embrace a paradigm shift: recognizing climate change not as an external backdrop but as a central driver of humanitarian health challenges. Only by adopting integrated, evidence-based, and equity-focused approaches can the international community prevent further

collapse of fragile health systems and foster resilience in Syria and beyond [12, 23].

Conflict of Interest

The author declares no conflict of interest.

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References

[1]. Nayna Schwerdtle, N., Bowen, K. J., and McMichael, C., 2020, 'The health impacts of climate change in humanitarian settings: a call to action', *PLOS Medicine*, 17(9), p. e1003269, https://doi.org/10.1371/journal.pmed.1003269.

[2]. Meiqari, L., Hoetjes, M., Baxter, L., and Lenglet, A., 2018, 'Health impact of Syria's conflict: a review', *International Journal of Public Health*, 63(7), pp. 745–753, https://doi.org/10.1007/s00038-018-1102-3.

[3]. Ali Mian, N., 2019, 'Health and health care challenges for older adults in Uganda', *Journal of Aging & Social Policy*, 31(3), pp. 234–251, https://doi.org/10.1080/08959420.2018.1534812.

[4]. du Cros, P., Heywood, A. E., and MacIntyre, C. R., 2013, 'Climate change and the elderly: vulnerabilities, risks and responses', *Health Promotion Journal of Australia*, 24(3), pp. 159–162, https://doi.org/10.1071/HE13064.

[5]. Richmond, M., 2017, 'Mental health and psychosocial support in conflict: The Syrian crisis', *Journal of Humanitarian Affairs*, 1(1), pp. 18–29.

[6]. Garry, S., Checchi, F., and Roberts, B., 2018, 'The impact of conflict on health systems: a case study of Syria', *BMJ Global Health*, 3(6), p. e000844, https://doi.org/10.1136/bmjgh-2018-000844.

[7]. Haar, R. J., Read, R., and Klonsky, M., 2023, 'Infrastructure targeting in conflict zones: Health impacts of water system destruction in Syria', *The Lancet Planetary Health*, 7(3), pp. e237–e244, https://doi.org/10.1016/S2542-5196(23)00034-1.

[8]. Jamal, A., Howard, N., and El-Bouz, M., 2019, 'Building resilient health systems in fragile settings: Lessons from Syria', *Global Health: Science and Practice*, 7(Suppl 1), pp. S47–S60, https://doi.org/10.9745/GHSP-D-18-00406.

[9]. Watts, N., et al., 2018, 'The 2018 report of the Lancet Countdown on health and climate change: shaping the health of nations for centuries to come', *The Lancet*, 392(10163), pp. 2479–2514, https://doi.org/10.1016/S0140-6736(18)32594-7.

[10]. IPCC, 2022, Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report, *Cambridge University Press*, https://www.ipcc.ch/report/ar6/wg2/

[11]. WHO, 2021, Climate Change and Health, *World Health Organization*, https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health

[12]. UNHCR, 2023, Global Trends: Forced Displacement in 2022, *UNHCR, The UN Refugee Agency*, https://www.unhcr.org/globaltrends2022/

[13]. FAO, 2021, The State of Food Security and Nutrition in the World 2021, *Food and Agriculture Organization of the United Nations*, https://www.fao.org/3/cb4474en/cb4474en.pdf

[14]. Akik, C., et al., 2021, 'Health system resilience in Lebanon: Responding to the Syrian refugee crisis and economic collapse', *BMJ Global Health*, 6(8), e005003, https://doi.org/10.1136/bmjgh-2021-005003.

[15]. Ebi, K. L., and Semenza, J. C., 2008, 'Community-based adaptation to the health impacts of climate change', *American Journal of Preventive Medicine*, 35(5), pp. 501–507, https://doi.org/10.1016/j.amepre.2008.08.018.

[16]. Burkle, F. M., 2010, 'Complex humanitarian emergencies: A review of epidemiological and response models', *Public Health*, 124(3), pp. 169–173, https://doi.org/10.1016/j.puhe.2009.12.010.

[17]. Gleick, P. H., 2014, 'Water, drought, climate change, and conflict in Syria', *Weather, Climate, and Society*, 6(3), pp. 331–340, https://doi.org/10.1175/WCAS-D-13-00059.1.

[18]. UNICEF, 2019, Water Under Fire: For Every Child, Water and Sanitation in Complex Emergencies, *United Nations Children's Fund,* https://www.unicef.org/media/55896/file/Water-under-fire-2019.pdf

[19]. Verner, D., et al., 2021, Ebb and Flow: Volume 1: Water, Migration, and Development, *World Bank Group,* https://doi.org/10.1596/978-1-4648-1742-1.

[20]. Keim, M. E., 2008, 'Building human resilience: The role of public health preparedness and response as an adaptation to climate change', *American Journal of Preventive Medicine*, 35(5), pp. 508–516, https://doi.org/10.1016/j.amepre.2008.08.022.

[21]. WHO EMRO, 2022, Syria Health Cluster Bulletin, *World Health Organization Regional Office for the Eastern Mediterranean,* https://www.emro.who.int/syr/publications/

[22]. Salama, P., et al., 2004, 'Health and nutrition in conflict settings: A review of the evidence', *The Lancet*, 364(9448), pp. 219–227, https://doi.org/10.1016/S0140-6736(04)16683-1.

[23]. Watts, N., et al., 2015, 'Health and climate change: Policy responses to protect public health', *The Lancet*, 386(10006), pp. 1861–1914, https://doi.org/10.1016/S0140-6736(15)60854-6.

[24]. Patz, J. A., et al., 2005, 'Impact of regional climate change on human health', *Nature*, 438(7066), pp. 310–317, https://doi.org/10.1038/nature04188.

[25]. Black, R., Adger, W. N., and Arnell, N. W., 2011, 'The effect of environmental change on human migration', *Global Environmental Change*, 21(Suppl. 1), pp. S3–S11, https://doi.org/10.1016/j.gloenvcha.2011.10.001.

[26]. Watts, N., et al., 2019, 'The 2019 report of The Lancet Countdown on health and climate change: Ensuring that the health of a child born today is not defined by a changing climate', *The Lancet*, 394(10211), pp. 1836–1878, https://doi.org/10.1016/S0140-6736(19)32596-6.

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Socio-Demographic Predictors of non-communicable Diseases among People Living with HIV on ART in Enugu, Southeast Nigeria

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Abstract

Human Immunodeficiency Virus remains a major global health burden, with millions affected worldwide. Although Antiretroviral Therapy (ART) has reduced HIV-related deaths, its long-term use has been associated with the development of non-communicable diseases (NCDs). This study investigated socio-demographic predictors of NCDs among People Living with HIV (PLHIV) on ART in Enugu, Southeast Nigeria. A hospital-based cross-sectional design was employed to abstract data on socio-demographic characteristics, prevalence, and risk factors among PLHIV aged ≥18 years. Data were analyzed using IBM SPSS Statistics 25, with results presented as frequencies, percentages, and mean ± standard deviation. Logistic regression was applied to generate adjusted odds ratios (AOR) with p-values ≤0.05 at 95% confidence interval. Findings showed that age, marital status, education, and occupation significantly predicted NCD onset. Participants aged 41–60 years were four times more likely to develop hypertension (AOR: 4.47; CI: 3.32–6.18). Being married increased the likelihood of developing any NCD, while secondary education was strongly associated with hypertension (AOR: 4.52; CI: 3.34–5.94) and diabetes (AOR: 2.55; CI: 1.97–3.02). Unemployment also predicted hypertension (AOR: 3.72; CI: 1.32–3.08). Female participants had higher likelihood of hypertension, obesity, and cervical cancer than males. These results highlight the critical role of socio-demographic factors in NCD development among PLHIV on ART. The study underscores the importance of incorporating targeted, context-specific interventions that address socio-economic determinants in HIV care to reduce NCD comorbidities and improve quality of life of affected individuals.

Keywords*: Antiretroviral Therapy, Human Immunodeficiency Virus, Non-communicable Disease, Predictors, Socio-demographics.*

Introduction

According to WHO, approximately 38.4 million people were reported living with HIV globally at the turn of 2021 [1]. Out of this global estimate, Nigeria has an HIV prevalence of 4.1% and presently about 3.6 million people are living with HIV/AIDS [2], making the country second only to South Africa with largest number of people living with HIV (PLHIV).

Although antiretroviral therapy (ART) has been shown to be effective in HIV, expanded access to treatment has exposed PLHIVs to challenges including increase in comorbidity of non-communicable diseases (NCDs) such as hypertension, diabetes, obesity, cardiovascular disease (CVD) and cancer [3]. This increased incidence of NCD comorbidity in HIV accounts for approximately 70% of global deaths annually [4] posing challenging concerns of reduced quality of life among others. Consequently, on the other hand, [3] argued that the use of ART has resulted in decrease in the annual number of HIV-related deaths and new infections in sub-Saharan Africa but with an attendant increase in ageing HIV-infected population [5, 6].

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Studies have linked NCDs and aging in PLHIVs [7, 8]. Similarly, prevalence of NCD risk factors have been reported to include smoking, alcohol or drug use, comorbid HPV infection and lower socio-economic status [9, 10], which impact development of NCD but limited data exist on the effect of socio-demographic factors as risk factors or predictors of NCD development in PLHIV on ART use. Further, antiretroviral therapy drugs have been reported to increase risk of abdominal fat, hypercholesterolemia and metabolic fat [11, 12] increasing the risk for developing chronic illnesses such as diabetes mellitus and cardiovascular diseases. Additionally, the increased activation of the immune system and secretion of inflammatory cytokines results in higher risk for atherosclerosis and inflammation [8].

Nonetheless, as public health concerns increase regarding NCD development in PLHIVs on ART, demographic studies which focus on social and economic dimensions of HIV-NCD comorbidity are lacking. Hence, studying this perspective has become a top priority of public health specialists to provide information for policymakers to better manage the intersection of HIV and NCDs. In this light, the present study aimed to investigate socio-demographic characteristics as predictors of NCD in PLHIVs on ART in Enugu, Southeast Nigeria.

Methodology

Study Design

This study employed a hospital-based cross-sectional study design to investigate prevalence and risk factors of non-communicable diseases (NCDs) among people living with HIV (PLHIV) of age ≥18yrs on Antiretroviral Therapy (ART) in Enugu, Southeast Nigeria.

Study Area

The study was conducted in Enugu state located in the southeastern Nigeria (Latitude: 6.5° N and Longitude: 7.5° E) [13]. Geographically, Enugu state is a tropical savanna climate with a topography marked by several rivers as well as characterized by its hills, valleys and plateaus. It is further bounded to the north by Kogi and Benue States, to the south by Abia State, to the east by Ebonyi State, and to the west by Anambra State. The state's health sector is comprised of two tertiary health facilities namely University of Nigeria Teaching Hospital (UNTH) in Ituku-Ozalla and the Enugu State University Teaching Hospital (ESUTH) in Parklane. In addition, the state has a number of private healthcare facilities, offering additional options for patients [14, 15].

Study Site

The study was conducted in health facilities randomly selected that provide HIV care and treatment in the state.

Study Population

The study was conducted among People living with HIV (PLHIV) age ≥18yrs, initiated on ART in Enugu State, Nigeria.

Sample Size Determination

The estimated number of mothers recruited for the study was determined using the sample size formula for estimation of single proportion.

$$\boldsymbol{N = \frac{Z^2 pq}{d^2}.}$$

Where Z = 1.96 (standard normal deviate); p = 50% = 0.50 (assumed prevalence of NCDs among PLHIV in South East Nigeria), q = 1-p; and d = Level of precision set at 0.05 (95% confidence interval)

$$N = ((1.96)^2 * 0.5 * 0.5))/0.05\text{^}2$$

$$N = 384.16$$

$$\boldsymbol{Non - response\ rate = \frac{n}{1-Q}.}$$

Q = proportion of non-response = 10%

$$Non - response\ rate = \frac{n}{1 - \left(\frac{10}{100}\right)}.$$

$$= \frac{384}{1 - \left(\frac{10}{100}\right)}$$

$$= 426.6.$$

Therefore, final sample size was approximated to be equal to 427.

Sampling Procedure

Multi-stage sampling technique was employed to select local government areas (LGAs), health facilities and eligible clients that took part in the study. The multi-stage technique included three stages in which a sample frame of all LGAs in each senatorial zone were obtained and simple random sampling was used to select LGAs of study. In stage two, a sample frame of all health facilities providing HIV care and treatment services in each selected LGA was developed before simple random sampling was employed to select health facilities. In stage three, proportional allocation was utilized to determine the number of clients to participate in the study. A sample frame of all eligible patients receiving HIV care and treatment was further developed.

Eligibility Criteria

The following criteria guided the inclusion and exclusion of participants into the study:

Inclusion Criteria

1. People living with HIV (PLHIV) aged ≥18 years and are currently engaged in HIV and care and treatment at the time of the study.
2. People living with HIV (PLHIV) who have been on ART for at least six months and actively engaged in HIV and care and treatment at the time of the study.
3. People living with HIV (PLHIV) on HIV care and treatment who are willing to participate and provide informed consent.

Exclusion Criteria

1. People living with HIV (PLHIV) who are not on ART.
2. People living with HIV (PLHIV) who are below 18 years of age.
3. People living with HIV (PLHIV) on HIV care and treatment who do not consent to participate in the study.

Instrument for Data Collection

A medical health informatics script was designed and used to retrieve client level information of study participants from the hospital based electronic medical records (EMR). Clinical chart abstraction was carried out to obtain clinical, socio-demographic, NCDs records and treatment information of study participants not originally captured on the EMR.

Data Collection Method

Research assistants were recruited in the study sites, trained on use of data instruments prior to field visit and then deployed to collect data based on the items of the data collection tool. This process was facilitated by the lead researcher and trained health educators with sound knowledge of the subject theme.

Data Management and Analysis

Data was entered into and analyzed using IBM SPSS Statistics 25 software. Continuous variables were presented as mean ± standard deviation if normally distributed. Adjusted odd ratios (AOR) were used to express predicted values of socio-demographic characteristics using logistic regression analysis and *p* values less than or equal to 0.05 were considered significant at 95% confidence interval.

Ethical Considerations

Ethical approval was obtained from the Health Research Ethics Committee, UNTH Ituku/Ozalla, Enugu and permission was granted by the Hospital management of the selected health facilities where the study took place. Informed consent was obtained from individual study participants as much as confidentiality, anonymity, privacy and security of the participants' information were assured including option of voluntary exit from study.

Results

Socio-demographic characteristics of PLHIVs with NCDs

The socio-demographic characteristics of the study participants are presented in the table below. A total of 8182 abstracted patient records were analyzed and over two-thirds of records (4325) were women while 690 were men representing PLHIVs on ART with evidence of any NCD. At the time of data abstraction, approximately half (50.2%) of patients were aged between 41 and 60 years where women were more likely to be in age group (p = 0.001). The majority (64.9%) of patients were married with over half (55.1%) of the women being in this category (p = 0.001). Further, at time of abstraction, 12.1% were single, 14.3% were never married, 5.2% were widowed, 1.1% were divorced while 0.3% were cohabiting with more women than men (p = 0.01) being in any marital status in this study cohort. While 7.2% of study participants had no formal education, over half (59.7%) had their education up to secondary level with 18.3% and 12.4% up to primary and tertiary education respectively. There was a significant difference (p = 0.001) between the educational levels as well as notable significant difference (p = 0.01) between men and women in formal education in the study cohort. Majority (65.5%) of the patients were employed while 29.6% were unemployed with more women likely to be in formal or informal employment than men (p = 0.01). In this cohort, 61.3% of patients had initiated ART by the time of data abstraction, with no significant differences by sex (p = 0.57). Just over half of the patients in the cohort had been initially enrolled in care between 01 January 2006 to 30 April 2024 (55.3%). No differences were observed by sex across the guideline enrollment periods (p = 0.070).

Table 1. Socio-demographic Characteristics of PLHIVs with NCDs

Variable	Hypertension		Diabetes		Obesity		Cervical cancer	
	Frequency (*f*)	Percentage (95% CI)	Frequency (*f*)	Percentage (95% CI)	Frequency (*f*)	Percentage (95% CI)	Frequency (*f*)	Percentage (95% CI)
Gender								
Female	710	62.06 (58.76 – 67.71)	54	66.67 (59.91 – 72.83)	681	74.83 (70.92 – 78.31)	2880	100
Male	434	37.93 (35.43 – 43.32)	27	33.33 (29.82 – 37.43)	229	25.16 (21.42 – 29.33)	-	0
Age								
0-20	2 (1M, 1F)	0.17 (M: 0.08 [0.05 – 0.11]; F: 0.08 [0.05 – 011])	-	-	4 (2M, 2F)	0.44 (M: 0.22 [0.09 – 0.34]; F 0.22 [0.09 – 0.34])	38	1.32 (0.86 – 1.73)
21-40	238 (65M, 173F)	20.80 (M: 5.68 [2.34 – 8.31]; F: 15.12 [11.18 – 18.23])	13 (1M, 12F)	16.04 (M: 1.23 [0.98 – 1.75]; F: 14.81 [11.81 – 16.72])	350 (68M, 282F)	38.50 (M: 0.07 [0.02 – 0.10]; F: 30.98 [27.27 – 34.81])	1650	57.29 (53.18 – 64.22)

41-60	765 (299M, 466F)	66.87 (M: 26.13 [21.04 – 29.72]; F: 40.73 [37.27 – 44.73])	52 (19M, 33F)	64.19 (M: 23.45 [19.97 – 27.84]; F: 40.74 [38.82 – 47.94])	509 (141M, 368F)	55.93 (M: 15.49 [12.93 – 19.41]; F: 40.43 [34.62 – 47.35])	1192	41.39 (36.63 – 38.91)
61-80	138 (69M, 69F)	12.06 (M: 6.03 [4.84 – 7.02]; F: 6.03 [4.84 – 7.02])	15 (7M, 9F)	18.51 (M: 8.64 [5.73 – 10.02]; F: 11.11 [7.92 – 14.94])	47 (18M, 29F)	5.16 (M: 1.97 [1.23 – 2.24]; F: 3.18 [2.24 – 5.21])	-	-
81-100	1 (1F)	0.09 (0.02 – 0.11)	-	-	-	-	-	-
Marital status								
Single	124 (49M, 74F)	10.83 (M: 4.28 [2.97 – 5.01]; F: 6.46 [3.27 – 7.28])	3 (1M, 2F)	3.70 (M: 1.23 [0.97 – 1.42]; F: 2.46 [1.72-2.83])	109 (26M, 83F)	11.97 (M: 2.85 [2.01 – 3.24]; F: 9.12 [6.83 – 13.44])	372	12.91 (8.81 – 15.57)
Married	747 (312M, 435F)	65.29 (M: 27.27 [24.23 – 30.01]; F: 38.02 [31.07 – 44.67])	65 (26M, 39F)	80.24 (M: 32.09 [28.07 – 36.92]; F: 48.14 [42.16 – 54.11]	606 (155M, 451F)	66.59 (M: 17.03 [12.07 – 20.01]; F: 49.56 [42.32 – 55.84]	1840	63.88 (59.91 – 72.83)
Never married	150 (46M, 104F)	13.11 (M: 4.02 [2.12 – 4.95]; F: 9.09 [7.68 – 11.21])	7 (7F)	8.64 (4.77 – 9.68)	122 (35M, 87F)	13.40 (M: 3.84 [1.87 – 4.33]; F: 8.90 [5.25 – 11.27]	438	15.21 (12.87 – 18.91)
Widow/er	79 (11M, 68F)	6.91 (M: 0.96 [0.42 – 1.12]: F: 5.94 [3.98 – 7.28])	5 (5F)	6.17 (3.23 – 8.05)	32 (3M, 29F)	3.51 (M: 0.32 [0.27 – 0.63]; F: 3.18 [1.24 – 6.23])	145	5.03 (2.25 – 7.32)
Divorced	16 (7M, 9F)	1.39 (M: 0.61 [0.32 – 0.84]; F: 0.78 [0.44 – 0.92])	-	-	9 (2M, 7F)	0.98	30	1.04
Separated	3 (1M, 2F)	0.26 (M: 0.08 [0.04 – 0.09]; F: 0.17 [0.12 – 1.02])	-	-	1 (1F)	0.11 (0.08 – 0.21)	11	0.38 (0.13 – 0.52)
Cohabiting	-	-	-	-	1 (1M)	0.11 (0.09 – 0.15)	7	0.24 (0.19 – 0.37)
Unknown	25 (8M, 17F)	2.18 (M: 0.70 [0.32 – 0.84];	1 (1F)	1.23 (1.10 – 1.47]	30 (7M, 23F)	3.29 (M: 0.76 [0.52 – 1.13]; F:	37	1.28 (1.14 – 1.42)

		F: 1.48 [0.97 – 1.73])				2.52 [1.93 – 2.83]		
Education level								
No formal education	94 (16M, 78F)	8.21 (M: 1.39 [0.72 – 1.51]; F: 6.81 [4.21 – 7.89])	8 (3M, 5F)	9.87 (M 3.70 [1.28 – 5.03]; F 6.17 [3.11 – 8.13])	59 (13M, 46F)	6.48 (M 1.42 [1.12 – 2.11]; F 5.05 [2.15 – 8.01])	200	6.94 (4.47 – 8.83)
Primary	186 (74M, 112F)	16.25 (M: 6.46 [4.32 – 9.48] F: 9.96 [7.82 – 11.02])	19 (6M, 13F)	23.45 (M: 7.41 [5.32 – 9.44]; F: 16.04 [12.43 – 20.95])	107 (30M, 77F)	11.75 (M 3.29 [1.19 – 5.83]; F 8.46 [7.72 – 10.02])	607	21.07 (18.98 – 24.74)
Secondary	675 (274M, 401F)	59 (M: 23.95 [20.03 – 27.88]; F: 35.05 [30.04 – 38.73])	36 (12M, 24F)	44.44 (M: 14.81 [12.93 – 17.57]; F: 29.63 [21.76 – 34.65])	548 (139M, 409F)	60.22 (M 15.27 [11.34 – 18.55]; F 44.94 [38.91 – 47.87])	1733	60.17 (54.54 – 71.83)
Tertiary	165 (57M, 108F)	14.42 (M: 4.98 [3.32 – 6.08]; F: 9.44 [6.47 – 12.03])	17 (5M, 12F)	20.98 (M: 6.17 [4.54 – 8.98]; F: 14.81 [10.23 – 17.87])	176 (42M, 134F)	19.34 (M 4.61 [2.32 – 7.72]; F 14.72 [10.08 – 16.38])	265	9.20 (6.71 – 12.23)
Other	11 (6M, 5F)	0.96 (M: 0.52 [0.33 – 0.81]; F: 0.44 [0.17 – 0.73])	1 (1M)	1.23 (0.72 – 1.45)	12 (2M, 10F)	1.31 (M 0.21 [0.19 – 0.42]; F 1.09 [0.88 – 1.34])	39	1.35 (0.76 – 1.89)
Unknown	13 (7M, 6F)	1.14 (M: 0.61 [0.33 – 0.87]; F: 0.52 [0.24 – 0.77])	-	-	8 (3M, 5F)	0.87 (M 0.32 [0.11 – 0.64]; F 0.55 [0.27 – 0.71])	36	1.25 (0.92 – 1.41)
Occupation								
Employed	765 (318M, 447F)	66.87 (M: 27.7 [23.02 – 31.75]; F: 39.07 [33.07 – 43.13])	49 (20M, 29F)	60.49 (M: 24.69 [18.13 – 28.76]; F: 35.80 [29.43 – 41.12])	626 (180M, 446F)	68.79 (M: 19.78 [15.47 – 22.03]; F: 49.01 [43.43 – 54.65])	1846	64.09 (59.01 – 67.58)
Business	-	-	-	-	-	-	3	0.10 (0.07 – 0.13)
Student	23 (7M, 16F)	2.01 (M: 0.61 [0.36 – 0.93]; F: 1.39 [1.15 – 1.77])	-	-	32 (8M, 24F)	3.51 (M: 0.88 [0.54 – 1.23]; F: 2.64 [1.12 – 3.07])	96	3.33 (1.34 – 5.67)

Trader	1 (1F)	0.08 (0.01 – 0.10)	-	-	1 (1F)	0.11 (0.07 – 0.14)	-	-
Retired	11 (5M, 6F)	0.96 (M: 0.43 [0.15 – 0.78]; F: 0.52 [0.38 – 0.84])	3 (3F)	3.70 (1.32 – 5.62)	3 (2M, 1F)	0.33 (M: 0.22 [0.10 – 0.39]; F: 0.11 [0.09 – 0.35])	1	0.03 (0.01 – 0.05)
Unemployed	328 (97M, 231F)	28.67 (M: 8.48 [6.32 – 12.09]; F: 20.19 [17.31 – 22.72])	28 (7M, 21F)	34.56 (M: 8.64 [3.33 – 9.74]; F: 25.92 [17.82 – 27.94])	235 (37M, 198F)	25.82 (M: 4.07 [1.34 – 6.77]; F: 21.75 [19.35 – 24.33])	896	31.11 (26.87 – 37.78)
Unknown	16 (7M, 9F)	1.39 (M: 0.61 [0.32 – 0.91]; F: 0.78 [0.44 – 0.96])	1 (1F)	1.23 (0.94 – 1.47)	13 (3M, 10F)	1.42 (M: 0.33 [0.14 – 0.73]; F: 1.09 [0.97 – 1.37])	38	1.32 (0.90 – 1.64)
Total	1144	100	81	100	910	100	2880	100

Predictors of non-communicable diseases among PLHIVs on ART in Enugu, Nigeria

The table below presents the predictors of non-communicable disease among PLHIVs on ART in the study area. The significant predictors were age, marital status, education level and being unemployed. The findings of the present study revealed no association between gender and prediction of any known NCD in the sample study population. However, study participants of age 41 – 60 were 4.47 times more likely of developing hypertension, found to be significantly different ($p < 0.05$), than any other NCD in this cohort study. Moreso, female participants aged 21 – 40 and 41 – 60 were 3.37 and 2.44 times more likely to develop cervical cancer than any other age group in the cohort respectively. These were observed to be significantly different at the 95% confidence interval. Similarly, being married predicted the likelihood of developing any known NCD except cervical cancer in this cohort study, with values found to be significantly different ($p < 0.05$). Interestingly, being widowed was shown to be 2.38 times more likely to predict onset of diabetes in participants on ART regardless of gender and age. This was also found to be significantly different ($p < 0.05$). Furthermore, secondary school education was shown to be 4.52 and 2.55 times more likely to predict development of hypertension and diabetes respectively in the study participants indicating a significant difference in this likelihood of NCD onset in the study cohort. In the same vein, being unemployed was 3.72 times more likely to predict onset of hypertension among PLHIVs on ART in the study cohort in the study area. This was observed to be significantly different ($p < 0.05$).

Table 2. Predictors of NCDs among PLHIVs on ART in Enugu, Southeast Nigeria

Variable	Hypertension		Diabetes		Obesity		Cervical cancer	
	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Gender								
Female	3.11 (1.05 – 4.71)	0.07	2.32 (1.15 – 3.57)	0.95	1.23 (1.01 – 3.84)	0.47	12.03 (8.48 – 14.23)	0.82
Male	1.22 (0.93 – 2.25)	0.92	1.03 (0.88 – 4.11)	0.12	0.85 (0.33 – 1.42)	0.35	-	-
Age								
0-20	1.32 (0.34 – 1.87)	0.63	-	-	1.13 (0.81 – 1.72)	0.08	2.32 (1.07 – 3.54)	0.05
21-40	3.12 (1.57 – 4.02)	0.57	2.24 (1.38 – 3.07)	0.09	0.73 (0.54 – 1.21)	0.43	3.37 (2.03 – 4.19)	0.01
41-60	4.47 (3.32 – 6.18)	0.03	1.11 (0.91 – 1.35)	0.07	0.96 (0.33 – 1.02)	0.67	2.44 (1.79 – 3.43)	0.03
61-80	1.07 (0.94 – 2.22)	0.92	1.08 (0.83 – 1.17)	0.55	0.12 (0.06 – 0.53)	0.17	-	-
81-100	0.12 (0.06 – 0.24)	0.15	-	-	-	-	-	-
Marital status								
Single	2.34 (1.03 – 4.32)	0.12	2.55 (1.23 – 4.05)	0.11	1.39 (1.09 – 2.54)	0.24	2.57 (1.32 – 4.84)	0.42
Married	3.72 (1.17 – 5.17)	0.03	3.57 (1.18 – 4.40)	0.03	3.42 (1.15 – 5.32)	0.02	1.56 (0.77 – 1.94)	0.21
Never married	1.03 (0.82 – 2.17)	0.52	1.17 (0.92 – 2.33)	0.83	1.19 (0.87 – 2.03)	0.49	0.43 (0.16 – 1.03)	0.07
Widow/er	2.44 (1.14 – 3.05)	0.14	2.38 (1.29 – 3.52)	0.04	2.05 (1.12 – 4.34)	0.08	1.35 (1.01 – 2.14)	0.10
Divorced	1.13 (0.73 – 1.54)	0.23	-	-	1.37 (1.01 – 2.34)	0.51	2.32 (1.42 – 2.56)	0.40
Separated	0.79 (0.09 – 2.11)	0.48	-	-	2.67 (1.04 – 4.45)	0.92	1.25 (1.01 – 1.78)	0.06
Cohabiting	-	-	-	-	1.24 (0.98 – 1.53)	0.11	2.17 (1.40 – 3.84)	0.08
Unknown	2.53 (1.17 – 3.74)	0.57	1.54 (1.23 – 2.41)	0.91	2.33 (1.08 – 3.11)	0.72	1.33 (1.02 – 2.04)	0.10
Education level								
No formal education	0.72 (0.43 – 0.98)	0.14	1.21 (0.94 – 2.12)	0.07	0.13 (0.09 – 1.30)	0.23	0.23 (0.09 – 1.14)	0.12
Primary	1.13 (0.65 – 1.57)	0.39	0.53 (0.31 – 0.74)	0.47	0.77 (0.32 – 1.01)	0.40	0.14	0.31
Secondary	4.52 (3.34 – 5.94)	0.02	2.55 (1.97 – 3.02)	0.03	2.11 (1.05 – 2.78)	0.14	1.03 (0.59 – 2.02)	0.63

Tertiary	2.35 (1.56 – 3.01)	0.51	1.01 (0.75 – 1.32)	0.71	1.79 (1.07 – 2.33)	0.19	0.71 (0.33 – 0.92)	0.44
Other	1.47 (1.11 – 1.93)	0.06	2.33 (1.03 – 3.32)	0.32	2.13 (1.77 – 2.54)	0.09	1.13 (0.82 – 1.58)	0.09
Unknown	0.52 (0.21-0.88)	0.30	-	-	1.17 (0.83 – 1.45)	0.62	0.56 (0.23 – 1.98)	0.11
Occupation								
Employed	3.44 (1.23 – 3.72)	0.05	2.36 (1.47 – 3.14)	0.89	1.47 (1.01 – 2.03)	0.05	0.37 (0.11 – 0.78)	0.51
Business	-	-	-	-	-	-	0.35 (0.14 – 0.53)	0.07
Student	0.95 (0.31 – 1.02)	0.09	-	-	0.14 (0.09 – 1.33)	0.08	1.12 (0.78 – 1.74)	0.32
Trader	0.12 (0.07 – 0.42)	0.14	-	-	0.31 (0.24 – 0.59)	0.06	-	-
Retired	0.78 (0.49 – 1.12)	0.68	2.33 (1.37 – 4.32)	0.34	1.05 (0.32 – 1.82)	0.13	1.12 (0.11 – 2.49)	0.73
Unemployed	3.72 (1.32 – 3.08)	0.01	1.14 (1.03 – 3.04)	0.22	2.32 (1.03 – 3.43)	0.71	0.32 (0.14 – 0.83)	0.48
Unknown	2.11 (1.42 – 3.14)	0.70	0.57 (0.12 – 0.92)	0.08	1.17 (0.72 – 2.01)	0.06	1.46 (0.97 – 3.07)	0.07

Discussion

The study profiled the socio-demographic characteristics of the participants in the study area highlighting the importance of the social and economic determinants in influencing the risk for development of NCDs and its prevalence. From the findings, females (86.2%) were more than males (13.8%) in the abstracted data of PLHIVs on ART with 62.1% (95% CI: 58.76 – 67.71) representing their total number of females in the research study. Stratified by NCD, the data revealed more females in the cohort than the males. This trend could be explained by the fact that the health-seeking behaviour of men in the study area may be an underlying factor for the low turn-out of men for help concerning their health issues. Health-seeking behaviours of individuals go a long to enable proper documentation of debilitating ailments as well as facilitate enhanced treatment protocols for the individuals. Marital status has been shown to be an important indicator in the health outcomes of HIV-affected individuals as spousal support can drastically improve adherence to treatment regimens, clinic visits and increased laboratory testing for any comorbidities. In the current study, married participants for any NCD group were observed to be more in the present cohort of participants indicating that support from spouses can increase reporting of NCD/HIV comorbidity and thus improve quality of life. Education level has been demonstrated to inform one's health decisions, seeking behaviour and lifestyle choices. In Nigeria, the basic education is at the secondary level and most participants had up to secondary education highlighting the importance of literacy in aiding individuals to make informed decisions about their health and lifestyle choices.

Gender has been noted to be a socioeconomic determinant of health as

reported by several studies. These studies have revealed that women are more vulnerable to the risk of obesity, heart disease, stroke, different forms of cancer when compared to men. In this study, female gender (AOR 2.15; 95% CI: 1.47 – 3.22) was significantly associated with obesity risk comorbidity as similarly reported by [16] among PLHIVs in Zimbabwe as they were found to be 2.15 times more likely to develop obesity from the pooled data. More significantly, females in the age range of 18 – 55 years were also associated with obesity risk than in any other age group indicating the fact that women of reproductive age are predisposed to the biochemical interplay of events that result in weight gain and hormonal imbalance resulting in onset of certain diseases associated with women. Contrary to studies [16, 17] that observed that men on ART were more likely to develop high blood pressure, this study revealed that women (AOR 3.23; 95% CI: 1.37 – 3.55) were found to be 3.23 times more likely to develop risk of systolic blood pressure than their male counterparts. However, this finding is similar to study findings conducted in South Africa and India where more females were found to be disproportionately affected by NCDs compared to males [18]. Additionally, [19] also found that systolic blood pressure, fasting blood sugar, and low-density lipoprotein were found to be significantly lower in Indian women.

Age was also implicated as a risk factor in NCD development in PLHIVs on ART highlighting the importance and impact of age on one's health regardless of HIV status. The current study found that 40.5% of the patients between the ages of 41-50 years enrolled in the ART programme are at risk of hypertension. Findings of the study such as increased prevalence of high blood pressure, obesity among PLHIV initiated on ART concur with [20], who postulated that an increase in age is a critical determinant of traditional risk factors and the role it plays in relation to CVD events. Several studies revealed similar trends in Africa and globally [18, 21].

Similarly, a study conducted in Tanzania by [22] showed that older age (AOR = 3.42, 95% CI 2.06–5.70) was a risk factor that predicted the prevalence of hypertension among participants on ART [23, 22] which concurs with findings from the current study as it was revealed that increase in age or older age was 1.6 times more likely to be predispose study participants to hypertension ($p < 0.005$). [22] further observed that hypertension significantly associated with ART regimens Dumiva and alluvia and this concurs with studies conducted in Zimbabwe and Tanzania [22, 16]. Again, similar to a study conducted in North-western Tanzania and Southern Uganda [22, 24], there was a significant association between hypertension and age. Additionally, the male gender has been found to be significantly associated with smoking (AOR = 22.5, 95% CI 7.8–64.7) and alcohol consumption (OR = 4.0, 95% CI 2.1–7.7) in ART patients in several studies (da Silva et al., 2017), which have been observed to be significant predictors of hypertension in PLHIVs on ART.

Conclusion

The findings from this study are important to inform health care and training, resource and research priorities and also to establish how non-communicable disease risk factors vary amongst HIV positive population. As the continent and particularly the study area is facing intersecting epidemics of HIV and hypertension, it is essential to address the occurrence of NCDs and their risk factors with an aim to achieve positive effects of the long-term ART use. As adverse effects are markedly noted with HIV treatment on lipids, this may have serious implications for context-specific health care system which is burdened by HIV epidemic. Therefore, monitoring of the interaction of HIV, ART use, and non-communicable diseases is needed at both individual and population levels. This can be

achieved by strengthening interventions and services which will lead to the integration of HIV/AIDS and NCDs programme or services with other health services and interventions or programs in both urban and rural areas alike.

Recommendations

Our findings suggest an empirical support for an integrated all-inclusive approach to addressing the socio-economic determinants of HIV-positive individuals. It emphasizes the need for interventions that can be designed and implemented to reach PLHIVs of all socio-economic strata as well as benefitting other population groups at risk for NCDs. Beyond treatment intervention strategy, it is also suggested that health promotion and programs for NCD socio-demographic risk factors be strengthened in order to achieve reduction in mortality rates associated with NCDs among PLHIVs. Further, the need for comprehensive health programs that will focus on screening and treatment of HIV and NCD tailored alongside patient demographics can be instituted.

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References

[1]. WHO, 2021, in HIV, Estimated number of people (all ages) living with HIV 2023 [Available from: .

[2]. National Agency for the control of AIDS 2011, Update on the HIV/AIDS epidemic response in Nigeria.

[3]. Coetzee, L., Bogler, L., De Neve, J-W., Barnighausen, T., Geldsetzer, P., and Vollmer, S., 2019, HIV, antiretroviral therapy and non-communicable diseases in sub-Saharan Africa: empirical evidence from 44 countries over the period 2000 to 2016. *J. Int. AIDS Soc.* 22(7), e25364.

[4]. WHO, Noncommunicable diseases 2017, *World Health Organization.*

[5]. Jadeja, S., Pai, G., Bhat, K., and Sathyanarayana, M. B., 2018, President's emergency plan for AIDS relief. *Syst Rev Pharm.*, 9(1):6–9.

[6]. Bor, J., Herbst, A. J., Newell, M-L., and Barnighausen, T., 2013, Increases in adult life expectancy in rural South Africa: valuing the scale-up of HIV treatment. *Science*, 3396122:961–965.

[7]. Achwoka, D., Oyugi, J. O., Mutave, R., Munywoki, P., Achia, T., Akolo, M., Muriuki, F., Muthui, M., and Kimani, J., 2020, High prevalence of non-communicable diseases among key populations enrolled at a large HIV prevention & treatment program in Kenya. *PLoS One*, 15(7), e0235606.

[8]. Feinstein, M. J., Hsue, P. Y., Benjamin, L. A., Bloomfield, G. S., Currier, J. S., Freiberg, M. S., Grinspoon, S. K., Levin, J., Longenecker, C. T., Post, W. S., and American Heart Association Prevention Science Committee of the Council on Epidemiology and Prevention and Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; and Stroke Council. 2019. Characteristics, prevention, and management of cardiovascular disease in people living with HIV: a scientific statement from the American Heart Association. *Circulation*, 140(2), e98-e124.

[9]. Seang, K., Javanbakht, M., Lee, S-J., Brookmeyer, R., Pheng, P., Chea, P., Saphonn, V., and Gorbach, P. M., 2022, Differences in prevalence and risk factors of non-communicable diseases between young people living with HIV (YLWH) and young general population in Cambodia. *PLoS ONE* 17(6), e0269989

[10]. Kansiime, S., Mwesigire, D., & Mugerwa, H., Prevalence of non-communicable diseases among HIV positive patients on antiretroviral therapy at joint clinical research centre, Lubowa, Uganda. *PLoS ONE* 14(8), e0221022 2019.

[11]. Thet, D., and Siritientong, T., 2020, Antiretroviral therapy-associated metabolic complications: Review of the recent studies. HIV/AIDS – Res. *Palliative Care* 12, 507–524. .

[12]. Gausi, B., Otiku, P., Jacob, N., & Oni, T., Patient outcomes in integrated HIV and non-communicable disease models of care: A scoping review. *J. Global Health Rep*. 5, e2021084 2021.

[13]. Okeke, F. O., Sam-Amobi, C. G., & Okeke, F. I., 2020, Role of local town planning authorities in building collapse in Nigeria: evidence from Enugu metropolis. *Heliyon*, 6(7), e04361.

[14]. Ezeala-Adikaibe, B., Aneke, E., Orjioke, C., Ezeala-Adikaibe, N., Mbadiwe, N., Chime, P., & Okafor, U., 2014, Pattern of medical admissions at Enugu state University of Science and Technology Teaching Hospital: a 5-year review. *Annals of medical and health sciences research*, 4(3), 426–431.

[15]. Abugu, J. O., Chukwu, A. M., Onyeso, O. K., et al., 2023, Determinants of the managerial staff's disposition towards e-payment platforms in public tertiary hospitals in Enugu, Nigeria: a cross-sectional study. *BMC Health Serv Res* 23, 1240.

[16]. Magodoro, I. M., Esterhuizen, T. M., Chivese, T., 2016, A cross-sectional, facility-based study of comorbid non-communicable diseases among adults living with HIV infection in Zimbabwe. *BMC Res Notes*, 9(1):379.

[17]. Achwoka, D., Waruru, A., Chen, T. H., Masamaro, K., Ngugi, E., Kimani, M., Mukui, I., Oyugi, J.O., Mutave, R., Achia, T., Katana, A., Ng'ang'a, L., and De Cock, K. M., 2019, Noncommunicable disease burden among HIV patients in care: a national retrospective longitudinal analysis of HIV-treatment outcomes in Kenya, 2003-2013. *BMC Public Health*, 3;19(1):372.

[18]. Mathebula, R. L., Maimela, E., & Ntuli, N. S., 2020, The prevalence of selected non-communicable disease risk factors among HIV patients on anti-retroviral therapy in Bushbuckridge sub-district, Mpumalanga province. *BMC Public Health* 20, 247, https://doi.org/10.1186/s12889-019-8134-x.

[19]. Anish, T. S., Shahulhameed, S., Vijayakumar, K., Joy, T. M., Sreelakshmi, P. R., Kuriakose, A., 2013, Gender Difference in Blood pressure, Blood Sugar, and Cholesterol in Young Adults with Comparable Routine Physical Exertion. *J Family Med Prim Care*, 2(2):200-203. doi: 10.4103/2249-4863.117424.

[20]. Bogorodskaya, M., Chow, F. C., Triant, V. A., 2013, Stroke in HIV. *Canadian Journal of Cardiology*, 35(3), 280-287.

[21]. Tate, T., Willig, A. L., Willig, J. H., Raper, J. L., Moneyham, L., Kempf, M. C., Saag, M. S., Mugavero, M. J., 2012, HIV infection and obesity: where did all the wasting go? *Antivir Ther.* 17(7):1281.

[22]. Kagaruki, G. B., Mayige, M. T., Ngadaya, E. S., Kimaro, G. D., Kalinga, A. K., Kilale, A. M., Kahwa, A. M., Materu, G. S., and Mfinanga, S. G., 2014, Magnitude and risk factors of non-communicable diseases among people living with HIV in Tanzania: a cross-sectional study from Mbeya and Dar es Salaam regions. *BMC Public Health*, 14(1):904.

[23]. Braithwaite, R. S., Conigliaro, J., McGinnis, K. A., Maisto, S. A., Bryant, K., and Justice, A. C., 2008, Adjusting alcohol quantity for mean consumption and intoxication threshold improves prediction of nonadherence in HIV patients and HIV-negative controls. *Alcohol Clin Exp Res.*, 32(9):1645–51.

[24]. Justice, A., Sullivan, L., and Fiellin, D., 2010, Veterans Aging Cohort Study Project Team. HIV/AIDS, comorbidity, and alcohol: can we make a difference? *Alcohol Res Health*, 33(3):258.

[25]. da Silva, C. M., Mendoza-Sassi, R. A., da Mota, L. D., Nader, M. M. and de Martinez, A. M., 2017, Alcohol use disorders among people living with HIV/AIDS in Southern Brazil: prevalence, risk factors and biological markers outcomes. *BMC Infect Dis.*, 17(1):263.

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Effectiveness of a Theory-Based Health Education on Intention to Delay Next Pregnancy using Long-Acting Contraceptives (LARC) Among Women Attending Antenatal Clinics in Katsina State, Nigeria

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Abstract

Pregnancies conceived after a short interval within less than 2 years of deliver are associated with increase health risks for both mothers and the child. A large number of women in developing countries would like to delay or stop childbearing but are not using any method of contraception due to limited choice of methods A randomized controlled trial was conducted involving 685 women attending selected antenatal clinics across Katsina State, Nigeria to determine effectiveness of a theory-based health education intervention on women's intention to delay next pregnancy using Long-Acting Reversible Contraceptives (LARC). Data was collected at baseline and six months post-intervention using a validated questionnaire. Data was analyzed using SPSS version 26. Descriptive analysis was performed first to explore the baseline characteristics of the respondents as well as to explore their socio-demographic and reproductive and obstetric history. Findings reveal significant improvements in intention to utilize LARCs post-intervention, suggesting that theory-driven education can effectively bridge the gap between knowledge and practice in contraceptive uptake. Limitations include potential self-reporting bias and loss to follow-up which might affect generalizability. However, the large sample size, rigorous methodology, and strong statistical significance enhance the reliability of the findings.

Keywords: *Antenatal Care, Contraceptive Intention, Health Belief Model Health Education, Katsina State, Long-Acting Reversible Contraceptives*

Introduction

Even though Long-Acting Reversible Contraceptives (LARCs) have been proven to be safe and efficient in preventing unintended pregnancies, their usage is still very low especially in Africa [1]. A number of multiple and complex barriers which include cost, providers' competence and knowledge have been identified to investigated for as factors resulting in the low utilization [1-3]. LARC uptake in Nigeria remains low [4] with usage rates of just 0.2% for IUDs and 2.2% for implants in Katsina State [5].

Unintended pregnancies decrease educational and career opportunities, may contribute to socioeconomic deprivation and wide disparity in income. Long-acting reversible contraception (LARC) provide opportunity to change unplanned pregnancy and parenthood to planned pregnancy or conception. LARC methods are unforgettable and once inserted provides highly effective and long-term contraception. Increasing evidence However, barriers to more widespread use of LARC methods persist and include knowledge and access [6].

Pregnancies conceived after a short interval within less than 2 years of deliver are associated with increase health risks for both mothers and the child [7]. A large number of women in

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developing countries would like to delay or stop childbearing but are not using any method of contraception due to limited choice of methods; limited access to contraception; fear or experience of side-effects; cultural or religious opposition and poor quality of available services [8]. This study evaluated the effectiveness of a Theory based health education intervention on improving intention to delay next pregnancy using LARC among women attending antenatal clinics in Katsina State.

Materials and Methods

A randomized controlled trial was conducted involving 685 women attending antenatal care in selected health facilities across Katsina State. A multi stage cluster sampling method was used with each of the primary health center serving as cluster. Participants were assigned randomly assigned to either an intervention group which received a structured theory-based health education module grounded in the HBM or a control group which received on health education on immunization and breastfeeding. Data was collected at baseline, 3 months and six months post-intervention using a validated questionnaire. The sample size for this study was calculated using the two proportions formula (Lwanga & Lemeshow, 1991) and the estimated sample size was 346 for the Intervention and Control group.

The inclusion criteria for the study was pregnant women between the ages of 15-49 years attending ante-natal clinics in a primary health centre irrespective of marital status, women who have never used any LARC method before, women who have no any medical, psychological, Obstetric or Gynecological conditions that are considered as contra-indicated (WHO guideline) to the use of LARC and women who are indigenes of Katsina State and reside in the respective ward/wards being served by the corresponding primary health centre. While the Exclusion Criteria for the study include women less than the ages of 15 years irrespective of marital status, women who were using LARC method prior to index pregnancy and are willing to continue, women with any condition (medical, psychological, Obstetric and Gynecological) that makes use of LARC contra-indicated (WHO guideline) and pregnant women that came to the who do not reside in Katsina were also excluded from the study.

Data was analyzed using SPSS version 26. Descriptive analysis was performed first to explore the baseline characteristics of the respondents as well as to explore their reproductive and obstetric history. Chi-square test was performed to explore the homogeneity of participants' socio-demographic at baseline between the health education intervention and the control groups. McNemar's test was conducted to assess the effect of Health education intervention on intention to utilize LARC; Mixed design repeated measures ANOVA was conducted to explore the difference between and within group pre and post intervention as well as interactions.

Results

Response Rate

Seven Hundred and Ninety-Six (796) were enrolled into the study with 398 participants in each arm of intervention and control groups. Of these, 56 participants were lost to follow-up at two months; 31 among the intervention group and 26 among the control group. The response rate at two months was 92.9% overall with 92.2 % and 93.5% for intervention and control groups respectively. Similarly, the response rate at six months was 86.1% overall with 85.1% and 86.9% for intervention and control groups respectively. Figure 1 below shows the participant recruitment process until the end of the study.

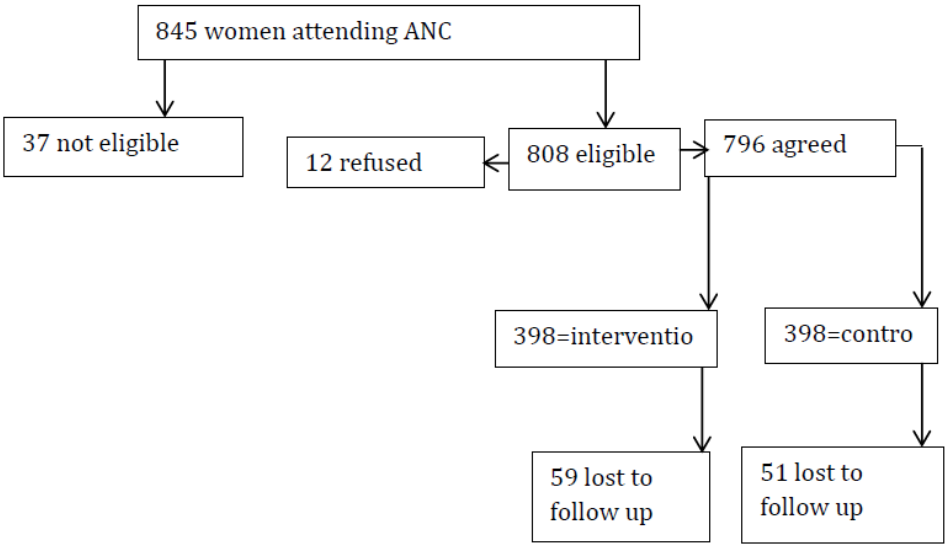

Figure 1. Flow Chart of Recruitment of Respondents

Reproductive and Obstetric History

Table 1 below shows reproductive and obstetric history of respondents. Majority of responds were married between 20-29 years of age (79.7%). Almost half of the respondents 168 (49.6%) in the intervention group and 182 (52.6%) of respondents in the intervention groups were gravida 1-3. Majority of the respondent 248(53.1%) in the intervention and 245(70.8%) of respondent have desired to have 5-8 children. Majority of the respondents both in the intervention and control group had their first delivery with the age group of 20-29yeras (53.1% and 60.4% respectively).

Majority of the respondents 263 (77.6%) in the intervention and 268 (77.5) in the control group have previous history of contraceptive use. However, only 7.9% (5.4% and 2.5%) in the intervention and control group respectively used LARC. More than ninety percent (92.8%) of the respondents had no history of abortion.

Table 1. Reproductive and Obstetric History of Participants (n=685)

Variables	**Frequency and Percentage (%)**				
	Intervention	**Control**	**Total**	**Type of test (value)**	**p-value**
Age at first marriage (years)					
15-19	30 (8.8)	23 (6.6)	53 (7.7)	$\chi 2$ (7.040)	0.030
20-29	280 (82.6)	266 (76.9)	546 (79.7)		
30-39	29 (8.6)	57 (16.5)	86 (12.6)		
No of pregnancy including index					
1-3	168 (49.6)	182 (52.6)	350 (51.1)	$\chi 2$ (4.950)	0.084
4-6	98 (28.9)	112 (32.4)	210 (30.7)		
7 and above	73 (21.5)	52 (15.0)	52 (18.2)		
No. of Deliveries					
0-4	252 (60.5)	221 (63.9)	473 (69.1)	$\chi 2$ (4.961)	0.030
Above 4	134 (39.5)	125 (36.1)	259 (37.8)		
No of living children					
1-4	231 (68.1)	245 (70.8)	476 (69.5)	$\chi 2$ (4.012)	0.045
More than 4	108 (31.9)	101 (25.7)	209 (30.5)		

Desired family size					
1-4	48(14.4)	61(17.9)	109 (16.1)	$\chi 2$ (1.620)	0.445
5-8	248 (53.1)	245(26.6)	245 (71.8)		
More than 8	38 (11.4)	35 (10.3)	73910.8)		
Abortion history					
No	324 (95.6)	312 (90.2)	636 (92.8)	$\chi 2$ (7.523)	0.006
Yes	15 (4.4)	34 (9.8)	49 (7.2)		
Contraceptive use history					
No	263 (77.6)	268 (77.5)	137 (20.0)	$\chi 2$ (11.720)	0.008
Yes	76 (22.4)	78 (22.5)	551 (80.0)		
Method of contraception used					
LARC(Implant)	19 (5.6)	18 (5.2)	37 (5.4)	$\chi 2$ (8.907)	0.063
LARC(IUD)	11 (3.2)	6 (1.7)	17 (2.5)		
None	76 (22.4)	110 (31.8)	186 (27.2)		
Short acting	217 (64.0)	200(57.8)	417 (60.9)		
Traditional method	16 (4.9)	12 3.5)	28 4.1)		

Change in Intention to Delay Next Pregnancy from baseline to three-month and six-month post-intervention in Intervention and Control Group

Result of McNemar's test shows that there was a significant increase in the proportion of those intending to delay next pregnancy following intervention from three month to six-month post intervention among intervention group (*p*-value <0.001) as indicated in Table 2 below. However, the participants in the control group shows no significant increase in the proportion of those intending to delay next pregnancy from baseline to three-month and three months to six months post intervention (*p*-value =0.250; 0.230; 0.303) respectively.

Table 2. Change in intention to delay next pregnnacy following intervention in Intervention (N=339) and control group (N=346)

Variables	**Frequency (n) and Percentage (%)**			
	Time 1	**Time 2**	**Change**	**p-value**
Intervention group				
	Baseline	3 Month post		
Yes	236 (69.6)	255 (75.2)	5.6	0.001*
No	103(30.4)	84 (24.8)		
	Baseline	6 Months post		
Yes	236 (69.6)	283 (83.5)	13,9	0.001*
No	103(30.4)	56 (16.5)		
	3 Month post	6 Months post		
Yes	25 (75.2)	283 (83.5)	8.3	0.001*
No	84 (24.8)	56 (16.5)		
Control group				
	Baseline	3 Months post		
Yes	226 (65.3)	227 (65.6)	0.3	0.250
No	120 (34.7)	119 (34.4)		

	Baseline	6 Months post		
Yes	226 (65.3)	226 (65.3)	0.0	0.230
No	120 (34.7)	120 (34.7)		
	3 Months post	6 Months post		
Yes	227 (65.6)	226 (65.3)	-0.3	0.303
No	119 (34.4)	120 (34.7)		

*p-value was calculated using McNemar's test. *Significant at <0.05*

Effect of Group, Time and their Interaction on Intention to Delay Next Pregnancy

A mixed design ANOVA on intention to delay next pregnancy revealed significant main effects on time and group as well as time*group interaction as shown in table 3 below. Knowledge scores changed significantly across the time points. The intervention group were willing to delay next pregnancy than the control group (F (1, 678) = 1812.114, *p*-value <0.001, η^2 = 0.726). Moreover, there was statistically significant interaction between time and group (F (2, 1366) = 37.928, *p*-value <0.001, η^2 = 0.57) shown in Table 3 indicting that intention to delay next pregnancy increase over time differently for the two groups.

This indicate that educational intervention changes intention to delay next pregnancy that was sustained at 6 months whereas the control group showed no improvement in unchanged finding means that the intervention and control groups exhibited intention differently pre and post intervention.

Table 3. Summary table of repeated measures ANOVA for mean LARC knowledge scores (Within and Between Group)

Source Variable						
LARC knowledge scores	**Type III sum of squares**	**df**	**Mean square**	**F**	**p-value**	**Partial Eta η2**
Within Group						
Time	1.740	2	0.870	41.403	<0.001*	0.57
Group*time	1.594	2	0.797	37.928	<0.001*	0.53
Error (time)	28.700	1366	0.21			
Between Group						
Group	5.872	1	1028.83	1812.1	<0.001*	0.726
Error	387.775	638	0.568			

Note: (*) – significant p< 0.05

Discussion

The Study assessed the effectiveness of theory-based health education intervention on intention to delay next pregnancy among women attending antenatal care in Katsina State, Nigeria. Finding of the study there is significant improvement in intention to delay next pregnancy among women in the intervention group which was sustained six months post women. The findings were similar to the findings of a study conducted based on national data in India to assess desire to delay first delivery among married women which shows that women with higher education (28.8%, $p < 0.01$); women with high income (23.4%, $p < 0.01$) and those exposed to family planning (22.7%, $p < 0.01$) were more likely to wait longer for the birth of their first child [9]. The findings were also similar to findings from a study among women with private insurance to assess How pregnancy intentions affect contraceptive choices when cost for

contraception is not a factor which shows that pregnancy intentions predicted LARC use and other methods modern contraceptive when compared with no method with 8.4% of the respondents using LARC [10].

However, the results contradict that of findings from a study conducted among young women in changing desire for pregnancy in changing relationship dynamics with stated that the desire to have pregnancy increased over time as relationship became more serious and those women with lower education status were less likely to became pregnant that men with equal education status [11].

Conclusion

This study demonstrated that a theory-based health education intervention significantly improves women's intention to delay next pregnancy using LARCs in Katsina State, Nigreia. The findings support the integration of behavioral models, particularly the Health Belief Model, into reproductive health programming to address gaps in contraceptive uptake. Policymakers and program implementers should scale up structured health education campaigns at antenatal clinics to enhance informed contraceptive choices among women.

References

[1]. Bolarinwa, O. A., Nwagbara, U. I., Saeed, B. Q., Mashige, K. P., & Aboagye, R. G., 2021, Prevalence and determinants of long-acting reversible contraceptive use among women in Sub-Saharan Africa. *BMC Women's Health*, 21(1), 1-9.

[2]. Luo, Z., Gao, L., Anguzu, R., *et al.*, 2018, Long-acting reversible contraceptive use in the post-abortion period among women seeking abortion in mainland China: intentions and barriers. *Reprod Health*, 15, 85. https://doi.org/10.1186/s12978-018-0543-2

[3]. Teferi, S. M., Seyoum, K., Ejigu, N., Geta, G., Wedajo, L. F., & Alemu, S. S., 2024, Delayed time to pregnancy and associated factors among pregnant women attending antenatal care in bale zone administrative towns health facilities: multi-center cross-sectional study. *BMC pregnancy and childbirth*, *24*(1), 531. https://doi.org/10.1186/s12884-024-06709-3

[4]. NDHS. 2018, Nigeria Demographic and Health Survey. *National Population Commission & ICF*.

[5]. MICS. 2021, Multiple Indicator Cluster Survey 2021. *National Bureau of Statistics.*

[6]. Parks, C., & Peipert, J. F., 2016, Eliminating health disparities in unintended pregnancy with long-acting reversible contraception (LARC). *American journal of obstetrics and gynecology*, *214*(6), 681-688.

[7]. Harney, C., Dude, A., & Haider, S., 2017, Factors associated with short interpregnancy interval in women who plan postpartum LARC: a retrospective study. *Contraception*, *95*(3), 245-250.

[8]. United Nations Department of Economic and Social Affairs, Population Division. 2015, Trends in Contraceptive use worldwide. (ST/ESA/SER.A/349). UNDFPA, Geneva

[9]. barra-Nava, I., Choudhry, V., & Agardh, A., 2020, Desire to delay the first childbirth among young, married women in India: a cross-sectional study based on national survey data. *BMC public health*, 20(1), 350. https://doi.org/10.1186/s12889-020-8402-9

[10]. Carol S. W., Erik B. L., Richard S. L., Diana, L.V., & Cynthia, H. C., 2015, How do pregnancy intentions affect contraceptive choices when cost is not a factor? A study of privately insured women, *Contraception*,92(5), 501-507. https://doi.org/10.1016/j.contraception.2015.05.007

[11]. Jennifer S. B., Warren, M., Kusunoki, Y., Hayford S. R., & Karen, B. G., 2019, Relationship Dynamics and Changing Desire for Pregnancy Among Young Women. *Perspectives on Sexual and Reproductive Health*, 51(3), 143-152. https://doi.org/10.1363/psrh.12119

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The Impact of Information Technology on Hospital Management Systems

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Abstract

This study examines the significant contribution of IT to improving hospital information system management. They are mainly aimed at assessing how IT applications in hospitals, including Electronic Health Records (EHR), Clinical Decision Support Systems (CDSS), and telemedicine, enhance processes, communication, and patient outcomes. Using quantitative data sources involving performance measurement data, together with qualitative data collected through interviews and observation forms, forms the basis of the research. This study demonstrated its strengths by gathering data from various hospitals using a stratified random sample, enabling a comprehensive comparison of various healthcare facilities. Some of the findings highlighted are the fact that integration has a positive overall impact on the working of the business, reduces office responsibilities, and increases positive effects on patients. Electronic health records simplify patient data entry, allowing for better album handling and more accurate records. CDSS assists the clinician in making the right choices, which in turn helps to improve the quality of care.

Keywords: *Clinical Decision Support Systems (CDSS), Electronic Health Records (EHR), Hospital Management, Information Technology, Patient Outcomes, Performance Measurement, Telemedicine, and User Acceptance.*

Introduction

Electronic Health Records (EHR) can be described as one of the most radical shifts in the sphere of healthcare IT. EHR systems supplant traditional paper charts; patient information is maintained and accessed in electronic form but can also be edited. They allow for real-time access to patient records, overall health records, lab reports, or prescribed treatment plans, and they help the parties involved make better decisions [8]. Progress in telemedicine has provided the means through which patients could receive medical advice and treatments from the comfort of their homes, thus eradicating geographical and logistical hindrances to accessing quality healthcare services [9].

The role of IT in hospital administration cannot be overemphasized. The coordination of actual processes that occur in hospitals requires proper management that focuses on operations such as admission and discharge, treatment, and documentation encompassing billing processes. It is imperative that these processes are improved, coordinated through IT systems, efficient, and, above all, secure. EHR systems, for example, have facilitated a significant reduction in administrative hassles, training, records mistakes, and billing and coding efficiency [10]. This not only boosts operational efficiency but also reduces expenses associated with document development and subsequent manual correction of errors. CDSS may be described as an information technology system that supports healthcare workers in making decisions concerning patients and in determining the appropriate treatment that should be given. CDSS employs the computer patient record enhanced by information technology remotely

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linked to a clinical knowledge base to support timely and right diagnosis by clinicians [5].

The primary purpose of this research is to assess the impact of information technology (IT) on the advancement of hospital management systems. It also intends to learn how IT applications make a positive impact in the areas of operations, patients' care, and hospital effectiveness. In a literature review study, it was found that most of the research focused on specific hospital IT implementations rather than broadly investigating key success factors enabling hospitals to manage comprehensive IT systems [7]. In some cases, it is challenging to search for the records of a specific patient and find the information needed, which means that the search has to be conducted by using paper-based records that have to be updated one by one, including the patient data [4]. Records on paper are vulnerable to physical mutilation and disappearance, which undermines the accuracy of past medical histories and data authenticity.

Materials and Methods

This mixed-methods study combines semi-structured interviews capturing the views of hospital stakeholders on the impact effects of IT with a quantitative analysis of performance data available for measuring and contextualizing fifty impacts accruing from it over time. Combining both qualitative insights and quantified outcome measures allows for methodological triangulation in an effort to probe further into the hypothesized impacts of IT. The interviews give subjective accounts meant to understand the mechanisms driving change. Longitudinal hospital performance metrics then determine if promised benefits were realized and what contextual factors induced the variance.

This research design is highly appropriate for the current investigation, as it combines qualitative and quantitative approaches. This research design therefore employs both subjectivist and positivist approaches so that the hypothesized impacts of IT are fully investigated by considering the sentiments as well as the results of the affected parties. The data collection technique used in this study is stratified random sampling because it will help in developing an effective and representative sample. Stratified random sampling is regarded as the most effective for this type of study, as it provides the highest accuracy and reliability of a survey and the most efficient distribution of resources.

A quantitative and qualitative research design is used in this study; questionnaires, interviews, and observations are used to collect data that will be used in the analysis of IT in hospitals. All these methods have been chosen very carefully in a way that would encompass both numerical and relative data and information about the subject matter. Open-ended and closed-ended questionnaires will be used in the surveys; while easy to analyze, the closed-ended questionnaires may lack depth. Integration entails comparing the results of qualitative and quantitative factors to paint a balanced picture of the effects of IT on hospital management and performance.

Results

The quantitative data collected from the 20 major hospitals therefore required data description and analysis, where basic frequencies and percentages were done through the use of descriptive statistics. As shown in Table 1, the descriptive statistics highlight key performance measures before and after IT implementation, including mortality rate, readmission rate, patient satisfaction, and other operational metrics. By providing mean and standard deviations of different performance indicators before and after the IT implementation, this analysis offered an understanding of the degree of central tendencies and dispersion. Components monitored were knowledge and competence, mortality and readmission, patient satisfaction scores, medication incidents, integrated care,

infection and costs accomplished and stay and waiting times. The results of the descriptive statistics and performance metrics test have a similar conclusion: confirmation and implementation of IT have improved hospitals' performance. Reduced mortality rates as well as decreased readmission rates support ideas of improving patient conditions and overall clinical treatment. Higher scores in patient satisfaction surveys mean that patients are more satisfied with the care they have received, which can be attributed to the implementation and use of IT systems that bring about streamlined operations. Table 2 presents the statistical significance of the changes in performance metrics, confirming that the observed differences are unlikely to be due to chance. The importance of this research in relation to enhancing patient care cannot be overemphasized. Advanced features within an EHR give a healthcare provider the right of entry to full patient histories, thus minimizing medical errors while at the same time improving efficacy in diagnosing as well as in treatment regimens [11]. The availability of real-time data ensures that clients can provide effective care to patients as soon as possible to ensure better results. CDSS tools present choices based on research studies, thus assisting patients and healthcare professionals to select the most appropriate therapy and minimize error rates for adverse events.

Table 1. below summarizes the descriptive statistics highlighting key performance measures before and after IT implementation, including mortality rate, readmission rate, patient satisfaction, and other operational metrics.

Performance Metric	**Mean (Pre-IT)**	**SD (Pre-IT)**	**Mean (Post-IT)**	**SD (Post-IT)**
Mortality Rate (%)	2.5	0.6	2.2	0.5
Readmission Rate (%)	15.0	3.2	13.5	2.9
Patient Satisfaction (%)	78.0	6.5	83.0	5.8
Medication Errors (#)	120	25	85	20
Care Coordination (Score)	70	10	75	8
Infection Rate (%)	1.8	0.4	1.5	0.3
Costs ($M)	12.0	3.5	10.5	2.8
Length of Stay (days)	5.0	1.2	4.5	1.0
Waiting Times (mins)	30	10	25	8

Table 2. presents the statistical significance of the changes in performance metrics, confirming that the observed differences are unlikely to be due to chance

Performance Metric	**T-Value**	**P-Value**
Mortality Rate	3.20	0.004
Readmission Rate	4.10	0.001
Patient Satisfaction	5.30	0.000
Medication Errors	6.50	0.000
Care Coordination	3.75	0.002
Infection Rate	2.90	0.007
Costs	4.55	0.000
Length of Stay	3.40	0.003
Waiting Times	3.80	0.002

Participants noted that through the use of IT systems, there was enhanced communication within and across departments among the physicians and nurses. Features such as access to up-to-date messages, files, or documents have improved the cooperation between various healthcare teams and, as a result, the management of patients and timely decision-making for the healthcare teams [12]. Based on the results of the qualitative analyses, IT systems have led to numerous positive changes in hospitals in terms of their performances, processes, and patients' experiences. The key themes of symptom relief, workflows, and changes in communication, quality, and patient involvement reflect the benefits offered by IT. The combined assessment supports the hypothesis of a positive relationship between IT use, hospital performance, and patient care outcomes. The study provides detailed recommendations on how to use IT in various hospital management areas, such as EHR, CDSS, and telemedicine, to support hospitals. Because of these mechanisms, hospital managers can capitalize on the knowledge they have about the IT solutions that they want to purchase and install. This research shows what stops organizations from using IT solutions, like user resistance and training issues. It also suggests ways to make the change to IT systems as smooth as possible by minimizing the problems that come with trying to make it work. The qualitative results of the study provide more detailed and richer perspectives on how IT is integrated in their organizations and how it impacts the decisions made in hospitals. These findings enhance existing knowledge in the healthcare IT domain due to the efforts to unravel factors that may either motivate or hinder the efficiency of IT in this field. This research can be of great use to hospital administrators and IT managers as it pinpoints some important factors that can help in improving the efficiency of the implementation of health IT and consequently improving the standards of care and delivery in hospitals [18]. This study serves to bridge a significant research gap and provide practical directions for leveraging IT to enhance healthcare management while enriching the theoretical body of knowledge on the subject.

Discussion

The derived 10% increase in patient satisfaction ratings suggests that applications of IT systems that promote increased patient centration, including patient portals, create patient-favorable experiences. These findings align with the improvements summarized in Table 3. If they can retrieve their patient information easier and if they can communicate with the caregiver more easily, patients will have higher levels of satisfaction as they receive care from the caregiver [15]. Applying the conflict-of-interest policy in pharmacy was effective in minimizing medication errors from 1.2% to 0.8%, proving that the regular use of CPOE systems decreases the number of prescription errors [3]. This only shows that there was a form of resistance to change, and this was more evident among older employees because of the cultural and behavioral changes that implement the use of IT [19]. The issue of patient privacy and conduct continues to dominate. It is crucial to note that various regulated information must be stored in hospitals, hence the need for proper compliance with the laws. This means an annual or monthly review of data and the use of proper data storage media [14]. policies that explain who can use the data and when, among others. Stakeholders such as healthcare providers, patients, and I/T staff are essential in the process of implementing IT systems. It is advisable for hospital administrators to create friendly platforms such as forums or committees where the relevant stakeholders can come in and give out their opinions, grievances, and even new ideas regarding the implementation of change management. This approach can minimize the risk of exposing different loopholes that may lead to a failure in

the system and help understand the need to come up with solutions that benefit everyone. Clinical and IT managers and hospital administrators should focus on long-term IT strategies for investments. This encompasses not only the one-off costs of adopting EHRs, CDSS, or CPOE but also potential recurrent costs associated with product maintenance, version upgrading, and technical support for staff. It is also important for these systems to have enough capital to be implemented and integrated in hospitals. The increased use of electronic tools involving patient engagement, for example, patient portals and secure messaging, has a great impact on patient satisfaction and patient care. Hospital administrators should prioritize the ease of use and accessibility of these tools to ensure their effective use. It is equally important to equip the patients with knowledge on how to go about using these tools, and this can be done through the helpdesk that most hospitals provide or through training.

The programs should include both theoretical components that explain the functioning of specific IT systems and practical elements that demonstrate their application in daily organizational activities [1]. Seminars and workshops regarding technological advancements and training on the job would also come in handy when staff seem to feel comfortable only with the set technologies [18]. Overlapping information technologies within care settings facilitate reduced workflows, such as integrated workflows, and can improve care interconnectivity [6, 17]. Implementation of new systems should not be done across the board; rather, hospitals should carry out trial runs with test data in order to detect any flaws. The slow rollout also involves the possibility of changing some of the features depending on the response of the first set of users, as well as reducing the possibility of interference with the normal running of hospitals. Systems should be tailored to suit the various requirements of a company, in that various sub-organizations and end-users will require diverse systems to suit their operations [20]. To achieve higher success with change management, organization and communication concerning the transition, especially through addressing worries and promoting the advantages of implementing IT systems, can also assist in the process [2]. Table 3 provides a side-by-side comparison of performance metrics before and after IT implementation, clearly illustrating the magnitude of change across all measured indicators. The overall sample size and generalizability of the sample can be considered major drawbacks of this study. In order to increase the use and usability of IT systems, they should be designed in a way that will utilize approaches towards the human component of technology. They are intended to be user-friendly, usable, and conform to the operational environment of the healthcare industry. It is possible to involve end-users in the development and refining processes to ensure that the latter meets their expectations. The implications of IT in the health field, particularly hospitals, must embrace strategic planning, training, secure data management, engaging stakeholders, and teamwork. With these recommendations and strategies met, hospital administrators and IT managers can fully leverage the IT system, thus enhancing patient care and operation efficiency. Although the study prioritized the use of stratified random sampling to gather a diverse and large cross-section of hospitals and stakeholders, the total number of hospitals and stakeholders may not be sufficiently comprehensive to account for variations across various regions, hospital sizes, and types. Problems associated with data consistency and completeness are inherent difficulties with the use of longitudinal data for evaluating the implementation of IT systems over time, as in the present study. New hospital CEOs, board membership changes, or other policy changes during the study period could potentially impact the results, while changes in healthcare regulations or technological

advancements during this period could also contribute to variability. The findings may be more relevant to other hospitals that are of comparable size, type, and locale to those of the study population, but the generalization across settings may not be very clear. Like any other study, future research can enhance its external validity by collecting data from larger and more diverse samples.

Table 3. provides a side-by-side comparison of performance metrics before and after IT implementation, clearly illustrating the magnitude of change across all measured indicators

Metric	Pre-IT Implementation	Post-IT Implementation	Change
Mortality Rates	2.5%	2.1%	-0.4%
Readmission Rates	15.0%	13.5%	-1.5%
Patient Satisfaction	72%	82%	+10%
Medication Errors	1.2%	0.8%	-0.4%
Length of Stay	5.6 DAYS	5.2 DAYS	-0.4 DAYS
Cost per Patient	$10,500	$9,800	-$700
Infection Rates	3.0%	2.5%	-0.5%

Conclusion

This research contributes enormously to the field of IT in hospital management by offering a rich set of empirical analyses of its effects on clinical and organizational performance. The study utilizes both quantitative and qualitative methods to reveal how applications like EHRs and CDS can thus result in reductions in mortality, readmissions, and improvements in patient satisfaction. The study therefore reveals that there is future research needed to ascertain the long-term benefits of such implementation strategies when faced with challenges such as initial adoption and that there is a need for frequent staff training, particularly in the new system, and strong leadership. One potential concern relates to the generalizability of the findings from the sample to a larger population of hospitals due to the size, nature, and technological heterogeneity of the sample. The findings may be more relevant to other hospitals that are of comparable size, type, and locale to those of the study population, but the generalization across settings may not be very clear. Like any other study, future research can enhance its external validity by collecting data from larger and more diverse samples. The study examines the impact of IT implementation at a specific point in time, ensuring that its efficacy does not require a longer duration to determine the positive outcomes of these systems. Some advantages or disadvantages associated with the implementation of IT that may exist can take years to surface, which is beyond the observation horizon of this study.

Research could also cover the economic consequences, given that studies of IT implementation in health care could explain the cost and revenue of its investments. Another area of research concern is integration, where questions that deal with the compatibility of various IT systems and the harmonization of data exchange formats are of importance [10]. This would greatly improve the probity and efficacy of IT in healthcare, as it would allow for the interoperability of different systems [16]. Future research should address the ethical issues related to IT in healthcare, especially in relation to patient confidentiality and information safety [13]. A review of sound strategies for conforming to ethical standards and the optimal utilization of IT could offer

valuable advice for policymakers and healthcare organizations.

Conflict of Interest

The authors declare that they have no conflict of interest. All authors have read and agreed to the published version of the manuscript.

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References

[1]. Argaw, S. T., Troncoso-Pastoriza, J. R., Lacey, D., Florin, M.-V., Calcavecchia, F., Anderson, D., Burleson, W., Vogel, J.-M., O'Leary, C., Eshaya-Chauvin, B., & Flahault, A., 2020. Cybersecurity of Hospitals: discussing the challenges and working towards mitigating the risks. *BMC Medical Informatics and Decision Making*, 20(1). https://doi.org/10.1186/s12911-020-01161-7

[2]. Chen, H., Li, L., & Chen, Y., 2020. Explore success factors that impact artificial intelligence adoption on telecom industry in China. *Journal of Management Analytics*, 8(1), 1–33. https://doi.org/10.1080/23270012.2020.1852895

[3]. Ratna Dewi, & Evita Isretno Israhadi, 2021. Legal Aspects of BPJS as National Health Insurance. https://doi.org/10.4108/eai.6-3-2021.2306412

[4]. Ulker-Demirel, E., & Ciftci, G., 2020. A systematic literature review of the theory of planned behavior in tourism, leisure and hospitality management research. *Journal of Hospitality and Tourism Management*, 43, 209–219. https://doi.org/10.1016/j.jhtm.2020.04.003

[5]. Umar, R. M., Apikoglu-Rabus, S., & Yumuk, P. F., 2020. Significance of a clinical pharmacist-led comprehensive medication management program for hospitalized oncology patients. *International Journal of Clinical Pharmacy*, 42(2), 652–661. https://doi.org/10.1007/s11096-020-00992-8

[6]. Uslu, B. Ç., Okay, E., & Dursun, E., 2020. Analysis of factors affecting IoT-based smart hospital design. *Journal of Cloud Computing*, 9(1). https://doi.org/10.1186/s13677-020-00215-5

[7]. Wu, J., Nadarajah, R., Nakao, Y. M., Nakao, K., Wilkinson, C., Cowan, J. C., A. John Camm, & Gale, C. P., 2023. Temporal trends of cause-specific mortality after diagnosis of atrial fibrillation. *European Heart Journal*. https://doi.org/10.1093/eurheartj/ehad571

[8]. Stoumpos, S., et al., 2023. Digital transformation in healthcare: leveraging EHR for patient-centered care. *Journal of Health Informatics*, 29(2), 123–135. Doi: 10.1016/j.jhi.2023.02.005.

[9]. Marques, G., & Ferreira, C. R., 2021. Telemedicine during COVID-19: Applications, challenges, and future directions. *Telehealth Journal*, 27(4), 245–259. Doi: 10.1016/j.tele.2021.06.011.

[10]. Miandoab, P., et al., 2023. Overcoming interoperability challenges in electronic health records systems. *Journal of Medical Informatics*, 35(1), 55–68. DOI: 10.1097/JMI.0000000000000623.

[11]. Nguyen, T., et al., 2023. Clinical Decision Support Systems for improving patient safety: A systematic review. *Clinical Decision Support Journal*, 14(3), 201–214. DOI: 10.1177/20552076231101972.

[12]. Kwon, H., et al., 2022. Smart hospital services and their impact on operational workflows. *Healthcare Management Review*, 47(1), 12–23. Doi: 10.1097/HMR.0000000000000309.

[13]. Yazici, A., 2020. RFID applications in hospital environments: Enhancing patient safety and efficiency. *Health Information Science Journal*, 16(2), 89–102. Doi: 10.1108/HISJ-08-2020-0045.

[14]. Mantas, J., et al., 2021. Informatics in healthcare: patient data management and continuity of care. *International Journal of Medical Informatics*, 151, 104467. Doi: 10.1016/j.ijmedinf.2021.104467.

[15]. Monteiro, A., et al.**,** 2023. The role of IoMT and wearable devices in real-time patient monitoring. *Healthcare Technology Journal*, 41(3), 321–338. Doi: 10.1080/17538157.2023.1810124.

[16]. Khanra, S., et al., 2020. Big data analytics in healthcare: A systematic literature review. *Health Policy and Technology*, 9(1), 16–27. Doi: 10.1016/j.hlpt.2020.09.003.

[17]. Haghi Kashani, M., et al., 2021. Internet of Things in healthcare applications: Opportunities and challenges. *Journal of Medical Systems*, 45(10), 112–125. Doi: 10.1007/s10916-021-01785-3.

[18]. Yaqoob, I., et al., 2021. Training and support for IT adoption in healthcare organizations. *Healthcare IT Management*, 18(2), 50–61. Doi: 10.1057/hit.2021.004.

[19]. Braithwaite, J., et al., 2020. Cultural resistance to health IT adoption: Insights and strategies. *Organizational Change in Healthcare Journal*, 14(2), 99–114. Doi: 10.1002/ochj.2020.002.

[20]. Selvaraj, S., & Sundaravaradhan, S., 2020. Challenges in IoT interoperability for healthcare. *Health Services Research Journal*, 55(3), 389–401. Doi: 10.1111/1475-6773.13382.

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Effects of Institutions on Entrepreneurship Development in Developing Economies

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Abstract

This study is galvanized by an accelerating disturbing debate in the circle of researchers relating to the effect of institutional influences on entrepreneurship development in the emerging economies. This study investigates the effect of combined formal and informal institutional factors on entrepreneurship development in developing economies. To accomplish the stated objectives, the empirical work of this study engaged secondary data-sets that covered 20 developing countries spanning between 1996-2022 and analyzed the data using the following estimation techniques: Panel Ordinary Least Square (POLS), Feasible Generalized Least Square (FGLS), Fixed Effect (FE), and Random Effect (RE) approach. The results of the study revealed that a unit increase in each employed institution has positive or negative effect on entrepreneurship development in emerging economies. The study recommends among other things that; deepening the developments of money deposit and micro-financial institutions to facilities credit to various individuals or organizations that embrace self-employment as well as the identification by the governments of the emerging economies of those economic factors that can make GDP growth to promote self-employment in their various countries. This study therefore concludes that institutional influences have varying positively and negatively impact on entrepreneurship development in emerging economies.

Keywords: *Developing Economies, Entrepreneurship Development, Institutional Theory, Institutional.*

Introduction

Entrepreneurship is an economic and existential factor, which when well combined with quality institutions drive's Gross Domestic Product (GDP) with commensurate impact on the country's economy. Entrepreneurship serves as a catalyst for economic development in developing countries by fostering innovation, creating employment opportunities, enhancing competitiveness, increased national income, and poverty reduction. It involves establishing new businesses, leading to more employment opportunities and improved financial stability for individuals [8, 20, 31].

However, the place of institutional frameworks cannot be relegated for the important support system it provided in promoting entrepreneurship, drive economic growth and shape the opportunities, incentives, and constraints entrepreneurs faces in developing economies. The entrepreneur activities are broadly influenced both by formal and informal institutions. Formal institutions are the noticeable ‘‘rule of the game’’, such as constitutional law and a national legal code [6, 23]. These rules can be shaped or tailored and modified instantly to match to varying economic circumstances. Contrarily, informal institutions are the unnoticeable rules of the game, comprised of norms, values, decent behaviours, and codes of conduct that describe a given context. Informal rules are usually not lawfully enacted and tend to take longer to amend. Informal and formal

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institutions often exist side by side. Through their combined actions, economic agents like entrepreneurs can bring about institutional change. *I*nstitution is recognized as the primary source of development and also as a factor that is responsible for the poor performance of developing countries because the institutional constraints in each country define a set of payoffs to political/economic activity that does not better-off productive activity. This have help to explained why entrepreneurship prevalence often do not translate into development in real institutional context [6, 28].

It is imperative to note that, though institutions are existent in all economies, there is still a great deal of diversity within them, and that one of such distinction between conventional and emerging economies can be portrayed in the context of institutional arrangements. So, if one is interesting in studying entrepreneurship within or across countries, the expansive nexus between entrepreneurship, economic development and institutions is an essential area of examination. This nexus is particularly important in assisting to comprehend why the relative additions of entrepreneurship can differ substantially across countries and regions. While, some researchers are concerned with how entrepreneurship development will thrive given the institutional context of a country, others also emphasized that what is completely absent in countries with dulled economic performance is not entrepreneurship as such but the correct institutional context for entrepreneurship to commence and to be socially advantageous [24]. He explains further that what is important for development are the rules that individuals comply with and how these rules are outlined or sketched and implemented. On a contrary, while many researchers believed that institutions in developing economies hold an important explanatory power to explain understanding of entrepreneurship, some felt that institutions in most developing economies are notoriously weak and so it is not likely that these institutions will hold an important explanatory power to allow comprehension of entrepreneurship in developing economies [13].

The objective of the study is to develop an understanding of institutional influences on entrepreneurship development and also to investigate relationship that exists between Institutions and Entrepreneurship Development in developing economies. This study will furnish entrepreneurs, international organizations and the policy-makers of countries with information on how entrepreneurial development institutions supports act as catalysts in the entrepreneurial ecosystem. Hence, this paper is organized as follows: the Literature Review accommodating the concept of entrepreneurship, institutional theory, Formal and Informal Institutions, including evidence from developing economies. The next sections addresses the Methodology, embraces Research design, Data collection strategy, model specification and Data analysis; Presentation of result; Discussion of Findings and Conclusion capped the discussion.

Literature Review

Conceptual Literature

Institutions are defined as the rules and norms that individuals follow in their daily lives, the formal and informal limitations and their enforcement features. Scott study's reviewed that, institutions are "social structures that have reached a high degree of resilience (and are) composed of cultural-cognitive, normative, and regulative elements that, together with combined activities and resources, provide stability and meaning to social life". In summary, the business and entrepreneurial activities are defined by the institutional structure established in a society. Further, definition of institution in context as social technologies consisting of rules-

routines, established norms, rules, constraints, and incentives that operate as mechanisms of governance for exchanges among individuals [28, 30].

This institutional framework figured-out the main principles which include the regulations, norms and restrictions both in formal and informal aspects with respect to political, legal and social matters. “Formal laws is defined as those regulations that are pronounced clearly in written terms” while “informal institutions described the non-explicit norms created in a country”. In other words, they are made up of values, patterns of behavior, traditions and beliefs that structure the culture of a particular context. The three different perspectives divisions of institutions recognized by the academics are: coercive, regulatory and cultural-cognitive [23, 32].

Entrepreneurship is defined as a process of identifying opportunities, facilitating innovation, and grabbing risk. An important aspect of entrepreneurship is that individuals establish new enterprises [22]. It is also the process of commencing a business; employing a manifest ability and eagerness of individuals, on their own, in teams, within and outside existing organizations, to perceive and establish new economic opportunities (new products, new production methods, new organizational schemes, and new product-market combinations) and to introduce their ideas in the market, in the face of uncertainty and other impediments, by making decisions on location, form, and the usage of resources and institutions [37]. It also means the activities of trying to obtain investment and production opportunity, establishing an enterprise to embrace a new production process, deepening capital, employing labour, organizing the supply of raw-materials, detecting site, launching a new method and commodities, finding out new sources of raw materials and choosing top managers of day to day affairs of the venture. Entrepreneurship is categorized into two types: opportunity- and necessity-driven entrepreneurship.

Opportunity-driven entrepreneurs comprise the participants in the risk-taking whose primary reason for commencing a business is to maximally accomplish a promising opportunity, hike their income, or accomplish personal goals while individuals who commenced a business as a result of a lack of alternative employment opportunities fall into this class of necessity-driven entrepreneurs.

Entrepreneurship Development is a dynamic process that is influenced by institutional conditions and the existing incentives structure [4]. it entails activities carried-out by institutional agencies of government and supporters of entrepreneurship to improve entrepreneurial skills and mindsets and advance skill acquisitions. Skill acquisitions can be attained through structural training, building entrepreneurial culture and attitude, and capacity-building programs [20].

Developing Economies illustrate countries with relatively low standard of living, under-developed industrial bases, and moderate to low Human Development Index (HDI). This index is comparative measure of poverty, literacy, education, life expectancy, and other factors for countries globally [37].

Institutional Theory

In low developing economies, institutions that influence entrepreneurship development are multifaceted. Therefore, an understanding of institutional theory can assist policy makers and entrepreneur to navigate the institutional landscape and devise meaningful strategies to promote entrepreneurial activities in developing economies.

Institutional theory propounded by Peter Berger, remains concerned with the rules of the game in a given environment like a business environment. The theory explains that all societies have classified laws and regulations (formal institutions) that define the

lawful rules of the game and also unclassified rules and regulations (informal institutions) which socially-shared conventional or unwritten, established, transmitted and administered outside of officially legitimated channels [23]. Further study emphasized on institutional theory applicable to entrepreneurship implies that entrepreneurs must comply to operation in institutions so as to gain approval and credibility and resources from essential correspondent onlookers and stakeholders of a specific society. Whereby, entrepreneurs resolute to assemble essential human and financial resources by persuading plausible resource components of the legitimacy, suitability and attraction of their intended activities relative to one or more socially established system of appraisal, [32]. Institutional theory framework thus suggests that the behavior of individuals, as well as organizations, are incorporated in and influenced by institutional arrangements [28]. The key assumption of this theory when employed to entrepreneurship may be that: environment-changing social forces fashion entrepreneurial achievement more than does economic efficiency, so, entrepreneurs should pursue to correspond their approaches with the norms, beliefs and regulations of their host societies' institutions or alter the rules of the game in their favour.

Formal and Informal Institutions in the Developing Economies

Formal Institutions

The formal institutions or environments in the context of developing economies are discussed below:

Institutional policy (Government Institutions): Better institutionalized public policy facilitates entrepreneurial development and activity while contrary is the opposite especially public policy related to entrepreneurship [39]. In emerging economies, the causes and implications of informality vary significantly [38]. The process of formalizing a business was greatly inefficient, tasking and time-consuming in developing economies. The importance of unofficial norms and networks is additionally raised by the combination of weak and incompetent national-level institutions [36]. Additionally, the association between corruption, in the form of bribery to government officials, and tax obedience is an essential but below-studied problem in many developing countries [27]. In an emerging economy, entrepreneurship is mainly looked into by governments as part of their trade and labour policies. In other words, governments find it confronting to establish particular entrepreneurial regulations that mainly give support to entrepreneurs. It is, hence, necessary to untie the burdensome restrictions that many governments impose to ease the process of commencing a firm and the trip for potential entrepreneurs. Further study emphasized that economic policies should encourage entrepreneurs to participate in general entrepreneurial activity that leads to economic growth in developing economies [17].

Access to capital (Financial Institution): In most emerging economies, entrepreneurs confront challenges in respect of access to finance or borrowing from financial institutions for business commencement [8]. Additionally, many of the entrepreneurs in the developing economies are less likely to gain access to and employ formal funding like bank loans, other credit facility options; and supplier credit, pointing to the fact that there may be limitations to access to credit. Consequently, most financial institutions demand some kinds of collateral, like a house, personal property, a piece of machinery or accounts receivable and trustworthiness [15]. In an evolving economy, when commencing a business, entrepreneurs are more likely to make use of their own and family savings instead of seeking for finances from banking organizations or other small financing organizations [29]. Entrepreneurial-based

financing organizations or micro-finance organizations that have emerged as an important policy tool for empowering entrepreneurs to pursue self-employment and reduce unemployment [33], as well as wider sustainable development have not met up to standard in these countries.

Education (Higher Education Institutions): Higher education institutions play an essential role in fostering entrepreneurship by providing the necessary resources, mentorship; and networking opportunities to convert creative ideas into profitable business ventures. Entrepreneurship education equip students with entrepreneurship shills, knowledge; and mindset improves their preparedness to move into the competitive job market . The positive impact of higher education students' entrepreneurship support has been confirmed by various scholars in their works [4, 35].

Government Expenditure: In recent time, the role of government in stimulating entrepreneurial activity has received global recognition because of the rising importance of entrepreneurship in economic growth. The main reason is that governments can transfer and redistribute resources among individuals with various levels of entrepreneurial productivity and mitigate the distortions in entrepreneurial resources.[39].

Informal Institutions

The informal institutions or environments in the context of developing economies are discussed below:

Cultural context: Cultural factors are comprehended to be the support of the household and close associates, institutional support (public or private), the consumption habits of the internal market, and the tradition of starting a business. In other words, it is the set of norms, values, and codes of conduct that advance social acceptance and approval of entrepreneurial activities, and that endure over time, the culture of a country or region directly influence the development of new ventures and the economic development [21]. Also, many researchers in their various scholarly works have pointed to the powerful influence that culture plays on the entrepreneurial activity in developing economies; most women entrepreneurs who reside in emerging economies have a higher extent of hardship or tough time as a direct result of the standards and cultural values that are prevailing in their societies [7]. Other numerous impediments develop as a result of culturally entrenched discriminatory socio-cultural norms and practices, which appeared in legislative and legal frameworks and institutional support systems in developing economies [15]. Although, some of the studies also reveal positive, negative or mixed effect on entrepreneurship development. [12].

Social Network: Resources sourced from social network can support entrepreneurs to triumph over difficulties, challenges; and even survival [12]. Social network also provides a convenient communication channel between entrepreneurial enterprises and external organizations for timely and valuable pieces of information [11, 19].

Evidence from Developing Countries

In the study on the impact of entrepreneurial ecosystem factors (institutional, organizational and individual levels) on women's ability and willingness to become entrepreneurs in Saudi Arabia using quantitative method to analyze secondary data from GEM. It suggested that broader institutional factors can impact women the more to becoming entrepreneurs in the country [2].

Further careful analysis of the effects of economic, social, and technological factors (institutional factors) on sustainable entrepreneurship over time in developing economies employing partial least squares structural equation modelling (PLS-SEM) to test three hypotheses. Finding indicated that all the three employed categories positively

impacted sustainable entrepreneurship over time but technological factor impact on sustainable entrepreneurship was less significant. It suggested that governments should focus on improving the aspects or variables related to social factor since it gave best result [8].

The use of analytical results based on 41,156 observations from 46 countries to examine formal and informal institutions as contingency variables on the relationship between entrepreneurial resources (institution) and entrepreneurial start-ups. Finding revealed that resource factors (human, financial, and social capitals) significantly affected entrepreneurial start-ups [23].

To further understand the institutional forces for promoting entrepreneurial development in higher learning institutions (HLIs) in Tanzania. The study was conducted using thematic analysis method to analyze both the primary and secondary data. Finding revealed that functional, active, mutually reinforcing and properly organized formal institutions enhanced entrepreneurship development in Tanzania. [25].

An investigative enquiry on the effect of the institutional environment (formal and informal institutional factors) that influences female entrepreneurs in an emerging country in Bangladesh using partial least squares-structural equation modelling. The study found that entrepreneurial attitudes, cultural context, institutional policy, family roles and education (all institutional contexts) were positive and significant on female entrepreneurship in Bangladesh. The study concluded that Bangladeshi government must aid women in starting their individual enterprises financially. The study suggested that Bangladeshi government and authorities take initiatives to decrease political and social issues that impede women's ability to make reasonable strategic choices [32].

Studies through research analyze the influences of formal and informal institutional factors on entrepreneurial activity among men and women in the context of Saudi Arabia using Mann-Whitney U test and a binomial logistic regression analysis on collected primary data. Findings revealed that while formal and informal institutional factors are reliable predictors of men entrepreneurship in Saudi Arabia, it was only informal institutional factors that are more reliable predictors of women's entrepreneurship behavior in the country. It suggested many checks for various institutions so as to hike entrepreneurship among each gender [1].

Researchers conduct a survey to investigate the determinants of informal entrepreneurship in Africa employing a cross-section of 21,954 firms from 47 African countries with many multivariate models to examine the factors that are related to the decision of firms to register at the commencement of their operations and the length of time to remain unregistered. Finding revealed that corruption, political instability, crime rate, infrastructure (electricity and transportation), access to land and finance, influence the entrepreneur's decision to register their firm at the start of its operation while the length of time firms remain unregistered revealed to be positively correlated to access to finance and infrastructural availability and negatively related to crime and political instability [13].

Organization of Economic, Cooperation and Development examined how higher education institutions are supporting innovation and entrepreneurship in the surrounding communities of eleven universities located in six countries in Latin America. Finding indicated that selected institutions were actively supporting entrepreneurs (universities students, but also local entrepreneurs) through courses, incubation and acceleration activities. It further showed that during COVID-19 pandemic, universities endured to stay afloat and keep a steady stream of support to entrepreneurs and partners [37].

Further conducted research to analyze the influence of institutional factors (political stability, government effectiveness, regulatory quality, a robust rule of law and others) on entrepreneurship development in 48 countries using qualitative comparative analysis to analyze sample data collected from GEM and the Global Innovation Index. The study found that the effect of institutional factors on the level of entrepreneurship differs according to the socioeconomic features of each country. It suggested that future research should examine how to standardized institutional configuration to move away from necessity to opportunity entrepreneurship [30].

Methodology

Research Design

This study will adopt *ex-post facto* research because data needed for analysis depends on secondary data preferred for the purpose of actualizing the research objectives. The study area covers the developing economies across the world. Organization of Economic, Cooperation and Development. To include Albania, Belarus, Ukraine, Egypt, Nigeria, Angola, Ethiopia, South Africa, Costa Rica, Cuba, Mexico, Jamaica, Argentina, Brazil, Venezuela, Iran, China, Indonesia, Papua New Guinea and Fiji.

Data Collection

The study was conducted based on secondary data source collection relevant to the research, providing insights into quality of institutional support, entrepreneurship, economic development and business ecosystems. The data for analysis is extracted from World Development Indicators database, Global Entrepreneurship Monitors Index database and others from the sampled countries for the period of 1996 - 2022. Consequently, it was ethically considered to safeguard the integrity and credibility of the study.

Data Analysis

Model Specifications

From the theoretical propositions of Institutional theory which was modified by a study carried out to investigation the roles of big businesses and institutions in entrepreneurship [33]. Thus, the original model as presented in equation (1.1)

$$Entrepreneurship_{it}=f(\text{key}_{it,}\ \text{Demand}_{it,}\ \text{Supply}_{it,}\varepsilon_{it}) \quad 1.1$$

where i denotes the country, t indicates the time, and $Entrepreneurship_{it}$ is a measure of entrepreneurial activity, Key_{it} is a vector of the variables of interest in country i at time t. Demand_{it} is a vector of demand-side determinants of entrepreneurship, i.e., GDP Per Capita, and FDI level in country i at time t. Supply_{it} is a vector of supply-side factors determining entrepreneurship, i.e., Pop-total and Edu-tertiary in country i at time t. Demand_{it} and Supply_{it} are the vectors of control variables, which are consistent with the efficient method and are assumed to increase the accuracy of the parameter estimates and decrease bias ε_{it} is the error term.

$$Entrepreneurship_{it} = (\text{Institutional variables}_{it} + \text{Demand side factors}_{it,} + \text{Supply side factors}_{it,} + \text{Control variables}_{it} + \varepsilon_{it}) \quad 1.2$$

$$Entrepreneurship_{it} = (\text{Entrepreneurial finance}_{it} + \text{Govt Policy}_{it} + \text{Govt Entre Programmes}_{it} + \text{Entre. Programme}_{it} + \text{GDP}_{it} + \text{FDI}_{it} + \text{Pop}_{it}it + \text{Entre. Eduaction}_{it} + \varepsilon_{it}) \quad 1.3$$

The above equation is subjected to modifications by including some intervening variables into this present study, equation (1.3) is hereby modified and specified accordingly in order to achieve the stated objective two of the study.

$$\text{Entre. Dev}_{it} = (\text{Entre. finance}_{it} + \text{Institutional Regulatory Quality}_{it} +$$

$\text{Govt. Expenditure}_{it} + \text{Education}_{it} + \text{Culture}_{it} + \text{Social Network}_{it} + \text{GDPPC}_{it} + \text{FDI}_{it} + \text{POP}_{it} + \varepsilon_{it}$ 1.4

Equation (1.3) had been modified to get equation (1.4). Entrepreneurship Development, Institutional Regulatory Quality, Govt. Expenditure and Social Network had been added to arrive at equation (1.4).

Econometrically,

$$ED_{it} = \beta_0 + \beta_1 EF_{it} + \beta_2 IRQ_{it} + \beta_3 GE_{it} + \beta_4 EDU_{it} + \beta_5 CUL_{it} + \beta_6 SN_{it} + \beta_7 GDPPC_{it} + \beta_8 FDI_{it} + \beta_9 POP_{it} + \varepsilon_{it} \quad 1.5$$

$$ED_{it} = \beta_0 + \beta_1 lnEF_{it} + \beta_2 IRQ_{it} + \beta_3 lnGE_{it} + \beta_4 lnEDU_{it} + \beta_5 CUL_{it} + \beta_6 SN_{it} + \beta_7 lnGDPPC_{it} + \beta_8 lnFDI_{it} + \beta_9 POP_{it} + \varepsilon_{it} \quad 1.6$$

$$Self - Emp_{it} = \beta_0 + \beta_1 lnEF_{it} + \beta_2 IRQ_{it} + \beta_3 lnGE_{it} + \beta_4 EDU_{it} + \beta_5 CUL_{it} + \beta_6 SN_{it} + \beta_7 lnGDPPC_{it} + \beta_8 lnFDI_{it} + \beta_9 POP_{it} + \varepsilon_{it} \quad 1.7$$

where

Self-Emp = Self-employed workers

lnEF = log of entrepreneurial finance

IRQ = Institutional Regulatory Quality

lnGE = log of Government Expenditure

EDU= Education

CUL = Culture proxied by Control of corruption

SN = Social Network

lnGDPPC = log of Gross Domestic Product Per Capita

lnFDI = log of foreign Direct Investment

POP = Population (% of total population ages 15+)

β_1 - β_9 = Parameters or slopes to be estimated.

β_0= Constant term for ED equation

i = denote number of countries (1-20)

t = denote number of time units (1-32)

ε = Stochastic disturbance term to capture omitted variables or error terms.

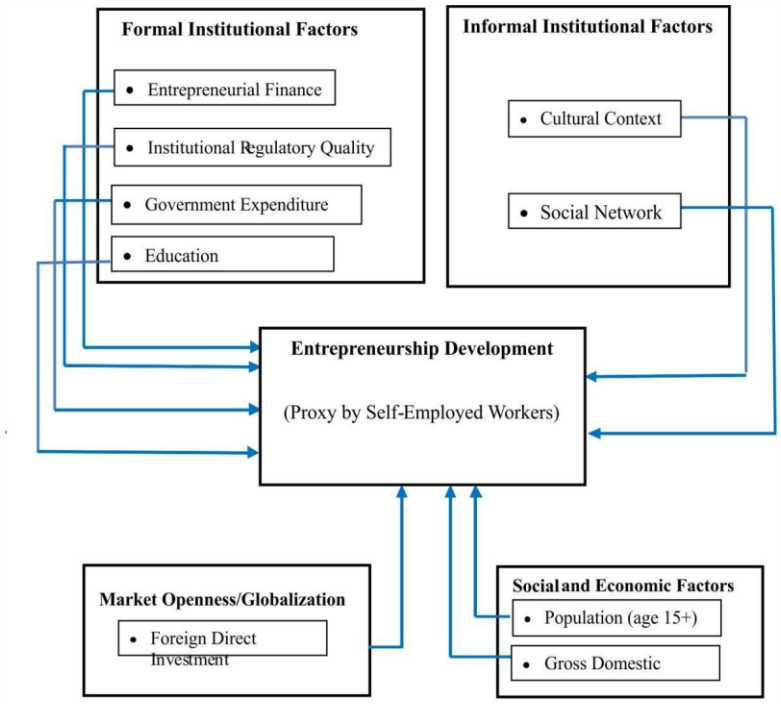

Figure 1. A Model of the Effects of Institutional Factors on the Entrepreneurial Development Proxy by Self-Employed Workers.

Source: Adapted from Y. Bakkar, S. Durst, & W. Gerstlberger, 2021, Journal of Risk and Financial Management 14: 174. https://doi.org/10.3390/jrfm14040174

A priori Expectation: All institutional variables are expected to be positively related to self-employed workers (entrepreneurship development). If all the formal and informal institutional variables increases so will also the self-employed workers (entrepreneurship development) and vice-versa.

Data Analysis Strategies

The various fundamental tests and estimation techniques employed are presented. To estimate equation (1.6) for the purpose of achieving the research objective, panel co-integration technique is adopted. It is an order of tests that are usually distributed and can take in unit specific drift and slope commonly and also cross-sectional dependence in addition. The proposition of panel co-integration estimation technique is splitted into three stages. The first stage addresses the testing of stationarity, i.e panel unit root test. The next stage addresses test for panel co-integration and the last stage handles the estimations of both the long-run and short-run equations (Panel Auto-Regressive Distributed Lag, PARDL). Panel data method which can cope with both sizeable cross-sectional dimension (large N) and time series dimension (large T) has the capacity of eliminating spurious regression. In furtherance to investigating the relationship between institutional factors and entrepreneurship development in developing countries using Panel Ordinary Least Square (POLS), Feasible Generalized Least Square (FGLS), Fixed Effect (FE), and Random Effect (RE) was utilized.

Empirical Results

This section presents the results of the conducted analyses to examine the objective of this study i.e to investigate the relationship that exists between each institution and entrepreneurship development in developing economies. Table 1.0 presents the estimated regression results of institutional factors on entrepreneurial development, measured by self-employment rates. The result shows that entrepreneurial finance has a significant positive impact on self-employment in the POLS (0.282, with $p < 0.01$) and the FGLS (0.217, with $p < 0.01$) models. However, the fixed and the random effect shows no significant effect. Similarly, institutional regulatory quality has a significant positive impact on self-employment in the POLS (11.09, with $p < 0.01$) and the FGLS (13.01, with $p < 0.01$) models; however, the estimates from the fixed and the random effect show insignificant positive coefficients. There is a mixed result regarding the impact of government expenditure on self-employment. The POLS and the FGLS showed significant negative coefficients (-0.298 and -0.270) whereas the fixed and the random effects have significant positive coefficients (0.042 and 0.038). The impact of education on self-employment is consistently positive and significant in all the models; POLS, 0.108; FGLS, 0.205; FE, 0.110; RE, 0.116.

However, the impact of culture on self-employment is consistently negative and significant in all the models; POLS, -25.31; FGLS, -26.26; FE, -4.471; RE, -5.217. Similarly, the impact of social networks on self-employment is consistently negative and significant in some of the models; POLS, 0.058 with $p < 0.05$; FE, -0.047 with $p < 0.01$; RE, -0.046 with $p < 0.01$. There is no statistical evidence for the impact of GDP growth impact on self-employment in the context of this study. Moreover, the impact of FDI on self-employment is consistently positive and significant in all the models; POLS, 0.449; FGLS, 0.535; FE, 0.095; RE, 0.096. Contrarily, the impact of above age 15 population on self-employment is consistently negative and significant in all the models; POLS, -2.7; FGLS, -2.67; FE, -0.233; RE, -0.305. The coefficient of adjustment shows that about 31.6%-98.9% of the variation in self-employment is explained by the institutional variables and the control variables. The significance of the computed F-stat signifies that all the variables are jointly significant in explaining self-employment across

the models. The standard error or regressor suggests that the FGLS model fits the data better due to the smaller standard error of the regression.

Table 1. Regression Estimates of the Institutional Influences on Entrepreneurial Development

Independent Variables (IV):	**DV: Self-Employment**			
	POLS	**FGLS**	**F-E**	**R-E**
Entrepreneurial Finance	0.282***	0.217***	-0.013	-0.009
	(0.037)	(0.029)	(0.017)	(0.018)
Institutional Regulatory Quality	11.09***	13.01***	0.512	0.742
	(1.797)	(1.393)	(0.557)	(0.588)
Government Expenditure (%GDP)	-0.298***	-0.270***	0.042**	0.038**
	(0.088)	(0.065)	(0.017)	(0.018)
Basic Education	0.108***	0.205***	0.110***	0.116***
	(0.108)	(0.029)	(0.018)	(0.020)
Culture	-25.31***	-26.26***	-4.471***	-5.217***
	(1.759)	(1.362)	(0.786)	(0.833)
Social Network	-0.058**	-0.005	-0.047***	-0.046***
	(0.025)	(0.017)	(0.008)	(0.009)
GDP growth	0.003	0.051	-0.032	-0.029
	(0.114)	(0.076)	(0.025)	(0.026)
FDI (% GDP)	0.449***	0.535***	0.095**	0.096**
	(0.144)	(0.127)	(0.039)	(0.041)
Population 15+ (% Total)	-2.700***	-2.670***	-0.233***	-0.305***
	(0.131)	(0.106)	(0.055)	(0.060)
Constant	201.0***	193.0***	51.31***	55.22***
	(9.101)	(7.370)	(3.459)	(4.574)
Adj. R2	0.740	0.854	0.989	0.316
F-Stat.	163.3***	332.8***	1685.0***	27.26***
SE	12.37	0.976	2.561	2.696
Breusch-Godfrey LM Test	3923.9***			
Redundant Fixed-Effect Test			1634.1***	

*Note: * p< 10%, ** p < 5%, *** p < 1%*

Source: Author's computation, 2025.

Discussion of Findings

This section presents the discussion of the findings of the empirical analyses carried out based on the objectives of the study.

Firstly, the result shows that entrepreneurial finance has a positive and significant effect in the POLS (0.282, $p < 0.01$) and FGLS (0.217, $p < 0.01$) models, indicating that access to credit fosters self-employment in developing countries. This is evident in countries such as Kenya and Nigeria, where the expansion of microfinance institutions and commercial bank loans has allowed small businesses to grow, particularly in the informal sector. The rise of Equity Bank in Kenya and Bank of Industry in Nigeria has contributed significantly to entrepreneurial activity by providing credit facilities tailored to micro, small, and medium enterprises (MSMEs) [29]. However, in fixed effects (-0.013, $p > 0.1$) and random effects (-

0.009, $p > 0.1$) models, the relationship becomes insignificant, indicating that within-country variations over time may not necessarily translate to higher self-employment, possibly due to regulatory constraints or misallocation of funds.

Also, it can be observed in the result that regulatory quality exhibits a strong positive impact in POLS (11.09, $p < 0.01$) and FGLS (13.01, $p < 0.01$), implying that better governance and efficient regulatory frameworks enhance self-employment. Countries like Rwanda and Mauritius, which have improved their Ease of Doing Business rankings by simplifying business registration, reducing corruption, and streamlining tax policies, have seen a surge in entrepreneurship. Rwanda, for instance, reduced the time required to register a business from 24 days in 2005 to less than 6 hours today, leading to higher self-employment rates [9]. However, in fixed effects (0.512, $p > 0.1$) and random effects (0.742, $p > 0.1$) models, the effect is insignificant, suggesting that short-term regulatory changes may not immediately affect self-employment, as entrepreneurs require time to respond to policy shifts. This result aligns with the institutional theory which propounds that strong institutions reduce uncertainty and transaction costs, thereby encouraging self-employment [28].

On the impact of government expenditure, there are mixed results. For instance, government expenditure has a negative effect in POLS (-0.298, $p < 0.01$) and FGLS (-0.270, $p < 0.01$) models, indicating that higher public spending may discourage self-employment. This is seen in South Africa and Brazil, where extensive social welfare programs and government employment opportunities reduce the incentive for individuals to pursue self-employment [35, 38]. In contrast, in fixed effects (0.042, $p < 0.05$) and random effects (0.038, $p < 0.05$) models, the relationship turns positive, suggesting that long-term government investments in infrastructure and education may eventually create a more conducive environment for self-employment. This result is more reasonable due to the heterogeneity adjustments in the fixed and random effect models.

Furthermore, it can be observed in the results that basic education has a consistent positive effect across all models (POLS: 0.108, $p < 0.01$; FGLS: 0.205, $p < 0.01$; Fixed Effects: 0.110, $p < 0.01$; Random Effects: 0.116, $p < 0.01$). This result is consistent with countries like Ghana and Vietnam, where educational reforms have focused on vocational and entrepreneurial training, and have experienced rising self-employment rates. Also, Ghana's National Entrepreneurship and Innovation Programme (NEIP) has capitalized on education to foster start-ups and small businesses. Theoretically, this result aligns with the human capital theory which argues that education enhances problem-solving skills and business acumen, making individuals more likely to engage in self-employment.

Moving on, the result shows that the culture variable has strong negative coefficients in all models (POLS: -25.31, $p < 0.01$; FGLS: -26.26, $p < 0.01$; Fixed Effects: -4.471, $p < 0.01$; Random Effects: -5.217, $p < 0.01$), which suggests that corruption discourages self-employment. In countries like Nigeria and Bangladesh, high levels of corruption force entrepreneurs to pay bribes, leading to increased operational costs and discouraging business formation [14, 26, 34]. This result does not stand alone but has theoretical justification in the institutional anomie theory which states that corruption weakens formal business structures, pushing individuals into informal self-employment.

Moreover, the regression results indicate that social network consistently has a negative effect on self-employment across multiple models. The POLS estimate shows a negative and significant coefficient (-0.058, $p < 0.05$), while the Fixed Effects (-0.047, $p < 0.01$) and Random Effects (-0.046, $p < 0.01$) models confirm the negative relationship. However, the FGLS estimate (-0.005, $p > 0.1$) suggests an

insignificant relationship, implying that in some cases, increased internet penetration does not strongly affect self-employment at a broader scale. In countries like India and South Africa, the rapid expansion of the Internet has led to a greater preference for formal employment opportunities, as digital connectivity allows individuals to access remote jobs, digital platforms, and multinational employment rather than engage in self-employment [9, 31]. Many young people in India, for example, are opting for gig economy jobs on platforms such as Upwork, Fiverr, and Amazon Mechanical Turk rather than starting their businesses. Similarly, in South Africa, the increasing use of digital banking and e-commerce has made formal employment in tech-based firms more attractive than informal self-employment. As internet penetration increases, many businesses become digitized, reducing the necessity for informal self-employment in traditional sectors.

However, unlike other variables, GDP growth does not show a significant effect on self-employment. The regression estimates for GDP growth are statistically insignificant across all models (POLS: 0.003, $p > 0.1$; FGLS: 0.051, $p > 0.1$; Fixed Effects: -0.032, $p > 0.1$; Random Effects: -0.029, $p > 0.1$). This suggests that fluctuations in economic growth do not directly translate into changes in self-employment levels. This outcome is consistent with real-world observations in developing economies such as Nigeria, where periods of high GDP growth have not necessarily resulted in higher self-employment rates. For example, Nigeria experienced an average GDP growth rate of 6% from 2000 to 2015, but this period saw an increasing shift towards formal employment rather than self-employment. Similarly, Brazil's economic expansion from 2002 to 2013 led to more wage employment opportunities, reducing the need for individuals to rely on self-employment as a primary source of income. The structural change theory explains this phenomenon by arguing that as economies grow, labour moves from traditional self-employment in agriculture and informal businesses to more structured wage employment in industries and services. Moreover, the opportunity-pull and necessity-push theory suggests that in times of economic growth, individuals are "pulled" into higher-paying jobs, while in economic downturns, they may be "pushed" into self-employment out of necessity [37].

It can be inferred from the result that FDI has a positive and significant impact in all models (POLS: 0.449, $p < 0.01$; FGLS: 0.535, $p < 0.01$; Fixed Effects: 0.095, $p < 0.05$; Random Effects: 0.096, $p < 0.05$). In Vietnam and Malaysia, increased FDI has contributed to self-employment by creating supply chain opportunities for local entrepreneurs [3, 10].

Lastly, the result shows that the proportion of the population aged 15+ has a strong negative effect on self-employment (POLS: -2.700, $p < 0.01$; FGLS: -2.670, $p < 0.01$; Fixed Effects: -0.233, $p < 0.01$; Random Effects: -0.305, $p < 0.01$). In countries like India and Egypt, where rapid population growth has led to formal job creation, self-employment rates have declined [18]. This aligns with the Lewis model of development, which states that as economies grow, labour shifts from informal self-employment to structured wage employment.

Summary and Conclusion

The results of Panel Ordinary Least Square (POLS), Feasible Generalized Least Square (FGLS), Fixed Effect (FE), and Random Effect (RE) estimation techniques revealed various results ranging from positive, mixed and negative relationships between each institution and entrepreneurship development; and while some results showed statistical significance, others showed statistical insignificance. This shows that these findings are in line with the findings of some earlier researchers who the above results are in tandem with theirs. It is recommended that Governments of developing economies should further deepen the developments of money-deposit and micro-

financial institutions that can provide credit facilities to various individuals or organizations and as well invest enormously in human capital like education, health and infrastructural facilities as investments in these critical areas can catapult entrepreneurship development to the next level in developing economies. According to the findings of this study, future research can focus on Government Policies and Assessing the extent of shocks transmission from institutional changes to entrepreneurship development in developing economies.

Conflict of Interest

The authours declare no known conflicts of interest regarding the manuscript.

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References

[1]. Abdullah, A., Tojo, T., & David, U., 2024, Female entrepreneurship in the start-up ecosystem of Saudi Arabia, *Journal of Enterprising Communities*: People and Places in the Global Economy, 18(5).

[2]. Abdullah, A., Tojo, T., & David, U., 2022, The influence of institutions on early-stage entrepreneurial activity: a comparison between men and women in Saudi Arabia, *Journal of Entrepreneurship in Emerging Economies*, 15(5).

[3]. Abidin, N. Z., Saraih, U. N., & Rashid, I. M. A., 2022, The effect of foreign direct investment on wage in Malaysian manufacturing sector: New Evidence Using ARDL. Management & Accounting Review, 21(2) *Journal of Entrepreneurship in Emerging Economies*, 15(5).

[4]. Amao-Taiwo, B., Shittu, A., & Yinusa, O., 2023, Higher education student entrepreneurship support services: Implications for the development of entrepreneurial skills, *Covenant Journal of Entrepreneurship*, 7(1), 42-51.

[5]. Bernatzki, T., Busse, M., & Hoekstra, R., 2022, Promoting Rwanda's business environment: Impact of reforms and drivers of change. *Development Policy Review*, *40*(2), 578.

[6]. Bakkar, Y., Durst, S., & Gerstlberger, W., 2021, The impact of institutional dimensions on entrepreneurial intentions of students—International evidence, *Journal of Risk and Financial Management* 14: 174. https://doi.org/10.3390/jrfm14040174

[7]. Bullough, A., Guelich, U., Manolova, T. S., & Schjoedt, L., 2022, "Women's entrepreneurship and culture: gender role expectations and identities, societal culture, and the entrepreneurial environment", *Small Business Economics*, 58(2), 985-996.

[8]. Chaves, V. J. C., Ribes, G. G., & Moya, C. I., 2024, Effect of the economic, social and technological factors on sustainable entrepreneurship over time, *Journal of Business Research*, 173, 114457.

[9]. Choi, J., Dutz, M. A., & Usman, Z., 2020, The future of work in Africa: Harnessing the potential of digital technologies for all. *World Bank Publications.*

[10]. Dao, T. B. T., Khuc, V. Q., Dong, M. C., & Cao, T. L., 2023, How does foreign direct investment drive employment growth in Vietnam's formal economy? Economies, 11(11), 266. https://doi.org/10.3390/economies11110266

[11]. Dianez-Gonzalez, J. P., Camelo-Ordaz, C., 2019, The influence of the structure of social networks on academic spin-offs' entrepreneurial orientation, *Industrial Marketing Management*, 80, 84-98.

[12]. Drummond, C., McGrath, H., O'Toole, T., 2018, The impact of social media on resource mobilization in entrepreneurial firms, *Industrial Marketing Management*, 70, 68-89.

[13]. Ejiogu, A., Okechukwu, O., Ejiogu, C., Owusu, A., & Adeola, O., 2022, 'Determinants of informal entrepreneurship in Africa', *International Journal of Entrepreneurship and Small Business* 45(1), 35-61. https://doi.org/10.1504/IJESB.2022.120552

[14]. Ejiogu, A., Ejiogu, C., & Ambituuni, A., 2018, "The dark side of transparency: Does the Nigeria

extractive industries transparency initiative help or hinder accountability and corruption control?" *The British Accounting-review*, available at: https://doi.org/10.1016/j.bar.2018.10.00

[15]. Franzke, S., Wu, J., Froese, F. J., & Chan, Z.X., 2022, "Female entrepreneurship in Asia: a critical review and future directions", *Asian Business and Management*, 21(3), 343-372.

[16]. Gloria, L. O. M., Juan, C. R. A., & Katherine, Y. L. M., 2022, Culture as an obstacle for entrepreneurship, *Journal of Innovation and Entrepreneurship,* 11:46.

[17]. Hechevarría, D., Bullough, A., Brush, C., & Edelman, L., 2019, "High-growth women's entrepreneurship: fueling social and economic development", *Journal of Small Business Management*, 57(1), 5-13.

[18]. Horne, R., 2024, Employment and social trends by region. *World Employment and Social Outlook*, 2024(1), 37-60

[19]. Huatao, P., Bingbing, L., & Yang, L., 2022, How social network influences the growth of entrepreneurial enterprises: Perspective on organizational and personal network, *SAGE Journals.*

[20]. Inegbedion D. O., & Oghojafor B. E. A., 2021, Entrepreneurship education and elimination of unemployment among graduates and non-graduates of tertiary institutions in Nigeria. *Journal of Women Empowerment and Studies*, 01(02), 6-16

[21]. Kara, A., & Dheer, R. J., 2023, The relationship between culture and entrepreneurship: the role of trust, *International Entrepreneurship Management Journal*, 19, 1803-1833.

[22]. Kusa, R., Duda, J., & Suder, M., 2021, Explaining SME performance with fsQCA: The role of entrepreneurial orientation, entrepreneur motivation, and opportunity perception. *Journal of Innovation & Knowledge*, 6(4), 234–245. https://doi.org/10.1016/j.jik.2021.06.001

[23]. Li, T., 2024, The joint effects of formal and informal institutions on entrepreneurial startups: a global perspective, *International Studies of Management & Organization,* 54(4).

[24]. Miyajima, M. K., 2023, The Link between Social Grant and Employment in South Africa. *International Monetary Fund. Selected issues papers* 2023(039). http://doi.org/10.5089/979400243493.018

[25]. Mollel, E. S., Chachage, B., & Pasape, L., 2024, A framework for enhancing entrepreneurship development in higher learning institutions (HLIs) in Tanzania, *International Journal for Multidisciplinary Research*, 6(3), E-ISSN: 2582-2160.

[26]. Mojishola, E., 2024, Effect of Corruption on Entrepreneurial Development in Nigeria. *Journal of Policy and Development Studies*, *17*(2), 79-91.

[27]. Mozumdar, L., Materia, V.C., Hagelaar, G., Islam, M. A., Velde, G.V.D., & Omta, S.W.F., 2022, "Contextuality of entrepreneurial orientation and business performance: the case of women entrepreneurs in Bangladesh", *Journal of Entrepreneurship and Innovation in Emerging Economies*, 8(1), 94-120.

[28]. North, D. C., 1990, Institutions, institutional change and economic performance. Cambridge. *Cambridge University Press.*

[29]. Ogunsanwo, O. F., & Olowo, S. O., 2020, Role of Bank of Industry on small scale entrepreneurial development in Nigeria. *American International Journal of Business Management*, *3*(3), 19-24.

[30]. Pau, S. P., Irene, C., & Alicia, M. T., 2022, Institutional factors affecting entrepreneurship: A QCA analysis, *European Research on Management and Business Economics.*

[31]. Sindakis, S., & Showkat, G., 2024, The digital revolution in India: bridging the gap in rural technology adoption. *Journal of Innovation and Entrepreneurship*, 13(1), 29.

[32]. Sobhan, N., & Hassan, A., 2023, The effect of institutional environment on entrepreneurship in emerging economies: female entrepreneurs in Bangladesh, *Journal of Entrepreneurship in Emerging Economies*, Emerald Publishing Limited 2053-4604. https://doi.org/10.1108/JEEE-01--0028

[33]. Shanji, X., & Taeyoung, P., 2023, The roles of big businesses and institutions in entrepreneurship: A cross-country panel, *Journal of Innovation & Knowledge*, 9.

[34]. Spyromitros, E., & Panagiotidis, M., 2022, The impact of corruption on economic growth in developing countries and a comparative analysis of

corruption measurement indicators. *Cogent Economics & Finance*, 10(1), 2129368.

[35]. Wanli, D., & Juan, W., 2023, The effect of entrepreneurship education on the entrepreneurial intention of different college students: Gender, household registration, school type, and poverty status, *PLoS ONE* 18(7): e0288825.

[36]. Welter, F., 2020, "Contexts and gender–looking back and thinking forward", International *Journal of Gender and Entrepreneurship*, 12(1), 27-38.

[37]. World Bank, 2020, Doing business: Institutional quality and economic performance in Africa. Washington, DC: *World Bank*.

[38]. Williams, C. C., Adom, K., & Horodnic, I. A., 2020, "Determinants of the level of informalization of enterprises: Some evidence from Accra, Ghana", *Journal of Developmental Entrepreneurship*, 25(1), 2050004.

[39]. Yoon, H., Kim, N., Buisson, B., & Phillips, F., 2018, "A cross-national study of knowledge, government intervention, and innovative nascent entrepreneurship", *Journal of Business Research* 84: 243-252.

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Pedagogy in a Pandemic: A Case Study of Blended Learning Challenges at a Technical University in Botswana

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Abstract

This paper explores the challenges encountered by students and teaching staff members during the implementation of blended learning at the Botswana International University of Science and Technology (BIUST) amid the Covid-19 pandemic. A mixed-methods research approach was adopted, guided by a descriptive case study design. The population of the study were BIUST staff and students. A total of 73 students and 53 teaching staff members were purposively selected to participate in the study. The research employed Diffusion of Innovation (DoI) theory and Social Constructivist theory. Structured surveys, semi-structured interviews, open-ended questionnaires, and document analysis were used to collect data. The use of triangulation methods strengthened the reliability and validity of the research findings. The findings indicated that participants faced numerous challenges, such as unreliable internet connections, increased workload for teaching staff members, a lack of digital literacy skills among students and teaching staff members, students' low engagement in the virtual learning environment, and inadequate training programs on blended learning. The participants recognised blended learning's value, but multiple obstacles made it difficult to implement it effectively during the pandemic. The study concluded that BIUST needed to develop stronger preparedness through investing in technological infrastructure, inclusive planning, and ongoing professional development on the application of digital tools for students and staff members.

Keywords: *Blended Learning, Challenges, COVID-19 Pandemic, Digital Tools, Higher Education.*

Introduction

This paper examines the challenges both academic staff and students encountered during Covid – 19 at BIUST. This is part of a larger study that investigated the implementation of blended learning at BIUST. Hence, the focus of this paper is only on the challenges encountered during the pandemic. The Covid-19 pandemic necessitated a rapid shift in educational delivery models globally. In Botswana, higher education institutions, including the Botswana International University of Science and Technology (BIUST), adopted blended learning as a response strategy during the outbreak of the Covid-19 pandemic. The introduction of blended learning at BIUST has not received a systematic, comprehensive, in-depth evaluation since its implementation. The absence of a thorough evaluation regarding the challenges presented by blended learning creates a major knowledge gap about how BIUST handled the transition to blended learning and its educational results.

Most higher education institutions adopted blended learning as their pedagogical model since the outbreak of the Covid-19 pandemic [1, 2]. The sudden closure of educational institutions during the Covid-19 pandemic forced universities to rapidly adopt blended learning as an emergency response for

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maintaining academic operations during the pandemic [3, 4]. The implementation of blended learning in poor and developing countries faces various barriers because of inadequate infrastructure, poor teaching methods, and insufficient digital skills [5, 6].

Research studies in Africa have shown that digital disparities, together with teacher training deficits and inadequate internet infrastructure, hinder the successful implementation of blended learning [7-9].

The majority of existing literature on blended learning focuses more on investigating general e-learning systems and institutional readiness, with minimal attention given to crisis-driven blended learning implementation from the perspective of both students and teaching staff [10-12]. There is a lack of sufficient data about the challenges of blended learning implementation in Botswana, particularly at BIUST, and this created an information gap about this particular context.

During the Covid-19 pandemic, the Botswana International University of Science and Technology (BIUST) adopted blended learning as a strategic response to continue offering education during a time of government-imposed lockdowns and health restrictions. Therefore, it was essential to find out whether the implementation of Blended learning at BIUST during the Covid-19 pandemic was smooth or not. This study explored what both teaching staff members and students at BIUST experienced during the Covid-19 pandemic. There was no documentation to that effect on such experiences, hence the necessity of this study.

Since the outbreak of the Covid-19 pandemic, most universities have been under pressure to embrace digital transformation[13]. This approach has been adopted by universities due to a major shift in adopting new pedagogical strategies to strengthen and promote mechanisms for digital universities, and the promotion of the democratisation of knowledge [13, 14]. Despite the adoption of these strategic initiatives, most universities in Sub-Saharan Africa continue to experience challenges with the blended learning implementation strategies [15].

Research highlights the importance of analysing the implementation of blended learning through a combination of theoretical frameworks such as the Unified Theory of Acceptance and Use of Technology (UTAUT), Technology Acceptance Model (TAM), Task Technology Fit (TTF), Diffusion of Innovation Theory and Theory of Planned Behaviour (TPB) [16, 17]. These are used to analyse technological adoption by examining the perspectives and viewpoints of key stakeholders. For instance, the UTAUT serves as a model that is used to evaluate user technology adoption behaviours across different contexts by integrating various theoretical components.

In this regard, evaluating the challenges faced by students and teaching staff at BIUST becomes crucial when studying the implementation of blended learning during the Covid-19 pandemic, which underscores the need for this study. Such an evaluation highlights valuable lessons that will help develop better teaching and learning approaches and policies to manage future crises, thus validating the value of this study.

Research Objectives

The key research objectives of the study were to: a) examine the challenges experienced by students and teaching staff members during the implementation of blended learning at BIUST during the Covid-19 pandemic, and b) establish how the challenges encountered by students and staff members at BIUST can be overcome.

Theoretical Framework

The Diffusion of Innovation and Social Constructivist theories were adopted as Theoretical guidelines for this study.

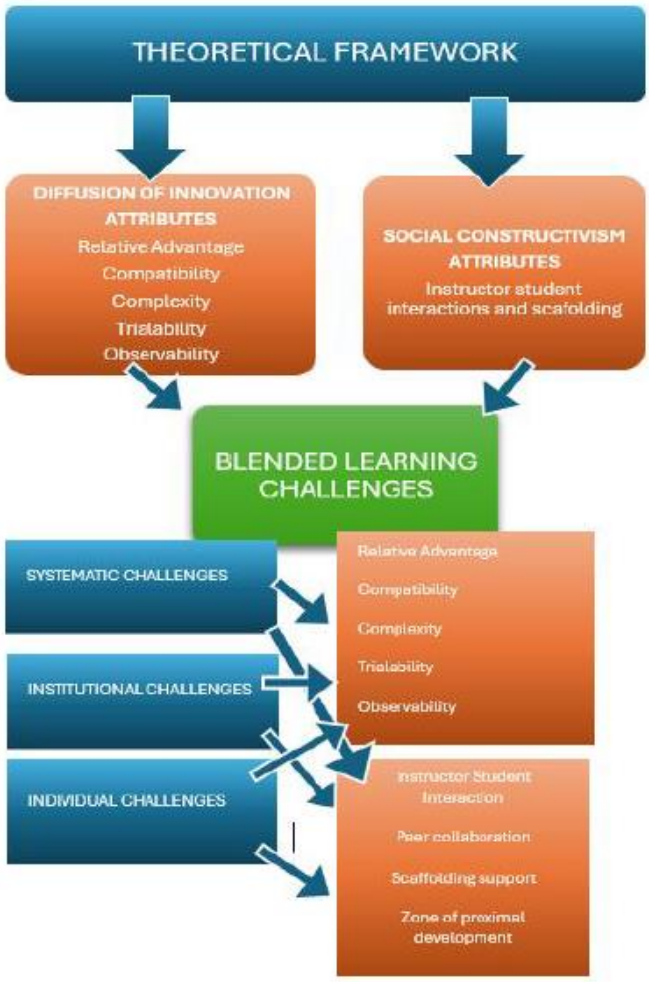

Figure 1. Theoretical framework showing the combination of diffusion of innovation theory and social constructivism

Figure 1 shows how the two theories, Diffusion of Innovation and Social Constructivist theories, together were used to identify the challenges faced by students and teaching staff members during the implementation of blended learning at BIUST during the Covid-19 pandemic. According to Rogers' Diffusion of Innovation theory, innovation adoption occurs based on perceived attributes, which include relative advantage, compatibility, complexity, trialability, and observability. In the context of blended learning, the relative advantage of blended learning depends on how students and staff perceive its effectiveness compared to traditional face-to-face teaching methods. The compatibility factor examines how well blended learning integrates with current teaching methods and institutional rules, and student learning patterns. The perceived difficulty of using digital platforms and tools represents complexity, which acts as a barrier to adoption when users find them too complicated. In addition, the ability to test blended learning through small-scale trials before full implementation helps stakeholders understand its value through trialability. The visibility of positive outcomes, such as improved engagement or flexibility, represents observability, which helps increase acceptance among stakeholders [18, 19]. In this study, these attributes have been used to identify the challenges encountered by students and teaching staff members at BIUST during the implementation of blended learning during the Covid-19 pandemic.

In addition, the Social Constructivist theory suggests that learning occurs in social environments that necessitate instructor-student interactions and scaffolding for active engagement [20]. In the context of this study, the blended learning environment at BIUST requires instructor-student collaboration, peer learning, and guided support to achieve meaningful engagement and knowledge construction. In addition, the digital scaffold helps students advance through their Zone of Proximal Development.

These theoretical models provide a strong framework for understanding the various challenges that blended learning presents in limited-resource learning environments.

This study is part of a larger study that highlighted that during the Covid-19 pandemic, BIUST launched multiple initiatives to support the implementation of blended learning at the institution. It is important to understand the challenges faced by students and teaching staff members at BIUST, and the measures to satisfy immediate stakeholder requirements. While the university implemented multiple strategies to maintain blended learning, there are no studies that focus on the challenges faced by students and teaching staff members during the implementation of blended learning at BIUST during the Covid-19 pandemic.

The study will guide future initiatives toward better inclusion and sustainability, and alignment with student and staff requirements to support the institution's digital transformation and educational excellence goals.

Methodology

Study Design

The study adopted a mixed-methods approach, incorporating both qualitative and quantitative data. A descriptive case study design was employed to provide an in-depth understanding of the institutional context and the experiences of stakeholders.

Study Site

The study was carried out at the Botswana International University of Science and Technology (BIUST). The university is situated approximately 270 kilometres from Gaborone in the Central District of Botswana. It was established by an Act of Parliament in 2009. BIUST continued to play a pivotal role in supporting Botswana's strategic shift from a resource-based to a knowledge-based economy. Originally founded with two main faculties—Engineering and Science—the institution transformed in 2024, restructuring into schools, including the School of Business and Professional Development. BIUST is a specialised institution focused on Science, Engineering, and Technology education, with a clear mandate to drive innovation, research, and human capital development in critical areas of national development.

During the Covid-19 pandemic, BIUST, like many other institutions globally, was compelled to adapt rapidly to ensure the continuity of teaching and learning. Faced with lockdowns and health restrictions, the university transitioned from traditional face-to-face instruction to a blended learning model that combined online platforms. Guided by its 2017 Teaching and Learning Policy, the university implemented several strategic interventions, including providing tablets to staff, installing classroom cameras, and delivering targeted training in digital pedagogy. While these efforts reflect BIUST's commitment to academic continuity and pedagogical innovation, the impact of such initiatives, especially on staff and student experiences, remains an area requiring deeper exploration; hence, this study critically assessed the challenges experienced during the implementation of blended learning at BIUST during the Covid-19 crisis.

Participants

The participants comprised 53 teaching staff members (lecturers, instructors, lab

technicians, and teaching assistants) and 73 students from various academic disciplines at BIUST.

Sampling

The research employed purposive sampling to choose participants from various schools within BIUST. The researchers applied this method to achieve balanced representation among different academic fields. In addition, purposive sampling was used to select participants who had experience with blended learning implementation at BIUST during the Covid-19 pandemic. The participants were selected purposively because they could provide detailed insights about blended learning at BIUST during the Covid-19 period. The research involved 73 students, together with 53 teaching staff members at BIUST.

Data Collection

Data were collected using the following tools:

1. Structured surveys with Likert-scale questions
2. Semi-structured interviews
3. Open-ended questionnaires
4. Document analysis of institutional reports and training materials

Various data collection tools were used to gather data. The research used open-ended questionnaires and online surveys to gather data from students and teaching staff members. The researcher used a five-point Likert scale to measure the challenges faced by students and teaching staff members during the implementation of blended learning at BIUST during the pandemic. The tools were used to collect qualitative data about student and teaching staff perspectives regarding the challenges they faced in the implementation of blended learning at BIUST during the pandemic.

Data Analysis

The researcher performed quantitative data analysis using SPSS software, while multiple researchers and statistical experts reviewed the qualitative coding for consistency. The research design provided a solid framework that allowed researchers to create a comprehensive report about the challenges presented by the implementation of blended learning at BIUST during the Covid-19 pandemic.

Quantitative data were analysed using descriptive statistics, while qualitative data were coded and thematically analysed. Data triangulation across instruments enhanced the reliability and depth of the analysis. The open-ended questionnaire responses underwent thematic analysis to extract qualitative data. The thematic analysis method enabled researchers to capture important personal teaching and learning experiences and their perceptions of teaching staff members and students regarding the implementation of blended learning at BIUST during the Covid-19 pandemic. The survey responses underwent both descriptive and inferential statistical analysis for quantitative data assessment. The reliability of the data online survey questionnaire was assessed using Cronbach's Alpha, which is a measure of internal consistency that is used to ensure that the survey items reliably assess the intended constructs.

The research provided a comprehensive understanding of the challenges of the implementation of blended learning experienced by students and teaching staff members at BIUST during the Covid-19 pandemic.

Validity

The gathered data showed important patterns and trends regarding the challenges faced by the participants during the implementation of blended learning at BIUST. Thematic analysis was used to identify recurring patterns and vital findings from student and teaching staff member responses. The data collection tools validated that participant responses were both reliable and valid.

Reliability

The study results showed consistency between the open-ended questionnaires and semi-structured interviews, and online survey data. The data collection tools were distributed at various points in time to different groups of participants. The participants were revisited multiple times through open-ended questionnaires and interviews to assess participants and obtain detailed information about BIUST blended learning implementation. The participants' responses demonstrated consistency, which proved both reliable and credible. This cuts across the teaching staff members and students.

Ethical Considerations

All participants received complete information about the study before the researcher obtained their consent through signed forms from those who chose to participate. The research team protected participant identities through anonymisation while ensuring complete confidentiality. The researchers stored the data on a computer system that required a secure password for access. The researchers maintained exclusive access to all information collected from respondents.

Results of the Study

Participants Demographic Information

Students Demographic Information

Table 1. Students' Demographic Information by Schools within the University

School	Frequency (=n)	Percentage (%)
School of Electric and Mechanical Engineering	29	39.7
School of Pure and Applied Science	13	17.8
School of Life Sciences	11	15.1
School of Earth Sciences and Engineering	19	26.0
Post graduate School	1	1.4
Total	73	100

Figure 2 shows the demographic distribution of students who participated in the study across different schools at BIUST. It reveals a diverse representation of the Schools and BIUST. The total number of respondents is 73. The School of Electric and Mechanical Engineering has the highest number of representatives, with 39.7% of participants. The School of Earth Sciences and Engineering is the second-highest represented School. It accounts for 26.0% of the respondents. The School of Pure and Applied Science and the School of Life Sciences have a representation of 17.8% and 15.1%, respectively. Notably, the Postgraduate School has the least representation, with a representation of only 1.4% of the total participants. The Postgraduate School had just been newly established as an independent school from the other schools during the time of data collection. Therefore, some of the students who could have selected the post-graduate school selected other schools that they belonged to, as they had not yet been officially transferred to the Post-graduate school.

Teaching Staff Members' Demographic Information

Table 2. Teaching staff members' Demographic information

Position	Frequency(=n)	Percentage(%)
Lecturer	21	39.6
Teaching Instructor	12	22.6
Laboratory Technician	9	17.0
Teacher Assistant	11	20.8
Total	53	100

Table 2 presents the distribution of teaching staff members who participated in the study by their position. The survey results indicate that a total of 53 participants took part in the study. Lecturers comprise the largest group of respondents, accounting for 21 (39.6%) of the total number of respondents. Teaching instructors made up twelve 12 responses (22.6%) while laboratory technicians had the lowest representation with nine 9 responses (16.9%), and teaching assistants made up 11 responses (20.7%).

Challenges Faced by Participants during the Implementation of Blended Learning at BIUST During the Covid-19 Pandemic

The implementation of blended learning at BIUST was not without its difficulties. Teaching staff members and students reported a range of difficulties; some shared commonalities, while others were unique to their roles. The results presented below combine both quantitative data and supporting qualitative responses to provide a comprehensive understanding of the nature and extent of the challenges experienced by both teaching staff members and students during the Covid-19 pandemic at BIUST.

Challenges Faced by Teaching Staff Members

Teaching staff members reported that the shift to blended learning presented some problems for them.

Figure 2 indicates that most teaching staff members, n = 42 (79.2%), experienced significant challenges during the Covid-19 pandemic. In contrast, the remaining participants, n = 11 (20.8%), did not experience major challenges. This suggests that most participants faced significant challenges, which likely hindered their ability to deliver effective instruction during the implementation phase.

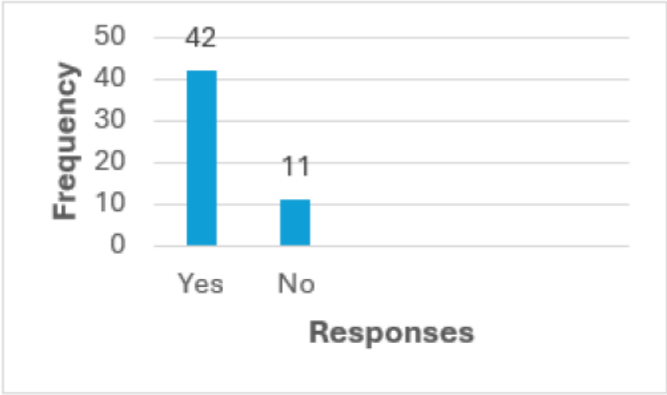

Figure 2. Teaching Staff Members' Responses to the Statement: Did you encounter any significant challenges with blended learning during the COVID-19 pandemic?

The high number of affirmative responses indicates that BIUST lacked sufficient preparation to implement blended learning effectively for teaching needs during the pandemic.

Technical Challenges

When specifically asked whether teaching staff members experienced some technical issues, such as internet connectivity problems and software-related problems, while implementing blended learning at BIUST during the Covid-19 pandemic, the responses presented in Figure 4 confirm that technical challenges were among the most prominent barriers encountered by the teaching staff members.

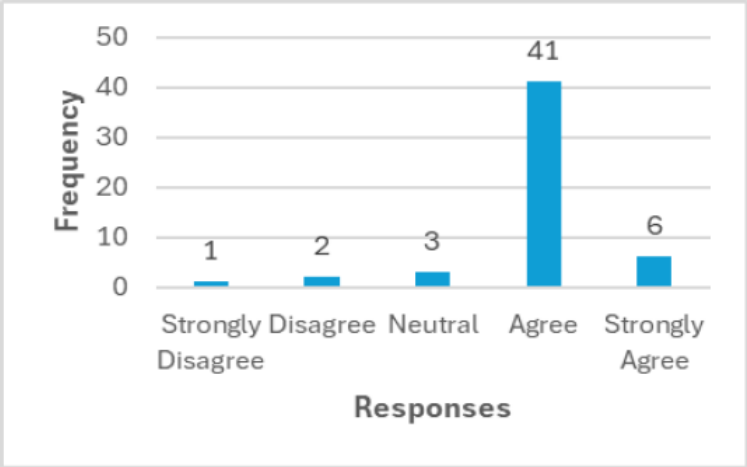

Figure 3. Teaching Staff Members' Responses to the Statement: I experienced technical issues (e.g., internet connectivity, software problems) while implementing blended learning.

Figure 3 above shows that a total of n = 41 (77.4%) teaching staff members agreed that they experienced technical issues, and 11.3% of participants (n = 6) strongly agreed with the statement. The results show that technical problems occurred frequently during the implementation of blended learning at BIUST during the Covid-19 pandemic. Only a small number of participants, n = 2 (3.8%), disagreed with the statement, and n = 1 (1.9%) strongly disagreed. The minority of the responses indicate that most teaching staff members encountered technical problems.

The quantitative results were further confirmed by the qualitative data, in which participants expressed frustrations over persistent connectivity problems.

One lecturer (TS-L2) reported:

"Internet connectivity is a real issue. Sometimes, I lose connection in the middle of a lecture, and it's frustrating. It disrupts the flow, and students lose interest."

A Teaching instructor (TS-TI 3) shared a similar concern:

"Live classes were constantly interrupted. Video freezes, audio disappears—students can't follow, and we end up having to start over or record sessions separately."

A laboratory technician (TS-LT 1) added a similar perspective:

"Sometimes the internet fails, and I have to cancel and reschedule. That throws everything off. It disrupts the momentum."

These verbatim illustrate the extent to which technical issues undermined the teaching process during the implementation of blended learning at BIUST. The results also indicate that connectivity issues disrupted learning continuity, frustrated teaching staff members, and also undermined the quality and continuity of learning at BIUST. The available technological infrastructure could not always support consistent teaching and learning, particularly during synchronous delivery.

Instructional Overload in a Blended Learning Context

Teaching staff members were asked whether the transition to blended learning led to an increase in their workload. The responses reflected a divided perception among participants.

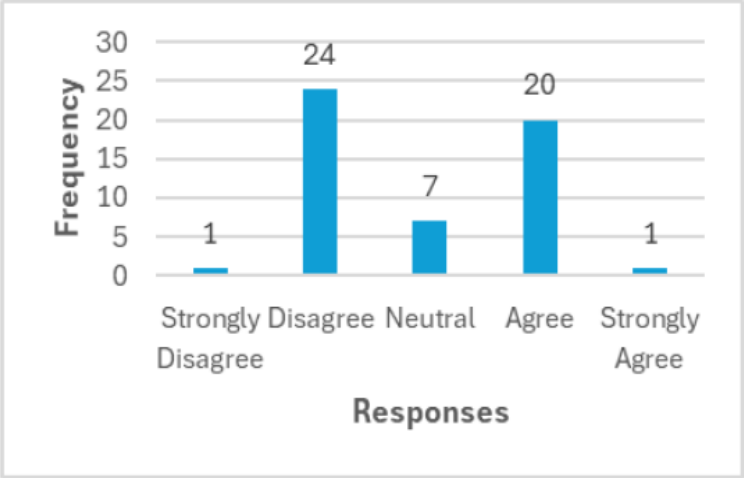

Figure 4. Teaching Staff Members' Responses to the Statement: The workload increased due to the transition to blended learning**.**

The results presented in Figure 4 show that n = 21 (37.7%) teaching staff members either agreed or strongly agreed that their workload increased due to the transition to blended learning at BIUST during the Covid-19 pandemic. In contrast, n = 24 (45.3%) disagreed. The survey results showed that n = 9 (17.0%) participants chose to remain neutral in their responses. The teaching staff members indicated that staff members who faced workload increases were responsible for creating educational materials for both classroom and online delivery. Those who perceived an increase in workload attributed it to the need to prepare instructional content in both face-to-face and online formats.

This is consistent with qualitative results. A laboratory technician (TS-LT 3) shared:

"Blended learning takes more time than traditional methods. Preparing for blended sessions takes hours. I record extra content, respond to more emails, and deal with technical issues, all of which extend my working hours."

Similarly, a lecturer (TS-L4) highlighted the need to constantly adapt materials:

"There's always something to revise or reformat. A PowerPoint for in-class use doesn't always translate well online. You have to rework your material constantly."

What emerges from these responses is more than just a mere expression of dissatisfaction. The remarks reflect the compounded demands introduced by the implementation of blended learning at BIUST during the Covid-19 pandemic. It shows that the shift to blended learning required teaching staff members to juggle dual modes of delivery. The increase in teaching staff workload indicates the necessity for workload management strategies and institutional support to maintain the successful implementation of blended learning.

Challenges with Student Adaptation and Engagement in Blended Learning

The teaching staff members identified maintenance of student engagement as another significant problem in online learning environments. The survey results showed that educators widely agreed that students struggled to adapt to the blended learning approach at BIUST during the implementation of the system.

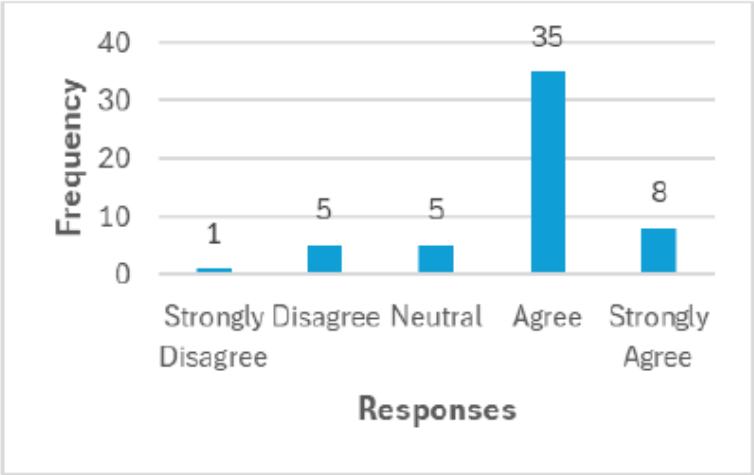

Figure 5: Teaching Staff Members' Responses to the Statement: Students faced difficulties in adapting to blended learning methods.

As illustrated in Figure 5, the results show that a significant majority of teaching staff members, n = 43 (81.1%), either agreed or strongly agreed that students struggled to adapt to the blended learning approach. It is important to note that this may reflect some deeper underlying issues. This overwhelming affirmation suggests a deeper issue that extends beyond surface-level resistance to change. The teaching staff members identified some of the factors that contributed to the adaptation challenges: students' unfamiliarity with online learning environments, unstable internet connectivity, limited access to digital devices and unfamiliarity with learning management systems.

These limitations not only hindered students' ability to participate fully but also compromised the teaching staff's capacity to effectively deliver content and monitor progress. The quantitative data is supported by qualitative evidence gathered from participants.

A lecturer (TS-L5) recounted:

"Some students didn't attend classes regularly due to poor internet connection. When they did attend, they hardly participated. It felt like I was talking to myself."

Another lecturer (TS-L6) described the loss of real-time engagement:

"In a physical class, I can tell when someone is lost or disengaged. When they attend online classes, they turn off their cameras and stay silent. It's impossible to tell who's with you and who's not."

These verbatim reflections highlight the difficulty teaching staff faced in maintaining meaningful interaction with students in an online setting. The digital learning environment made it difficult for educators to monitor student engagement because traditional classroom body language and dynamics were absent. The digital environment made it difficult for educators to determine student understanding while they struggled to offer immediate assistance and promote active student participation.

Inadequate and Generalised Training for Teaching Staff

Teaching staff members expressed doubts about the adequacy and usefulness of the training they received to help them transition to blended learning. The participants acknowledged that BIUST provided training sessions about Blackboard platform usage, but several participants stated that the training sessions lacked sufficient depth and duration to meet their instructional requirements. A lecturer (TS-L2) reported that:

"The training was helpful, but it was short and generic. I never got to explore all the features of Blackboard."

Similarly, a teaching instructor (TS-TI 4) expressed:

"I struggled to integrate external tools into Blackboard, and more hands-on sessions would have helped. We needed more training, not just a quick overview."

These verbatim highlights that while initial training was appreciated, it was insufficient for many teaching staff members, particularly those who wanted to use advanced features on blended learning tools and applications. to the need for ongoing, differentiated professional development at BIUST. The results show that a standardised, one-size-fits-all approach was not adequate for equipping all teaching staff with the competencies required to navigate blended learning effectively.

Challenges Faced by Students

The data collected from student responses reveals that students experienced several notable challenges in the implementation of blended learning at BIUST during the Covid-19 pandemic.

Balancing Blended Learning with Other Responsibilities

Students were asked whether they found it challenging to balance blended learning with other personal, academic, or social responsibilities. While the shift to blended learning introduced new opportunities for flexible engagement, for many students, it presented practical challenges that affected students' learning experience.

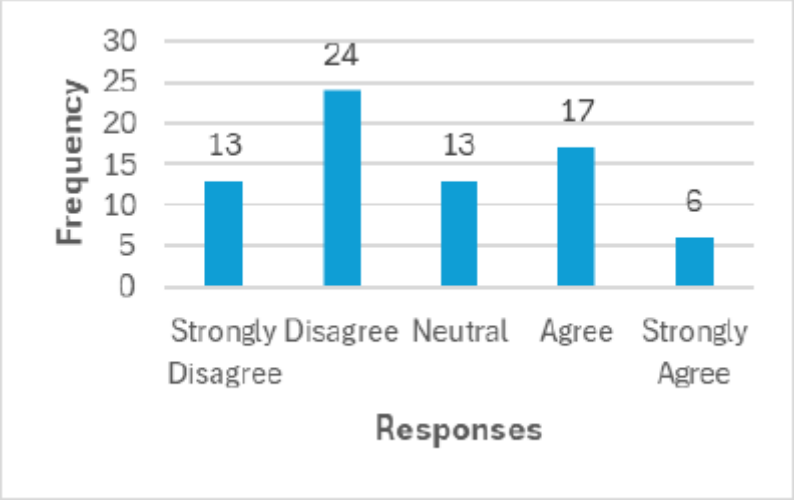

Figure 6. Students' Responses to the Statement: "I found it challenging to balance blended learning with other responsibilities**."**

Figure 6 shows that students who disagreed with the statement outnumbered those who strongly disagreed with n = 24 (32.9%) and n = 13 (17.8%), respectively. The total number of participants who did not find balancing blended learning with other responsibilities difficult was n = 37 (50.7%). The survey results show that n = 17 (23.3%) of participants agreed and n = 6 (8.2%) strongly agreed that they experienced challenges in managing and balancing blended learning and responsibilities. The remaining n = 13 (17.8%) participants chose a neutral stance, which may indicate they had mixed feelings or were uncertain about their experiences.

The study reveals a multifaceted situation because numerous students appreciated blended learning flexibility yet numerous others struggled with maintaining structure and balance. Students needed to take full responsibility for their time management because blended learning eliminated both fixed schedules and structured learning environments. Students who depended on traditional classroom structures for their academic habits found it especially difficult to

adapt to the absence of external scheduling systems. The quantitative findings were supported by qualitative feedback.

A student (ST7) reported:

"The freedom to choose when to engage with the material sometimes leads to poor time management."

Another student (ST8) echoed this challenge:

"I find it hard to keep up with the workload. I miss the structured environment of traditional classrooms, where there's a clear routine."

These verbatim show how autonomy, while empowering, can become a barrier when not supported by appropriate scaffolding. For students who are accustomed to traditional, routine-driven instruction and externally imposed schedules, the shift to a more flexible model required a level of self-discipline that some struggled to maintain.

The results indicate that BIUST should establish support systems that include time management training and scheduled teaching and learning plans to assist students in effectively handling the requirements of the blended approach.

Accessing and Navigating Blended Learning Resources

Students were asked about their challenges in obtaining essential resources, including textbooks and online materials, which are needed for successful blended learning participation. The responses revealed a wide range of experiences, with no dominant consensus across the group.

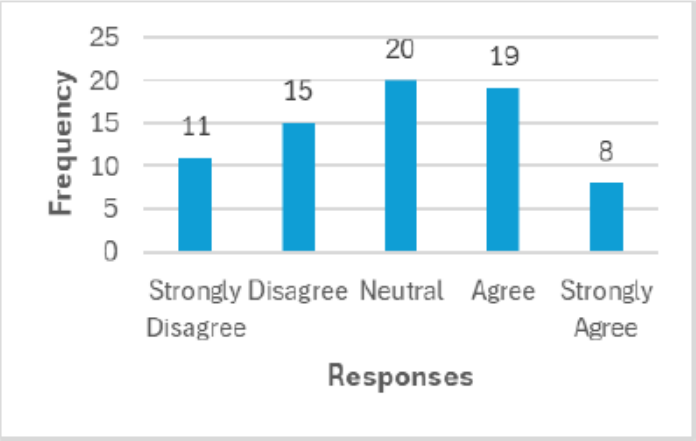

Figure 7. Students' Responses to the Statement: "I experienced difficulty accessing necessary resources (e.g., textbooks, online materials) for blended learning."

Figure 7 shows that n = 19 (25.0%) of students agreed, and n = 8 (10.5%) strongly agreed that they had difficulty accessing necessary resources. This amounts to a total of n = 27 (35.5%) students who acknowledged facing some degree of difficulty in accessing the necessary resources for the successful implementation of blended learning at BIUST during the Covid-19 pandemic. In contrast, the figure shows that n = 15 (19.7%) of students disagreed with the statement that they had trouble accessing necessary resources. An additional n = 11 (14.5%) strongly disagreed with the statement. A total of n = 26 (34.2%) students did not perceive access to BL resources as a significant challenge.

The mixed opinions about blended learning demonstrate a complex reality. Although many students valued the flexibility offered by blended learning, a substantial number found it challenging to. Students who needed required materials for participation managed to obtain and use them without major difficulties, but others encountered barriers that prevented them from fully participating. The challenge extended beyond students' ability to access physical materials. Students demonstrated poor information literacy skills and struggled to

navigate online content ethically, according to qualitative feedback.

A student (ST 9) reported:

"I often find conflicting information, and it's tough to know what to trust. Understanding the ethical use of information, especially in the context of AI, is something I think we are missing in our training."

Similarly, another student (ST 10) highlighted the need for greater support in evaluating digital sources:

"We need more guidance on how to select credible sources on the internet, specifically the ethical use of AI."

These reflections bring to light a critical dimension of resource access which extends beyond the availability of students to critically engage with, evaluate, and ethically use digital content within blended learning settings. The results indicate that certain students did not receive sufficient training in digital literacy, particularly in understanding credibility, relevance, and ethical standards in the context of AI-generated information.

Therefore, the challenge of accessing resources in blended learning requires evaluation beyond infrastructure and distribution systems. It must also include institutional support. The gap needs to be addressed to enable students to achieve full benefits from blended learning environments, particularly during disruptions like the Covid-19 pandemic.

Technical difficulties during the implementation of blended learning at BIUST

The students were asked if they encountered any technical problems, such as internet connectivity issues or software problems, while participating in blended learning at BIUST. The responses indicated that technical challenges were another major barrier for the majority of students.

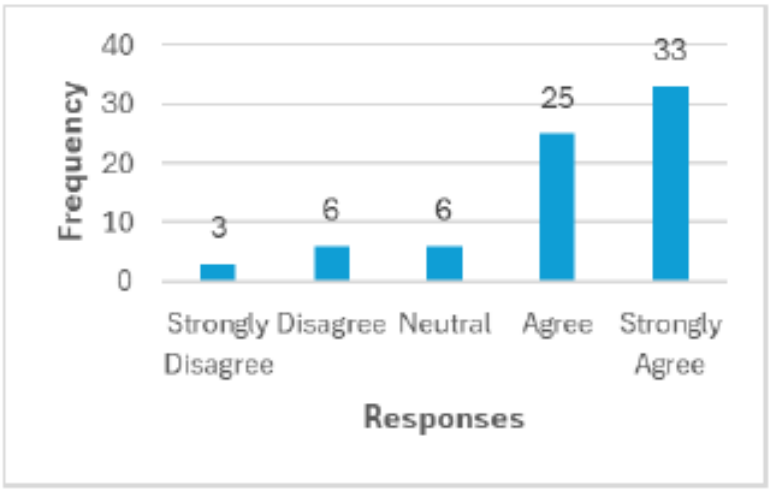

Figure 8. Students' Responses to the Statement: "I faced technical difficulties (e.g., internet connectivity, software issues) while participating in blended learning."

Figure 8 shows that 33 participants (45.2%) strongly agreed that they experienced some challenges with technical issues regarding the implementation of blended learning, and 25 participants (34.2%) also agreed with the statement. In addition, the survey results showed that n = 6 (8.2%) of the respondents disagreed with the statement, and n = 3 (4.1%) strongly disagreed. The remaining n = 6 (8.2%) participants expressed no opinion about the statement.

The survey results indicate that most BIUST students did not have access to technical resources. The results reveal possible institutional shortcomings in providing adequate support for students to fully participate in digital aspects of blended learning. The majority of students reported

difficulties with digital learning because they lacked access to digital tools or online experience, but a few students did not encounter these problems. The quantitative data aligns with qualitative feedback from students.

A student (ST 11) reported:

"Some of us are not familiar with some online learning tools. It would be so helpful if there were workshops or tutorials that show us step-by-step how to use these platforms correctly."

Another student (ST 12) elaborated on the difficulty of navigating digital platforms:

"Navigating platforms like Blackboard can be challenging. While I can get the basics done, I don't feel confident using advanced tools on Blackboard... we are learning as we go, which slows down the whole process."

These reflections illustrate that technical difficulties extended beyond connectivity or hardware issues. The lack of structured guidance about digital platform usage was also a part of this problem. There is a need for continuous support, together with specialised training in digital literacy. This can help students learn advanced features so that they can be able to effectively use learning management systems such as Blackboard.

In conclusion, the implementation of blended learning at BIUST presented some challenges for teaching staff members and students, yet their challenges showed distinct patterns. The shared technological and digital literacy problems indicate common system-wide obstacles, but the workload perceptions and engagement levels, and resource access differences show how role-based expectations influenced individual experiences about the implementation of blended learning at BIUST during the Covid-19 pandemic. This shows that there is a need for an improved, inclusive method of planning and support. The implementation of structured training programs, better infrastructure, and enhanced student support systems will create an equitable and effective blended learning experience for all stakeholders at BIUST.

Discussion of Findings

The findings of the study revealed that there were several challenges that students and teaching staff members experienced during the implementation of blended learning at BIUST during the Covid-19 pandemic.

The findings indicate that most teaching staff at BIUST faced major obstacles during blended learning implementation during the peak of the Covid-19 pandemic. The data shows that most teaching staff members faced technical problems along with increased workloads, low student participation, and inadequate training. The identified challenges indicated that the educational system lacked both the necessary infrastructure and readiness to support blended learning environments.

In addition, the findings showed that 79.2% of teaching staff members experienced major challenges during the implementation phase. Many participants encountered technical problems that included internet connection problems and software system issues. These findings reflect the findings of other studies where similar challenges related to the implementation of blended learning were reported. For example, studies have shown that many educational institutions in developing countries did not possess the technological infrastructure needed to deliver successful online learning [3, 7]. Furthermore, [6] a similar conclusion was reached in a study that discovered that technical problems disrupted the delivery of blended learning during the pandemic.

Most participants stated that internet instability caused both lesson interruptions and reduced student interest. Participants such as TS-L2 and TS-TI3 expressed frustration about the frequent loss of internet connectivity and the freezing of video feeds, and delayed communication. The study shows that unstable internet connections blocked learning

opportunities, which resulted in poor instructional quality. This is consistent with findings of [5, 9]found similar results in their research, which showed that virtual classroom disruptions caused students to lose interest in learning.

Furthermore, the findings revealed that teaching staff members experienced higher workloads because they needed to handle both physical classroom teaching and online instruction. The survey results showed that 37.7% of participants believed their workload intensified during the transition to blended learning. The staff members needed to develop content for both online and in-person platforms while modifying materials and offering additional support to students. This is consistent with the findings of [4, 11], who discovered that educators in blended learning environments often experience an increase in their workload and time management challenges, especially when schools make sudden pedagogical changes.

Nevertheless, the findings of the study also highlighted that a portion of the teaching staff showed disagreement with the statement that *the workload increased due to the transition to blended learning* through their responses. This could stem from variations between departments and course structures, and personal preferences for individual teaching approaches among teaching staff members at BIUST. The laboratory technician (TS-LT3) explained that the requirement to transform materials for dual instruction methods extended the workday duration. Likewise, a lecturer (TS-L4) acknowledged that the process of converting classroom PowerPoints into online content proved challenging. These findings reveal that blended learning requires different levels of demands across various roles and academic disciplines.

The study findings also demonstrated that teaching staff members struggled to keep students actively engaged. The findings revealed that 81.1% of students had challenges adapting to the blended learning approach during its implementation at BIUST during the pandemic. The findings match findings from prior studies, which identified reduced student participation and the absence of real-time cues as major challenges in online education [8, 12]. The current study corroborates this through TS-L5 and TS-L6, who observed that visual engagement disappeared, and students failed to respond during classes, making it difficult to monitor student attentiveness.

The virtual classes at BIUST lacked the feedback cues that students would normally receive from facial expressions and body language, which are present in classroom environments. The study indicates that the absence of visual and verbal interaction made it challenging for teaching staff to detect students who were struggling or to provide immediate pedagogical support. This indicates the requirement for interactive and inclusive virtual classroom designs.

Another important finding is that a significant number of teaching staff members felt the training provided to them for blended learning implementation was insufficient. While BIUST provided training on the Blackboard platform, some staff members noted that the Blackboard platform training at BIUST was too short and did not provide enough practical experience. These observations are supported by the findings of [10,13], who found that short and generic training programs did not prepare teachers adequately for online teaching. The participants in this study believed that the training sessions did not teach them advanced functions or external tool integration, which would have improved teaching quality.

The results indicate that future training initiatives should implement differentiated strategies based on staff needs and experience levels to ensure successful blended learning implementation. Furthermore, the institutional approach should focus on providing continuous

support through follow-up workshops and peer-assisted learning models.

This study also identified student-related challenges. A significant number of students encountered some challenges when trying to manage their blended learning responsibilities with their personal life, academic, and social responsibilities. The survey results showed that while 50.7% of students disagreed with the statement, *I found it challenging to balance blended learning with other responsibilities,* and 31.5% admitted that they faced difficulties in handling multiple roles. The research results match the findings of a study by [2, 14], which show that flexible learning models without structured routines create academic discipline problems mainly for students who struggle with self-regulation. ST7 and ST8 positions explained that the autonomy in blended learning sometimes caused them to procrastinate and lose motivation.

Moreover, the findings revealed that 35.5% of students encountered problems accessing learning materials, including online textbooks and online content. Students ST9 and ST10 explained that although resources were available, they did not possess the necessary digital literacy skills to properly evaluate and use information ethically. These findings mirror studies which emphasised that university students need critical information literacy training in digital settings [15, 21].

The findings also showed that a substantial number of participants (79.4%) encountered technical problems, ranging from poor internet connectivity and difficulties navigating platforms such as Blackboard during the implementation of blended learning at BIUST during the Covid-19. The findings revealed that these problems went beyond the technical aspects. Participants (ST11 and ST12) explained that insufficient training on learning platform usage led to confusion, which negatively affected their learning speed. The findings support the conclusion that digital unfamiliarity stands as a primary obstacle for students to succeed in blended learning environments [1, 17].

Conclusion

The study revealed multiple challenges which teaching staff members and students faced when implementing blended learning at BIUST. The teaching staff members were particularly burdened by challenges, which included increased workload, insufficient training, and technical system interruptions. Students experienced difficulties in managing their responsibilities, accessing online resources and navigating digital platforms. These findings point to a pressing need for BIUST to improve their technical infrastructure while providing specific professional development and establishing formal and structured teacher and student support systems to deliver blended learning effectively and equitably.

Implications for Future Research

The study had implications. First, future research should investigate the fundamental reasons behind digital skill deficiencies in university students while developing lasting solutions and evaluating specialised professional development programs for blended learning environments.

Second, future research is vital to evaluate strategic interventions to address these challenges effectively so that higher education institutions can establish more resilient and inclusive blended learning systems.

Limitations of the study

The research took place at Botswana International University of Science and Technology (BIUST) as a single site, which restricts the ability to generalise results to other educational institutions with different infrastructure and student population characteristics. The research sample size was appropriate for case study research, but it might not have represented all possible experiences that exist between different faculties and

departments. The study's institutional focus and participant selection restricted the depth and representativeness of the gathered insights because of these limitations.

Recommendations

Based on the current study's findings, higher education institutions should invest in strengthening digital infrastructure to support uninterrupted online and blended learning delivery. Additionally, teaching staff should be offered continuous professional development programs focused on digital pedagogy, while students should be provided with targeted training in digital literacy and responsible online learning practices. Educational institutions like BIUST should also establish clear support structures, including help desks and peer-support networks, to assist both students and staff during future pandemics, which may result in abrupt transitions to new teaching pedagogies. Furthermore, inclusive planning models that involve important stakeholders at all levels should be adopted to ensure that implementation strategies are practical, equitable, and sustainable in future crisis contexts.

Conflict of Interest

The author is employed by the organisation where the study was conducted. However, the research was carried out independently and objectively.

Acknowledgments

The authors extend their deepest appreciation to the BIUST teaching staff and students who participated in this study by sharing their experiences of the transition to blended learning at BIUST during the Covid-19 pandemic. The research findings gained essential value from the insights and reflections provided by participants. The institutional leadership provided essential guidance, which helped researchers obtain access to important information and complete this work in an enabling environment. The authors would also like to appreciate the contributions made by peer reviewers who enhanced both the clarity and rigour of this article. The authors express their deepest gratitude to family members and friends who maintained their support and patience during the research period.

References

[1]. Dhawan, S., 2020, "Online Learning: A Panacea in the Time of COVID-19 Crisis," *Journal of Educational Technology Systems*, 49(1), pp. 5–22, Doi:10.1177/0047239520934018.

[2]. Desale, T., Kokande, M., Patil, D., Dhage, S., and Wagh, S., 2024, "ERP System for College Examination," *International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE)*, 13(4), Doi:10.17148/ijarcce.2024.134150.

[3]. Bond, M., Bedenlier, S., Marín, V. I., and Händel, M., 2021, "Emergency remote teaching in higher education: mapping the first global online semester," *International Journal of Educational Technology in Higher Education*, 18, Doi:10.1186/s41239-021-00282-x.

[4]. Rasheed, R. A., Kamsin, A., and Abdullah, N. A., 2020, "Challenges in the online component of blended learning: A systematic review," *Computers & Education*, 144, Doi:10.1016/j.compedu.2019.103701.

[5]. Mabuza, D. C., and Thwala, L. N., 2025, "Barriers to Effective Blended Learning for Consumer Science in Eswatini's Rural High Schools," *East African Journal of Education Studies*, 8(1), pp. 408–429, Doi:10.37284/eajes.8.1.2721.

[6]. Singun, A. J., 2025, "Unveiling the barriers to digital transformation in higher education institutions: a systematic literature review," *Discover Education*, Doi:10.1007/s44217-025-00430-9.

[7]. Woldegiorgis, E. T., 2025, "Challenges of integrating technology in East African higher

education systems in the post-pandemic era: emerging academic cultures," *Technology, Pedagogy and Education*, pp. 1–19, Doi:10.1080/1475939X.2025.2520589.

[8]. Abera, M., Bimenyimana, P. C., Abebe, S. M., Byungura, J. C., Ndikumana, R., and Jemal, M. W., 2025, "Challenges of Implementing E-Learning in African Universities: Experiences from Ethiopia and Rwanda," *Education Policy Analysis Archives*, 33, Doi:10.14507/epaa.33.8772.

[9]. Ghansah, B., 2025, "From crisis to opportunity: the digital evolution of higher education in Africa amidst the COVID-19 pandemic," *Discover Education*, 4(1), Doi:10.1007/s44217-025-00527-1.

[10]. Panday, A., Ray, T., Jalandharachari, A. S., and Gopinath, G., 2025, "Insights into blended learning research: a thorough bibliometric study," *Discover Education*, 4(5), Doi:10.1007/s44217-025-00439-0.

[11]. Price, E., and Winchester, T., 2025, "Designing for diversity: a scoping review of equity in higher education's blended learning practices," *Australian Educational Researcher*, Doi:10.1007/s13384-025-00859-9.

[12]. Merola, R. H., 2025, "Online learning's potential to improve access and quality in higher education in Mexico: Perspectives of higher education stakeholders," *Journal of Education and e-Learning Research*, 12(1), pp. 94–103, Doi:10.20448/jeelr.v12i1.6448.

[13]. Fernández, A., Gómez, B., Binjaku, K., and Meçe, E. K., 2023, "Digital transformation initiatives in higher education institutions: A multivocal literature review," *Education and Information Technologies*, 28(10), pp. 12351–12382, Doi:10.1007/s10639-022-11544-0.

[14]. Akram, U., Rakos, L., Petrosani, U. D., Solomon, R. A., and Fülöp, M. T., 2020, "The role of universities' sustainability, teachers' wellbeing, and attitudes toward e-learning during COVID-19,"

[15]. Ndibalema, P., 2025, "Digital literacy gaps in promoting 21st century skills among students in higher education institutions in Sub-Saharan Africa: a systematic review," *Cogent Education*, Doi:10.1080/2331186X.2025.2452085.

[16]. Sha, L., Wang, X., and Liu, T., 2025, "Understanding college students' acceptance of machine translation in foreign language learning: an integrated model of UTAUT and task-technology fit," *Humanities and Social Sciences Communications*, 12(1), Doi:10.1057/s41599-025-04888-8.

[17]. Sun, X., et al., 2025, "Application and effectiveness of blended learning in medical imaging via the technology acceptance model," *BMC Medical Education*, 25(1), Doi:10.1186/s12909-025-07293-6.

[18]. Musa, A. I., Ezra, G. S., and Monsurat, M. F., 2015, "Information and Knowledge Management Perceived Attributes of Diffusion of Innovation Theory as a Theoretical Framework for understanding the Non-Use of Digital Library Services," *Information and Knowledge Management*, 5(9), https://www.iiste.org

[19]. Menzli, L. J., Smirani, L. K., Boulahia, J. A., and Hadjouni, M., 2022, "Investigation of open educational resources adoption in higher education using Rogers' diffusion of innovation theory," *Heliyon*, 8(7), Doi:10.1016/j.heliyon.2022.e09885.

[20]. Kottara, C., Asonitou, S., and Kavalieraki-Foka, D., 2025, "A Conceptual Framework for Student Retention in an Advanced Financial Accounting Course: Traditional vs. Blended Learning Environments," *Trends in Higher Education*, 4(3), p. 30, Doi:10.3390/higheredu4030030.

[21]. Sha, L., Wang, X., and Liu, T., 2025, "Understanding college students' acceptance of machine translation in foreign language learning: an integrated model of UTAUT and task-technology fit," *Humanities and Social Sciences Communications*, 12(1), Doi:10.1057/s41599-025-04888-8.

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Investigating Barriers to Pre-Exposure Prophylaxis Uptake to Prevent HIV Among General Population of Sub-Saharan Africa Countries- A Systematic Review

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Abstract

Sub-Saharan Africa is one of the regions were the prevalence of HIV is high. Many strategies have been introduced to fight HIV in these countries including Pre-exposure prophylaxis (PrEP). The uptake of PrEP has been low in these countries thus this review aims to investigate the barriers to PrEP uptake among the general population of Sub-Saharan Africa countries. A systematic review was conducted and the research studies that were used were selected from google scholar and PubMed databases. Twelve (12) studies were analyzed to determine the barriers to Pre-exposure prophylaxis uptake among the general population of Sub-Saharan Africa countries. Majority of the studies revealed that barriers to Pre-exposure prophylaxis were stigma, fear of side effects, lack of knowledge, pill burden, lack of transport to the health facility, distance from the facility, attitude of health care workers and stock out of medications. There is need to increase PrEP awareness in these countries so to reduce the level of stigma attached to PrEP and improve access to health facilities.

Keywords: *Barriers, PrEP, Sub-Saharan African Countries, Uptake.*

Introduction

In 2024 there were 40.8 million people living with HIV globally, 25, 6 million of these people live in Sub-Saharan Africa [1]. The incidence of HIV in 2024 was 1.3 million worldwide. Adolescents account for 11% of the total population living with HIV in the world, the data also show that 44% of the incidence of HIV is adolescents [2]. Many countries in Sub-Saharan Africa like Eswatini, Zambia, South Africa and Zambia have intensified their fight against HIV. They have introduced measures such as voluntary male circumcision, large scale HIV testing, condom usage, prevention of mother to child transmission of HIV through the introduction of lifelong antiretroviral therapy (ART) for pregnant and breastfeeding mothers and Pre-Exposure Prophylaxis (PrEP) [3]. Even with the introduction of such measures, though there is a decline in the incidence of HIV most countries in Sub-Saharan Africa seem to be fighting a losing battle.

In 2015, the World Health Organization (WHO) recommended that PrEP must be introduced as an additional protection measure against HIV for individuals at substantial risk of HIV infection as part of the HIV comprehensive package [4]. Most countries in Sub-Saharan Africa decided to scale up PrEP use to reduce the incidence of HIV in the region in the same year [4]. PrEP is medication that reduces a person's chances of getting HIV, it is only prescribed for individuals who are HIV negative who are at risk of contracting HIV [5]. PrEP if taken correctly has a potential of reducing the risk of getting HIV through sex by 99% and by 74% among people who inject

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drugs [6]. There are two pills that have been approved for PrEP use, a combination of Truvada (Emtricitabine/Tenofovir Dispoxil Fumarate [5]. It can also be available as an injectable, two injectable were approved; Cabotegravir and Lenacapavir [6]. United Nations Programme on HIV/AIDS had a goal of at least 21.2 million people being initiated or should be continuing PrEP in 2023, they seem to have not reached this goal as only 1.5 million persons had been initiated or continuing PrEP [7]. Sub-Saharan Africa accounted for most individuals on PrEP with 82, 077 people, which shows a low uptake of PrEP yet that region has the highest incidence of HIV [7].

It is surprising why there is such a low uptake of PrEP in Sub-Saharan Africa, yet this is a measure that would probably go a long way in reducing the incidence of HIV in this region. In a study conducted in Eastern, Southern and western Africa, the participants stated that the factors affecting their PrEP uptake were fear of side effects, perceived stigma, PrEP use disapproval from parents and partners, healthcare providers stigma, isolated clinic set up.

Lack of resources and lack of partners' support were identified as some of the barriers to PrEP uptake [8]. This study proves that there is need for government to sensitize PrEP and response to such barriers which will allow a good uptake of PrEP. In another study conducted in Uganda, South Africa and Zimbabwe in 2021, the participants stated they encountered some challenges in accessing PrEP, their challenges were more or less the same as the above study [9], they further state that a total of 86.4% of the participants were willing take PrEP but they verbalized that the lacked information on what PrEP is, how to take it and where to find it, poor access to PrEP and financial problem. Both these studies suggest there is need for the government to address the barriers to uptake of PrEP if they wanted to be successful in the fight against HIV.

The purpose of this systemic review is to investigate the barriers to PrEP uptake in Sub-Saharan Africa, examine already existing data and what more needs to be studied. The research question is what are the barriers to PrEP uptake in Sub-Saharan Africa?

Methods

'The objective of this study is to investigate the barriers to Pre-Exposure Prophylaxis uptake among the general population of Sub-Saharan Africa countries. A preliminary search was conducted from three sources: google scholar, science direct and PubMed. Key words used were 'PrEP', 'barriers', 'Uptake, 'Sub-Saharan Africa'. Only studies that have been published in the last 5 years have been used as this allows one to obtain the latest form of data. Qualitative, quantitative and mixed study studies were reviewed in this review. Studies were reviewed based on the year of publication, country of study, study design and language, summary of the inclusion and exclusion criteria is listed on table 1. To conduct the review the PRIMA was used. Summary of PRIMA is illustrated on figure 1.

Inclusion and Exclusion Criteria

Table 1. Inclusion and Exclusion Criteria of Articles used in Review

Criteria	Inclusion Criteria	Exclusion Criteria
Year of publication	2020-2025	Articles published before 2020
Country of study	Articles from Sub-Saharan Africa	Articles outside Sub-Saharan Africa
Study design	Qualitative, quantitative and mixed method.	Experimental studies

Language	Articles written in English	Article written in any other language besides English.

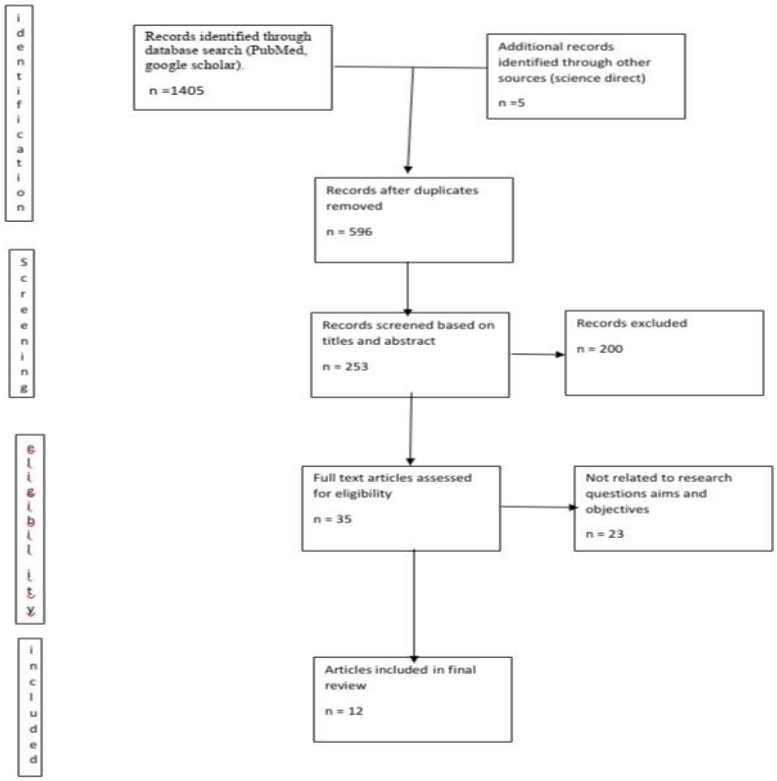

Figure 1. Prima Flow Chart

Results

A systematic review of literature was done, a total number of 1405 studies were found, a total number of 253 studies were eliminated because of their year of publication, and they were systematic reviews themselves. A further 53 studies were left and 41 of them were eliminated because of the country where the study were conducted. Eleven (12) articles were included in this study, 9 qualitative studies, 2 quantitative and one mixed method study. The results of the study were organized in a table with sub-divisions; Author, year of publication, methodology, results and conclusions (Table. 2).

Barriers to PrEP Uptake

In a study conducted in South Africa, Uganda and Zimbabwe, there were 24 group discussions with 6-8 participants, 60 in-depth interviews that were stratified by age, it was reported that barriers to PrEP uptake in this study were divided into individual level barriers; PrEP related stigma, pill burden, doubting PrEP efficiency, the complexity of timing and schedule of taking PrEP and PrEP characteristics [9]. Another study conducted in Namibia [10] where 20 potential PrEP users were interviewed gave different reasons for PrEP barriers from the above. Their study reported that barriers to PrEP uptake were due to lack of understanding, distance from health facility, health department non-compliant [10], though stigma on taking PrEP was reported by both [9-11]. Similarly, another study conducted in Malawi [11] that assessed barriers and facilitators of Oral PrEP uptake among adolescents and women , respondents revealed that their barriers to PrEP were fear of side effects of medication , lack of PrEP knowledge, lack of transportation and lack of conducted privacy, the findings of this study show similar

findings with a qualitative study that was done in Zambia [12],–respondents in this study verbalized that poor uptake of PrEP was due to the fear of side effects and lack of transportation to reach the facility.

Additionally in a qualitative study conducted in Kenya, the findings in this study concurs with that of [9, 12] reported barriers to PrEP were side effects of medication and stigma associated with PrEP. [13] Further stated other important factors of concern which are limited number of healthcare workers for PrEP distribution and administration limited and limited resources for routine screening and medication monitoring [13]. In a mixed method study [14] conducted in DRC that examined the low retention of PrEP and barriers to PrEP use among key populations in Kinshasa stated that stigma, side effects of medication, shortage of medication, pill burden were a major barrier to PrEP uptake in this study. These findings also concur with other studies [9-11, 13].

Side effects of medication based on misinformation and experience, fear of being mislabeled as having HIV, long waiting period and stock out at local clinic [15], were findings from a study conducted in Zambia they were trying to ascertain the barriers and facilitators to PrEP uptake and persistence of PrEP among key population. A qualitative study conducted in Eswatini also shared the same findings as the respondents also stated side effects of medication and stigma as the key barriers to PrEP [16] in that country.

A qualitative study conducted in Lesotho [17] revealed that barriers to PrEP uptake can be divided by three: individual factors; perceived side effects and PrEP daily regimen. Social factors: Lack of support and HIV related stigma. Structural factors; PrEP access, distance from facility and transportation cost. These findings are consistent with a finding of another study [18] which is done in multiple settings of Uganda among potential PrEP users assessed the knowledge and barriers of PrEP among diverse groups of potential PrEP users in Central Uganda.

A survey findings revealed that low perceived risk for HIV (76%), partners known HIV (72%), pill burden (2%), fear of side effects (8%), fear partner will find out (2%) and fear of intimate partner (2%) [19], were barriers to PrEP. The researcher examined the high awareness, yet low uptake among adolescent girls and young women.

Table 2. Summary of Articles on Barriers to PrEP

Author, year, country	**Title of study**	**Methodology**	**Major findings**	**Conclusions**
Nabunya et al (2023) Uganda	Barriers and Facilitators to oral PrEP uptake among high-risk men after HIV testing at workplace: A qualitative study.	Explorative and qualitative study comprising of in-depth interviews. Data was collected via telephone calls and manually analyzed by inductive content analysis.	Fifty-six (56) men participated. Barriers were Inaccessibility of PrEP services, misinformation, lack knowledge, Medication-related barriers, Potential for increased risky sexual behavior, and Perceptions about PrEP use.	The findings suggest the need for healthcare providers to offer information regarding PrEP and HIV prevention services and mass sensitization campaigns to facilitate uptake.

Sila et al (2020) Kenya	High awareness, Yet low uptake, Pre-exposure prophylaxis among Adolescents girls and young women with family planning clinics in Kenya.	Quantitative study (n= 470). Data was analyzed using STATA 15.0.	Barriers identified are low perceived risk (76%), partner known HIV negative (72%), pill burden (51%), fear of side effects (8%), fear partner will find (2%), fear of partner violence (2%).	PrEP counseling should be tailored to AGYW to guide appropriate PrEP decision-making in this important population.
Barnighausen et al (2020) Eswatini	"We know this will be hard at the beginning, but better in long-term: Understanding PrEP uptake in the general population in Eswatini.	Qualitative study. Semi-structured in-depth interviews were done,(n = 106).	Healthcare workers fear that PrEP will reduce condom usage and cause drug resistance. The clients feared side effects of medication and reaction of family members,	There is need for community PrEP promotion and delivery, shortening the PrEP initiation process and target men and adolescent girls in use of PrEP.
Gombe et al (2020) Zimbabwe	Key Barriers and Enablers associated with PrEP uptake and continuation of oral PrEP in public sector Zimbabwe: Qualitative perspective of general population clients at high risk.	Qualitative study. Semi-structured interviews were conducted among clients who agreed follow up (n=55), 42 from rural youth center, 13 from family planning clinic. The interviews were recorded, transcribed and coded thematically.	Respondents verbalized that the poor uptake of PrEP was due to the fear of side effects and lack of transportation to the healthcare facility.	Refine training materials for healthcare workers to be able to educate clients on PrEP use. Program advertisements should also be targeted with messages that speak to client's experience.
Stoebenau et al (2024) Zambia	Barriers and facilitators to uptake and persistence on PrEP among key population in Southern Province Zambia: A thematic analysis.	The study used a qualitative case study that followed sero0discorded couples, female sex workers, man that have sex with men in Livingstone. In-depth interviews were conducted (n=43). Guided by socio-ecological model and	Respondents had concerns about side effects based on misinformation and experience, fear of being mislabeled as having HIV, long waiting periods and stock outs at local clinics.	The recommendation for programming efforts going forward such as include PrEP awareness campaigns, expanding population sensitivity training and related thwart PrEP stigma while expanding access.

		focus group discussion n =4 with clinic and community-based provider and eligible clients. Thematic analysis was used to analyze data using codes derived both deductively and inductively.		
Zotova et al (2024) DRC	Low retention on PrEP and barriers to PrEP use among the key population in Kinshasa, DRC: a mixed method study.	A mixed-method study was conducted at key population friendly centers in Kinshasa, DRC. Data collected included programmatic data, extraction of routine and clinical records and qualitative interviews with female sex workers and man who have sex with men. Logistics regression was used to identify factors associated with PrEP retention. Qualitative data were analyzed thematically.	The barriers to PrEP were stigma, side effects of medication, dislike of daily medication shortage of key population friendly facilities.	There is need to raise awareness among Congolese general population which may help to avoid stigmatization of PrEP user and improve PrEP acceptance among key population at risk.
Muhumuza et al (2021) South Africa, Zimbabwe, Uganda	Exploring perceived barriers and facilitators of PrEP among young people I Uganda, Zimbabwe and South Africa	24 group discussions and 60 in-depth interviews, males and females aged 13-24, Uganda, South Africa, and Zimbabwe between Sep 2018 – February 2019.Framework approach to generate themes and key concepts for analysis by social ecological model.	Young people expressed willingness to use PrEP and identified potential barriers and facilitators of PrEP uptake. Barriers to PrEP were individual factors (fear of HIV, fear of side effects, PrEP characteristics), Interpersonal (parental influence, social stigma), Institutional (long waiting period,	The study showed that PrEP is an acceptable HIV prevention method. PrEP uptake is linked to personal and environmental factors that need to be considered for successful PrEP roll-out, multiple interventions needed to promote PrEP uptake should consider the society and structural drivers and focus on ways that inspire PrEP uptake and limit barriers.

			attitudes from healthcare workers, Structural (cost of PrEP, mode of administration, accessibility concerns) levels.	
Ashipala et al (2024) Namibia	Exploring factors hindering the uptake of HIV Pre-exposure prophylaxis by potential users in Namibia	This was a qualitative, exploratory, descriptive and contextual design. Peri-urban setting of Okongo District Hospital, Namibia. A purposive sampling method was used, were semi-structed interviews were conducted with 20 participants. Data was analyzed using thematic analysis	The results revealed that barriers to PrEP uptake were level of understanding, distances, insufficient stock, attitudes of health care workers, on-compliance on the part of the health department	Despite the PrEP roll-out, multiple obstacles continue to hinder PrEP uptake, especially on the outskirts of Okongo district. The study recognizes that there is need to word hand in hand with the support system of both potential users.
Nicholas et al (2025) Malawi	Barriers and Facilitators to oral PrEP uptake among adolescents' girls and young women at elevated risk of HIV acquisition in Lilongwe, Malawi: A qualitative study.	Exploratory qualitative study conducted at Kawale Healthcare center in Lilongwe, Malawi, February 2023, and phenomenological design was used. Semi-structured in-depth interviews were recorded digitally. Data managed using Nvivo software and analyzed using thematic approach.	The barriers to PrEP included side effects of medication, lack of PrEP knowledge, lack of privacy, stigma and lack of transportation.	There is need to create demand to increase the uptake of PrEP.
Gibson et al (2021) Kenya	Facilitators and barriers to PrEP uptake through community-based intervention strategy among adolescent girls and young woman in seme-sub country, Kisumu, Kenya.	This is a qualitative study involving adolescent girls and young women enrolled in the DREAMS Initiative at Pamoja Community Based Organization in Kisumu, Kenya. Informant interviews (n = 15) with Pamoja Community Based Organization staff, health care providers and community leaders.	Barriers to PrEP included stigma associated with the use of anti-retroviral drugs, drug side effects, frequent relocation of beneficiaries, limited resources for routine screening and medication monitoring, and a	The identified barriers should be addressed so that a larger scale-up of PrEP roll-out is possible in the future.

		Focus group discussions with young women receiving PrEP and peer mentors ($n = 40$). Data was analyzed using the Consolidated Framework.	limited number of qualified health care workers for PrEP distribution and administration.	
Chebert et al (2023) Lesotho	Motivation for PrEP-exposure prophylaxis uptake and decline in an HIV hyperendemic setting finding from qualitative implementation study in Lesotho.	In-depth interview, n=97(current PrEP users = 55, former PrEP users = 36, and PrEP decliners (n = 6)). Data was analyzed using thematic analysis.	Barriers to taking PrEP were divided into 3: individual factors; PrEP daily regime and side effects of PrEP. Social factors; lack of support and HIV related stigma. Structural factors; distance from facility and transportation costs.	Strengthening health provider counseling capacity; and (3) addressing societal and structural HIV-related stigma.
Muwonge et al (2020) Uganda	Knowledge and barriers of Pre-exposure prophylaxis among diverse groups of potential PrEP uses in Central Uganda.	A quantitative survey to potential PrEP users in multiple settings in Central Uganda. Sample size 250. Data was analyzed using Chi- square test and ANOVA.	The barriers to PrEP identified were stigma, transportation	Demand creation and HCW training will be critical for increasing PrEP awareness among key populations, with support to overcome barriers to PrEP use

Discussions

The findings of this review brought out different factors that are at play in the barriers of PrEP uptake from individual to social and structural factors. Individual level barriers identified significant barriers in this study, these included lack of knowledge, lack of awareness, misinformation about PrEP, fear of side effects, and fear of violence from partner. These study finding are consistent with a study done in USA, where they were assessing individual, social and structural factors influencing PrEP uptake among cisgender women. They further stated that if they were in violent relationships their partners will interfere with them taking PrEP [20]. Yet another study done in the USA again concurred that they feared the side effects attached to PrEP including vomiting, fever, and they lacked knowledge about PrEP the only knowledge they had was from social media [21]. These findings also prove that there is need for providing more education on PrEP at heath facilities, radios and communities, some information that are obtained from social media might not be necessarily true and they might lead to misinformation this leading to poor uptake of PrEP.

Societal factors were also evident, family reaction, reaction from friends and stigma. Participants feared their friends and family members would think that they were HIV positive if they saw them taking PrEP, again they feared the stigma attached to PrEP as most people would think they had more than on partner [21]. Another study highlighted the stigma with PrEP was real as people always say that you are having sex with HIV positive people [22]. The participants feared they would be labeled as promiscuous due to sexual stereotyping that they endured [21]. The stigma attached to PrEP seems to be the main reason to poor PrEP uptake, people need to be educated more about the importance of PrEP and what it is. Taking PrEP does have to necessarily mean you are being promiscuous, it is just an attempt to protect self from contracting HIV. There is need to increase PrEP awareness in the communities and interventions to reduce stigma.

Additionally identified structural factors as another barrier to PrEP uptake. These include lack of transport to the health facility, distance from the clinic, stock out and lack of trained professionals. In study conducted in Pakistan, participants revealed that it was difficult for them to reach the health care facilities due to lack of transportation, they went on to further state that they did not have the funds to assess PrEP [22]. There is need for training and support for healthcare workers to address the shortfall of lack of knowledge on providing PrEP. Health care facilities should be assessed by everyone if there is need, the service should be brought closer to the people through mobile clinics. Policy makers should create policies that allow PrEP to assess all individuals. There is also needed to sensitize PrEP to the population through health education to reduce the stigma and discrimination attached to PrEP. Addressing these barriers will help reduce the incidence of HIV as the uptake of PrEP will increase. Future studies should be done to explore the stigma experienced by PrEP users and one that would assess the knowledge and awareness about PrEP.

Conclusions

This systematic review highlighted the most important barriers to PrEP uptake. A comprehensive approach is required to be able to address these issues. These findings will assist policy makers in identifying the gaps that the ministry of health needs to cover by developing interventions that will improve access to PrEP such as training more healthcare workers on provision of PrEP, providing outreach services and building more health facilities that are closer to the population.

Limitations

Only studies published in Sub-Saharan Africa were reviewed, which might mean that there is a possibility of excluding rich information that might have been obtained from articles done in other parts of the world.

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Conflict of Interest

There is no conflict of interest.

References

[1]. United Nations Programme on HIV/AIDS (AIDS)., 2024, Global HIV and AIDS Statistics. http://unaids.org/en/resources/fact-shets.

[2]. Elizabeth Glaser Pediatric AIDS Foundation (EGPAF)., 2025, Adolescents and HIV. http://pedaids.org/adolescents-and-hiv.

[3]. HIV and AIDS in East and Southern Africa Regional Awareness Overview., Avert. 2019, http://www.avert.org/professionals/hiv-around-world-sub-saharan-africa/overvew

[4]. World Health Organisation. 2025, Pre-Exposure Prophylaxis PrEP, Global HIV Programme. WHO. Geneva. http://www.who.int/teams/global-hiv.

[5]. Center for Disease Control (CDC)., 2024, Preventing HIV with PrEP. http://www.cdc.gov/hiv/prevention/prep/html.

[6]. Global HIV/AIDS Organizations., 2025, Pre-Exposure Prophylaxis, HIV org. http://www.hiv.gov-basics/hiv-prevention/using-hiv-medication

[7]. Center for Disease Control (CDC)., 2024, Morbidity and Mortality Weekly Reports Progress Towards UNAIDS Global HIV Pre-exposure Prophylaxis Targets: CDC-supported Oral Pre-Exposure Prophylaxis-37 Countries 2017-2023. http://www.cdc.gov/mmusr/volumes/73/wr/mm7347a3.htm

[8]. Admassu, A., Nostlinger, C., & Hensen, B., 2024, Barrier to PrEP use and adherence among adolescent girls and young women in Eastern, Southern and Western Africa. *BMC Women's Health.* NO: 665.ISSN:14726874.

[9]. Muhunuza, R., Ssemata, A. S., Kakande, A., Ahmend, N., Atujura, M., & Mangxilana, N., 2021, Exploring Perceived Barriers and facilitators of PrEP Uptake among in Uganda, *Zimbabwe and South Africa*. Volume 50.1729-1742.

[10]. Ashipala, D. O., 2024, Exploring Factors hindering the Uptake of HIV Pre-Exposure Prophylaxis by potential users in Namibia. 2024. *S Afr J hv. Med.* 2024:25(1) 91561. http://doi.org/10.4102/sajhiumed.v25il.1561

[11]. Nicholus, S. C., Matewere, M., Bula, A., Tsidya, M., Hosseinnipour, M. C., Matoga, M., & Mipando, N., 2025, http://doi.org/10.1371/journal.pgph.0004006

[12]. Gombe, M. M., Cakourous, B. E., Ncube, G., Zwangobani, N., Mareke, P., Mkwambs, A., Prescott, M. A., Bhalasara, T., Murwira, M., Mangwiro, A., & Prust, M. L., 2020, Key Barriers and Enablers Associated with PrEP Uptake and Continuation of Oral PrEP in Public Sector Zimbabwe: Qualitative Perspective of General Population Clients at High Risk. *PLOS One.* 2020. Jan13; 15(11): e0227632. http://doi10:1371. *Journal.prone.*0227632. PMID: 31931514.

[13]. Gibson, J., Ezema, A. U., Orero, W., Were, I., Osasogie, O., Mbulto, P. O., & Hirschhorn, L. R, 2021. Facilitators and Barriers to HIV Pre-Exposure Prophylaxis Uptake through a Community-based Intervention Stratergy among Adolescent girls and young women in Semi-Sub-country. Volume:21. Article number: 1284(20210. http://10.1186/512889-021-11335-1

[14]. Zotova, N., Shongo, A., Lelo, P., Mbonze, N., Koba, D., Ntangu, P., Shi, Q., Adedimeji, A., Anastos, K., Yatobeina, M., Patel, V., & Ross, J., 2024, Low Retention on PrEP and Barriers to PrEP use among Key Population in Kinshasa, DRC: *A mixed method study.* http://doi.org/10.1101/2024.12.18.24318849.

[15]. Stoebenau, K., Muchaga, G., Ahmad, S. S., Bwalya, C., Muvale, M., Toussant, S., Maambo, C., Peter, C. J., Baumhart, C., Mwango, I. k., Lavoie, M. C., & Claassen, C. W., 2024, Barriers and Facilitators to Uptake and persistence on PrEP among Key Population in Southern Province in Zambia: *A Thematic analysis. June:* 17; 24(1). http://doi:10.1186/s12889-024-19152-y. PMID: 3886691.

[16]. Barnighausen, K., Matse, S., Hughey, A. B., Hettema, A., Barnighausen, T. W., & Machon, S. A., 2020, "We know this will be haard at the beginning, but better in long-term: Understand PrEP uptake in the general population in Eswatini. *AIDS Care*. http://doi:101080/09540121.2019.1653437. PMID: 31437021.

[17]. Chebet, J. J., Machon, S. A., Tarumbiswa, T., Hlalele, H., Maphonga, C., Mandora, E., Ernst, K., Alaofe, H., Baerninhausen, T., Ehin, J. E., Geldsetzer, P., & Nichler, M., 2023, Motivation for Pre-Exposure Prophylaxis Uptake and Decline in an HIV-Hyperendemic Setting: Finding from a Qualitative Implementation Study in Lesotho. *AIDS Res.Ther.*2023. Jul6; 20(1):43. http://doi:10.1186/512981.023.00535. PMID: 37415180.

[18]. Muwonge, T. R., Nsubuya, R., Brown, C., Nakyanzi, A., Bagaya, M., Bambia, M. et al., 2020, Knowledge and Barrier of PrEP Among Diverse

Groups of potential PrEP uses in Central Uganda. *PLOS one*.15 (10): e0241399. http://doi.org/101371/journal.pone.024/399

[19]. Sila, J., Larsen, A., KInuthia, J., Owin, G., Abuna, F., Kohler, P., John-Stewart, G., & Pinty, J., 2020, High Awareness, Yet Low Uptake, Pre-Exposure Prophylaxis Among Adolescent Girls and Young Women with Family Planning Clinics in Kenya. *AIDS Patient Care STDS.*2020 Aug: 34(8):336-343. http://10.1089.apc.2020.0037.PMID: 32757980.

[20]. Tietelman, A. M., Hong-van, T., Flores, D., Bannon, J., Brawne, B. M., Davis, A., Gurgerty, P., & Koblin. B., 2021, Individual, Social, and Structural Factors Influencing PrEP Uptake Among CSgender Women: A theory-informed elicitation study. *AIDS Care.*2021 March 9:34(3):273-283. http://doi:10.1080/09540121.2021.1894319

[21]. Crook, N., Singer, R. B., Smith, A., Donenberg, S. Mathews, A. K., Patil, C. L., Haider, S., & Johnson, A., 2022, Barriers to PrEP Uptake among Black Female Adolescent and Emerging Adults.*Science direct.* http://doi.org/10.1016/j.pmedr.2022.102062

[22]. Samo, R. N., Jamali, M. S., Mahmood, S. F., Umar, R., Mustafa, K., & Muhamand, S. J., 2025, Understanding Barriers to HIV Pre-Exposure Prophylaxis Initiation Among Men who have Sex with Men in Sindh, Pakistan. *International Journal of STD and AIDS.* Jul; 36(8):649-654. http://doi.10.1177/09564624251344419. PMID: 40396384.

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Drug-Abuse and Prevention Strategies Among Secondary-School Athletes Participating in Football and Athletics in Port-Loko District, Northwest Region, Sierra Leone

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Abstract

This study investigates the prevalence of drug abuse among secondary schools' athletes participating in football and athletics within the Port-Loko District, North-west-region of Sierra Leone. Rising concerns about the impact of drug use on athletic performance, health, and academic success necessitated a comprehensive analysis of the factors contributing to substance abuse in this demographic through a mixed methods approach, including surveys/questionnaire, interviews and focus group-discussions with athletes, coaches, sport masters and parents. The research identified key trends in drug consumption, motivation behind usage, and the socio-economic factors influencing these behaviors. The population of the study included 400 pupils athletes in selected secondary-schools within Port-Loko District formed the population and sample size 200 was done by simple random sampling and purposive sampling. Data was collected with instruments like questionnaires, interviews and focus-group-discussions. Data was analyzed using the IB-SPSS software version 25 and results translated into tables and charts. Findings revealed that considerable proportion of athletes are exposed to various substances, predominantly stimulants, and performance-enhancing drugs, often driven by the pressures to excel in sports and the absence of adequate knowledge regarding the risks associated with drug use. The research underscores the critical role of peer-influence, accessibility of drug, and the need for improved educational resources. In response to these findings, the research proposes targeted prevention strategies tailored to the unique-environment of secondary-school sports. Recommendations include the implementation of comprehensive drug-education-program, increase involvement of stakeholders and parents in sports education, and the establishment of support system that encourage healthy-life-style choices among youth-athletes.

Keywords: *Athletics, Drug-Abuse, Participation, Prevention, Strategies, Secondary-School-Athletes.*

Introduction

Drug abuse among adolescence is a significant public health concern, particularly in regions where youths engage in sporting activities. This research article aims to investigate the prevalence of drug abuse among secondary school athletes actively involved in sports in Port Loko district Northwest Region, Sierra Leone and to identify effective prevention strategies tailored to this demographic. Drug abuse in Port Loko District and by extension Sierra Leone in the contemporary time has become one issue that cast a gloomy shadow to the entire Sierra Leonean society especially among secondary school athletes. The height of drug trafficking issues in Sierra Leone has surged recently with a good number of youths and adults involved in its use and abuse.

Nevertheless, the usage of drug either by secondary school athletes or other members of the larger society in all its ramifications

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appears to be a community social problem. This problem is widely spread and it affects all and sundry. In order words, this wide spread use and abuse entice people from all works of life and beyond the human destruction caused by drug dependence is the damage to traditional and life style. Studies have also shown that drug abuse wrecks individual, shatter families and weakens entire society with its burden of economic loses, health cost and increased lawlessness and crime. The effects of drug abuse on student athletes are multifaceted, impacting physical health, mental well-being, and academic performance. Research by Jalloh et al,[1], 2023 indicates that drug abuse can lead to a range of physical health issues, including cardiovascular problems, liver damage, and hormonal imbalances. Psychologically, athletes may experience increased anxiety, depression, and a higher risk of developing substance use disorders. Academically, drug abuse is associated with decreased concentration, lower grades, and higher dropout rates [2], Kamara & Sesay, 2024. Doping, defined as use of drugs or other substances for performance, improvement has become an important subject in virtually every sport and has been discovered in athletes of all ages and at every level of sports competition, for rates of use of a variety of substances, whether doping agents or recreational substances, among different populations of athletes as reported in various recent research studies. Athletes, too, can fall prey to the temptation to turn to heroine after abusing painkillers. In recent years, there have been a lot of apprehensions about the transition from painkiller abuse to heroin use and addiction.

Drug and substance abuse has led to many problems in secondary schools especially strikes and disturbances of cliques which ever normally experienced in schools at normal school sessions or during inter house Games and Track and field events Athletics competitions.

The adolescent years are critical for development, and participation in sports can have both positive and negative influences on youth behavior, while sports can promote healthy lifeless, they may also expose students to drug use either as a means of enhancing performance or due to peer pressure, understanding the dynamics of drug abuse in the context is essential for developing effective prevention strategies. The intake of drugs by secondary school Athletes in Port Loko.

Secondary schools are becoming a very serious case. Recently, most of the many troubles caused by students in Port Loko District secondary schools are as a result of drug abuse. Few years ago, a female pupil was stabbed and killed by a male pupil and when the case was investigated the male pupil was found to abused too much of drugs [3] Criminal investigation Department police F, division Port Loko District 2023.There are so many instances in Port Loko District secondary schools, where pupils have confronted their teachers physically because these students were caught red handed by their teachers abusing drugs [4], school authorities, Port Loko District secondary schools, 2021.

Against this background and judging from the problems outlined above, this research ascertaining drug abuse and prevention strategies for junior and senior secondary school Athletes in Port Loko District as a study area.

Aim

The aim of this study is to investigate Drug abuse and Prevention Strategies among Junior and Senior Secondary School athletes participating in Football and Athletics in Port Loko District, Northwest Region, Sierra Leone.

Objectives

1. To investigate Drug abuse and prevention strategies for junior and senior secondary

school Athletes in Port Loko District.

2. To assess the prevalence and types of drugs abused among Junior and senior Secondary athletes participating in sports in Port Loko District.
3. To identify factors (social, environmental psychological) contributing to drug abuse among secondary school athletes in Port Loko District.
4. To promote tailored prevention strategies in addressing drug abuse among secondary school athletes and their effectiveness.
5. To identify the effects of drug abuse on student athletes in Port Loko District.
6. To examine methods of abusing drugs by student athletes in Port Loko District
7. To recommend suitable measures to combat drug abuse in Port Loko District.

Methods

Population

400 hundred secondary schools athletes who participate in football or track and field athletics in Port Loko District.

Sample

A representative sample of 200 athletes from various schools ensuring diversity in term of gender and types of sport. Data collection instrument are structured questionnaire are developed that includes demographic information. Use of observation checklist, interviews and focus group discussion.

Findings and Discussions

Table 1. Respondents' Perception on commonly Abused Drug

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alcohol	24	12.0	12.1	12.1
	Marijuana	26	13.0	13.1	25.3
	Tramadol	34	17.0	17.2	42.4
	Kush	57	28.5	28.8	71.2
	Tabacco	30	15.0	15.2	86.4
	Ataya	27	13.5	13.6	100.0
	Total	198	99.0	100.0	
Missing	System	2	1.0		
Total		200	100.0		

Table 1. above clearly display and demonstrate the most commonly drug abuse in the northwest region of Port Loko district and in the country of Sierra Leone as a whole. The research survey results indicate that 28% is the most commonly drug abuse that is 'Kush, 17% involves the abuse of tramadol, 15% represent tobacco, 13% involves the misuse of Marijuana, 13% involves in Ataya and 12% are involved in the misuse of alcohol. The problem of athletes turning to addiction is not one that happens in isolation. Research indicates that misusing controlled substances takes place across all sports and athletic competitions. Various aspects of athletic life are conducive to drug misuse; in addition to performance enhancement, athletes take drugs (or are given drugs to take) to medicate injuries, and to deal with mental and emotional stress that comes from life on and off the field, track, court, or ring, and even after retirement. Consuming these drugs (especially in a high-pressure and high-risk environment, like professional sports and athletics) presents a significant risk of developing an addiction to them.

Table 2. Respondents' Opinion on Reasons for Drug Abuse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	performance enhancement	42	21.0	21.1	21.1
	pressure to win	42	21.0	21.1	42.2
	Coping with stress	29	14.5	14.6	56.8
	help them in their studies	32	16.0	16.1	72.9
	to be bold and brave	41	20.5	20.6	93.5
	peer group influence	13	6.5	6.5	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Table 2. overhead illustrate the opinion of respondents interviewed on the reasons of drug abuse among athletes. The research result bound that 21% of drug abuse among athletes is because of ''performance enhancement, 21% again is for pressure to win, 20% is to be bold and brave, 16% is to help them in their studies while 14% signify coping with stress and 6% is due to peer group influenceAddiction and substance use amongst athletes can be hard to overcome due to the stigma of addiction. Listen to our Addiction Talk interviews with past and present professional athletes and their struggles with addiction. When athletes abuse substances whether it's drugs or alcohol, it's usually to cope with behavioral health issues going on such as anxiety, depression, or an eating disorder. It can also be driven by a desire to fit in with their peers simple description of the effects of using drugs is often more effective than a long lecture filled with drug horror stories. Using short, to-the-point descriptions of the negative effects of drugs -- such as those listed below -- will work well in capturing your students' attention and keeping them engaged. Drugs can have lasting effects on the brain and body. Using drugs often compromises judgment and physical abilities and makes a person unable to perform in a variety of contexts: Academics, Athletics. Music or dramatic arts, Decision making in everyday situations, Driving any kind of vehicle. Operating equipment or tools.

Table 3. Respondent Perception on Sources of Drug

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ghettos	68	34.0	34.2	34.2
	drug sellers	56	28.0	28.1	62.3
	drug traffickers	25	12.5	12.6	74.9
	peer group	50	25.0	25.1	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Table 3. surface elaborate on the sources of drug abuse among athletes. the views of respondents interviewed on the sources of drug is that, 34% of drugs are from ghettos, 28% are from drug sellers, whereas 25% are from peer group while 12% are from drug traffickersDuring the past two decades, prevention specialists have responded to

concerns about youthful substance use by developing a variety of programs. The most effective of these programs have been based upon our understanding of the risk and protective factors involved. While student-athletes generally share the same level of risk as other high school students, as a group, they may have other characteristics that can be considered. In addition, the special socializing experience of participating in athletics may present special opportunities for prevention. Exposure to alcohol and popular drugs of abuse such as kush, tobacco, tramadol, Ataya, marijuana, cocaine and club drugs among adolescents and young adults in high school, college and the work force is a common, though disturbing, phenomenon. Such exposure is often viewed as "normative" (both statistically and developmentally) even though the contact carries with it potentially serious and even life-threatening consequences. The most prevalent experience among adolescents and emerging adults is with beverage alcohol though exposure rates to street drugs such as tramadol, kush, ataya, marijuana and ecstasy remain significant [5] (Johnston & O'Malley, 2001). Heavy drinking and experimenting with other drug use have been viewed as "rites of passage" for many students not only in college [6] Vicary & Karshin, 2002 but also those transiting the high school years al, 2021.

Table 4. Respondent Perception on Methods of Abusing Drug

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Smoking	37	18.5	18.9	18.9
	drinking	50	25.0	25.5	44.4
	sneezing	42	21.0	21.4	65.8
	injection	28	14.0	14.3	80.1
	piercing of the skin	39	19.5	19.9	100.0
	Total	196	98.0	100.0	
Missing	System	4	2.0		
Total		200	100.0		

Table 4. above demonstrate the persuasion of respondents interviewed on the methods of drug abuse among athletes. The investigating result précis that 25% of the athletes do drinking including the taking of tramadol, 21% sniff drug, 19% do the piercing the of skin in taking drug whereas 18% do smoking and 14% do the injection taking of drugs. 55% of students did not participate in any school sports and 32% reported substance use. Intramurals were negatively associated with cannabis, tramadol, kush use and cigarette use among all students and e-cigarette use among females. Varsity sports were associated with lower odds of cigarette use among all students and cannabis, kush, tramadol use among males. In contrast, participating in varsity sports was associated with increased odds of binge drinking, smoking, injecting, sniffing and e-cigarette use among all students. Participating in both intramurals and varsity sports was associated with increased odds of binge drinking and e-cigarette use but with decreased odds of cannabis use and cigarette use [7].

Table 5. Respondents' Opinion on Drug Prevention

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Health Education	55	27.5	27.5	27.5
	Parents and teachers involvement	29	14.5	14.5	42.0
	seminars and sensitization of drug abuse	25	12.5	12.5	54.5
	implementation of drug policy	54	27.0	27.0	81.5
	peer group restriction	37	18.5	18.5	100.0
	Total	200	100.0	100.0	

Table 6. Respondents Perception on Effects of Drug Abuse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	mental problem	56	28.0	28.3	28.3
	criminal practices	50	25.0	25.3	53.5
	poor academic performance	40	20.0	20.2	73.7
	always desperate	39	19.5	19.7	93.4
	fatigue and lack of attention	13	6.5	6.6	100.0
	Total	198	99.0	100.0	
Missing	System	2	1.0		
Total		200	100.0		

Table 5. overhead display the opinion of respondents interviewed on the prevention of drug among athletes. The survey indicated that 27% of the respondent interviewed demands Health education, 27% demand the implementation of drug policy whereas 18% favoured peer group restrictions, 14% favoured parents and teachers' involvement and 12% demands seminars and sensitization on drug abuse among the athletes. Preventing drug use among athletes and students involves creating a supportive environment, implementing comprehensive drug education programs, and addressing risk factors early on. This includes fostering positive peer relationships, developing strong values, and promoting healthy lifestyles. Integrate drug education into the curriculum, promote healthy coping mechanisms, foster positive school environment, involve parents and families, build self-esteem and confidence, promote healthy relationships, Make it a school-wide effort [8] Drug Enforcement Administration, 2024.

Table 6. above show the perception of respondents interviewed on the effects of drug abuse among athletes. The result outcomes designate that 28% will be having mental problem, 25% will be involving in criminal practices, whereas 20% leads to poor academic performance, while 19% present always desperate and 6% leads to athlete's body fatigue and lack of attention. The risk factors that affect both sports activities and drug abuse, such as the feeling of physical disproportion and desire for slimming and fitness, should be considered and their related interventions should be designed. Effective monitoring should increase on sports halls out of university - As one of the possible areas for

recommending and encouraging female athletes to use various types of harmful drugs. Preventive programs should be designed for drug abuse both separated and specialized – in terms of time and content- for males and females and consider their psychological and social differences. Expanded student sports teams and students - especially females – should have been encouraged to participate more in them. The findings of this study suggest that membership in sports teams of a college, especially for females should be expanded, and preventive programs should be designed through sport in a professional way – in terms of timing and content- for males and females.

Table 7. Respondents Perception on Suggestion to Pupils Abusing Drug

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	campaigns and senimars on drug abuse	57	28.5	29.1	29.1
	constant monitoring and counselling	25	12.5	12.8	41.8
	drug policy enforcement	26	13.0	13.3	55.1
	parents, teachers and community involvment	26	13.0	13.3	68.4
	ban of all clubs	42	21.0	21.4	89.8
	abstain from peer group	20	10.0	10.2	100.0
	Total	196	98.0	100.0	
Missing	System	4	2.0		
Total		200	100.0		

Table 7. surface show respondent suggestion of handling drug abuser among school athletes. The survey revealed that 28% present e campaign and seminars on drug, 21% is to ban all clubs, while 13% is to implement drug policy, whereas 13% is the involvement of parent and teachers, 12% is to constant monitoring and counseling and 10% is to abstain from peer group influence. An important step in addressing this issue of substance abuse is through prevention, which may be in the form of team- and community-based didactic education programs [9], Reardon & Creado, 2014. Athletes who may already be struggling with substance abuse should be seen by clinicians, who can help them through empathetic motivational interviewing [10] Reardon & Creado, 2014. When counseling young athletes, clinicians should address their goals (i.e., sport versus life after sport) and discuss any conflicts between personal values and drug-behaviors they may be facing [11] Reardon & Creado, 2014. Although resistance may be felt by athletes towards clinicians when discussing drug abuse, clinicians should avoid argument and propose different alternative ideas without imposing, heavily suggesting, or insisting upon them.

Perhaps the most important thing clinicians, family members, and community members can do to address this issue is encourage athlete self-worth/efficacy.[12] Reardon & Creado, 2014. In other words, we need to ensure that athletes know they are “good enough”, and that “winning”, or “success” should not be dependent on the inappropriate use of substances, rather hard work and determination. Athletes who are physically dependent on drugs, though, may need pharmacologic interventions (such as naltrexone for opioid and/or alcohol dependence) [13] Reardon & Creado, 2014.

The Study Revealed that:

1. The types of drugs students abused in school included Alcohol, Marijuana, Tobacco cigarettes, cigar,' Tabataba', Tranquilizers, Coffee, Tea, Ataya, Cocaine, Kush, tramadol etc.
2. Sources of drugs for pupils are from Ghettos, peer group, Drug stores, drug dealers
3. Methods of abusing drugs in schools include- smoking, d, Sniffing and Injecting
4. Drug abuse is very detrimental/harmful to the health of pupil athletes
5. Drug abuse will lead to indiscipline to the school and sports
6. Drug abuse will lead to poor performance in academic studies
7. Drug abuse will lead pupil athletes to commit socio-economic problems in the community, i.e., stealing, gambling, fighting, disobedience and insolence to elders in the community

Reasons for Pupil Athlete's Abuse of Drugs in Schools Included:

1. To be brave and bold
2. To imitate parents/elders.
3. Peer group influence.
4. Lack of jobs/ employment
5. Help them in their studies.

Strategies of the School for the Prevention of Drug Abuse Include:

1. Educating pupils on drug abuse and its effects
2. Guidance and counseling sessions
3. Seminars, workshops, Sensitization
4. destruction of all Ghettos around school community
5. Enhance policies and enforce strict disciplinary measures against drug abusers e.g. Suspension/expulsion of pupils abusing drugs
6. Peace building mediation on drug abuse
7. Experience sharing
8. Collaboration of school authorities, law enforcement officials, and community stakeholders

Constraints/ Problems on Drug Abuse in School Included:

1. Lack of funds to organize seminars/workshops on drug abuse
2. Disciplinary problem
3. Lack of cooperation from parents, law enforcement officials and school authorities for students using drugs
4. Inadequate resources
5. Inadequate guidance counseling on drug abuse in secondary schools
6. Lack of attention and retention of students in class
7. Lack of transport facilities
8. Effective NGOs involvement to fight against drug abuse
9. The police and the school not working together.

Justification

The research provides valuable insight into the issue of drug abuse among adolescents in Port Loko District and contributing to the development of effective prevention strategies. The findings will be beneficial for educators. policy makers and health professionals, stakeholders working to promote healthy behaviors among youths. The impact of sports participation is often associated with positive outcomes such as improved physical health, social skills, and academic performance. In conclusion, the justification for studying drug abuse among secondary school athletes actively participating in sports is multifaceted encompassing public health education, social and policy dimensions. By addressing this issue, the study aims to contribute to the development of effective prevention strategies that promote healthy behaviors and supports the well-being of young athletes.

Conclusion

The research concluded that:

1. There is abuse of drugs by pupil athletes in secondary schools in Port Loko District
2. Pupil athletes get these drugs from various sources
3. That pupil athletes use different methods of abusing drugs like smoking, sneezing, injecting and drinking
4. That all harmful/dangerous drugs are detrimental to the health of pupil athletes
5. That drug abuse will lead to criminal offences and indiscipline in communities
6. That a number of reasons advanced for pupils abusing drugs are not tangible enough for personal wellbeing but detrimental to pupils' health.

Recommendations

From the findings and conclusion, the study recommends that:

1. In order to address the extent of drug abuse in secondary schools, each school should set up and update strict rules and regulations against the practice among pupils. These rules and regulations should be displayed publicly so that both staff and pupils become aware of them. Parents and guidance be notified about such rules and regulations in the school during Community Teachers; Association meetings (CTA meetings)
2. Every School Board of Governors and Management should appoint an effective team of interested, committed staff and community members to plan and carry out drug prevention strategies and intervention programs. Such programs may include needs assessment of staff and students to gain an understanding of root causes and the dissemination of information on drug use and abuse to parents, / guardians, stakeholders and students.
3. School Boards of Governors in conjunction with the Ministry of Basic and Senior Secondary Education should set up well equipped and formidable Guidance Counseling units in all schools to advice on the dangers of drugs use and abuse among students. These units should also seek out drug users among pupils and refer such cases to medical personnel for therapeutic treatment.
4. School Boards of Governors and management should institute stringent permissive measures to discourage students from drug use and abuse.
5. School Boards of Governors and Management should investigate and endeavor to discover drug dealers among pupils. If found, such drug dealer should be punished accord and persuaded to abandon the practice.
6. Government, non- Governmental Organizations and school management must embark on nationwide sensitization campaign on drug use and abuse. Organizing rallies, radio and television discussions, posters and public lectures.
7. Government through the police department ensures that barn or removal of all areas or places or places around schools where drugs are sold/used. Owners of ghettos and places should be warned initially and punished if they resisted admonition.
8. School management and staff must search for areas/places found around the school premises and inform the police for action.
9. Government must institute policies and ensure that negative drug advertisement is banned or removed from the mass media, Radio/television must be made not to carry any publicity on drugs and drug related substances.

Conflict of Interest (COI)

The researcher considered conflict of interest as a crucial and very important factor that will undermine the success of any research work. Therefore, the researcher

decided to be not a party that will undermine his investigation. He therefore, makes it abundantly clear not to associate in any circumstances that will undermine or influence his research decision.

In the first instance the research is funded by him alone, he has no personal relationship, no professional affiliation, no perceived notion of biasness in data interpretation and ensuring transparency in methodology and findings.

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References

[1]. Adams, R., & Green, T., 2024, The impact of drug abuse on academic performance among student athletes. *Journal of Sports Medicine*.

[2]. Amiek, B., 1978, Abuse of chemical substances. *South Africa.*

[3]. Arif, Hughes, Khant & Shafique., 1992, methodology of collecting data *UNESCO publications.*

[4]. Awake magazine, 1996, National house hold survey on drug abuse, page 74-75. America

[5]. Bai, A., Jalloh, M., & Sesay, M., 2022, Peer Influence and Drug Abuse Among Student Athletes in Sierra Leone. *Journal of Adolescent Health*, 70(3), 456-463.

[6]. Bangs, B., 2001, Drug and related problems in Sierra Leone. Pamphlet. Freetown. *Private printing press.*

[7]. Bangura, N. A., 1998, Drug use, misuse in Sierra Leone. Pamphlet. *Private printing press.*

[8]. Beck, 1987, Effects of drugs to students. Press conference release. *Freetown.*

[9]. Brima, 1999, World Tobacco Day. Ministry of Health and sanitation. *Sierra Leone.*

[10]. Browne, J., & Smith, L., 2022, Peer influence and drug use in adolescent athletes. *International Journal of Adolescent Health.*

[11]. Fofana, A., & Kamara, S., 2024, Drug Policy and Its Impact on Student Athletes in Sierra Leone. *International Journal of Drug Policy*, 102, 103-110.

[12]. Johnson, M., & Lee, A., 2022, Cannabis use among student athletes: A growing concern. *Sports Health Review.*

[13]. Johnson, R., & Lee, T., 2022, Alcohol Use Among Adolescent Athletes: A Review of the Literature. *Substance Use & Misuse,* 57(5), 678-689.

[14]. Kanu, A., Koroma, M., & Sesay, J., 2024, Methods of Drug Abuse Among Student Athletes: A Qualitative Study. *African Journal of Sports Medicine,* 12(1), 34-42.

[15]. Kanu, F., Osei, A., & Thompson, R., 2024, Drug abuse prevention strategies in secondary schools: A case study in Sierra Leone. *African Journal of Public Health.*

[16]. Koroma, M., Jalloh, M., & Fofana, A., 2025, Prevention Strategies for Drug Abuse Among Student Athletes: A Comprehensive Review. *Journal of Substance Abuse Treatment,* 120, 45-52.

[17]. Miller, S., & Johnson, P., 2022, The role of education in preventing drug abuse among athletes. *Journal of Health Education.*

[18]. Nguyen, T., Smith, J., & Browne, L., 2023, Peer support systems in sports: A preventive measure against drug abuse. *Journal of Youth Sports.*

[19]. Osei, A., & Kanu, F., 2024, Parental involvement in drug abuse prevention among student athletes. *Journal of Family Studies.*

[20]. Smith, J., Thompson, R., & Lee, A., 2021, Performance-enhancing drugs in youth sports: A review of the literature. *Journal of Sports Science*.

[21]. Smith, L., Thompson, R., & Kamara, S., 2021, Types of Drugs Abused by Student Athletes: A Systematic Review. *Sports Medicine*, 51(4), 789-802.

[22]. Thompson, R., 2023, The perceived benefits of drug use among student athletes. *Journal of Sports Psychology*.

[23]. Thompson, R., Jalloh, M., & Bai, A., 2023, The Perception of Success in Drug Use Among Student Athletes. *Journal of Youth Studies*, 26(2), 123-135.

[24]. Williams, D., & Green, T., 2023, Health consequences of drug abuse in adolescent athletes. *Journal of Adolescent Health*.

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Uptake and Satisfaction with NHIA: A Study of Formal and Informal Sector Employees in Kano, Nigeria

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Abstract

Universal health coverage (UHC) is a global imperative, yet Nigeria's National Health Insurance Authority (NHIA) continues to reflect deep inequalities, particularly between formal and informal sector workers. This cross-sectional comparative study surveyed 440 NHIA enrollees (205 formal, 235 informal) from all 44 Local Government Areas in Kano State, Nigeria, to assess NHIA uptake, satisfaction, and service utilization. Participants were adults enrolled for ≥6 months and had accessed NHIA-accredited outpatient services in the preceding three months. Socio-demographic characteristics, enrollment pathways, satisfaction across financial and service domains, and key predictors of satisfaction and continued enrollment were analyzed. Formal sector workers reported higher NHIA awareness (87.3% vs. 83.0%), longer enrollment duration (≥7 years: 27.6% vs. 5.6%; p*<0.001), and greater satisfaction across financial indicators including co-payments (81.4% vs. 31.1%;* p*<0.001) and co-contributions (71.7% vs. 28.5%;* p*<0.001). While 98.5% of formal and 98.3% of informal respondents desired to continue enrollment, informal enrollees were significantly more likely to report neutrality on key satisfaction metrics. Notably, informal respondents were more likely to believe that NHIA improved their health (66.8% vs. 36.1%;* p*<0.001). Qualitative data highlighted affordability, trust, and family coverage as motivators, but also underscored persistent awareness and access barriers for informal workers. While satisfaction with NHIA services is high overall, structural disparities persist between sectors. Formal workers benefit from embedded payroll systems and employer facilitation, whereas informal enrollees face awareness, affordability, and access barriers. Targeted reforms such as simplified enrollment, premium subsidies, and expanded community outreach are essential to achieve equitable UHC in Nigeria.*

Keywords: *Equity, Informal Sector, NHIA, Nigeria, Service Satisfaction, Universal Health Coverage.*

Introduction

The 1978 Alma-Ata Declaration affirmed health as a fundamental human right and called for "Health for All" through universal access to primary care, equity, and financial protection [1, 2]. More than four decades later, this vision remains elusive in many low- and middle-income countries (LMICs), where health systems are underfunded and access to essential care remains inequitable. In Nigeria, one of Africa's largest and most populous nations, health financing is dominated by out-of-pocket (OOP) payments, which account for more than 70% of total healthcare expenditures among the highest rates on the continent [3, 4]. This heavy reliance on OOP financing exposes households to catastrophic health expenditures (CHE) [5, 6], often leading to delayed care, treatment abandonment, or medical impoverishment [7].

Nigeria's health system mirrors global inequities, where access to quality care is stratified by income, geography, and

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employment status [8, 9]. Wealthier, urban residents tend to access better-equipped facilities and specialized services, while poorer and rural populations often contend with under-resourced public clinics or avoid care altogether. Recognizing these disparities, the Nigerian government launched the National Health Insurance Scheme (NHIS) in 2005 now transitioned to the National Health Insurance Authority (NHIA) under the 2022 Act to promote universal health coverage (UHC) by reducing financial barriers and enhancing access to quality care [3].

As of recent estimates, health insurance coverage in Nigeria stands at under 10%, with only approximately 3% of the population enrolled through the formal NHIS/NHIA channel [10, 4]. Enrollment is heavily concentrated among formal sector employees, particularly federal civil servants [11], due to structured payroll deductions and automatic scheme participation. In contrast, the vast informal sector which constitutes over 80% of the Nigerian labour force remains largely excluded [11]. This exclusion not only undermines UHC goals but perpetuates deep inequalities in health service utilization and financial protection [3, 11].

Barriers to NHIA enrollment among informal sector workers include irregular income, limited scheme awareness, administrative complexity, and skepticism regarding benefit reliability [12, 13]. Even among those enrolled, satisfaction with NHIA services varies widely. Studies suggest that perceived quality of care, responsiveness, availability of essential drugs, and waiting time all influence beneficiary satisfaction [14] which is a critical determinant of trust, retention, and continued participation [15]. Yet, few studies have directly compared satisfaction and access experiences between Nigeria's formal and informal sectors, two groups with vastly different socioeconomic profiles, expectations, and modes of insurance engagement.

This study aims to fill that gap by examining NHIA uptake and satisfaction in Kano State a populous and culturally diverse region in northern Nigeria that reflects the broader national mix of employment types and healthcare access challenges. By assessing sector-specific disparities in enrollment pathways, service perceptions, and satisfaction levels, this research provides actionable insights for health policy reform. The findings contribute to the evidence base needed to expand equitable coverage, particularly among underserved informal sector populations, and inform broader efforts towards achieving UHC in Nigeria and comparable LMIC settings [16].

Methods

Study Setting

This study was conducted in Kano State, located in northwestern Nigeria. As the most populous state in the country, Kano is home to more than 9.4 million residents according to the 2006 national census. It shares borders with Katsina, Jigawa, Bauchi, and Kaduna states. The capital city, Kano, is Nigeria's largest urban center and a major commercial and cultural hub. The population is predominantly composed of Hausa-Fulani Muslims, with minority Christian groups concentrated in urban districts.

Administratively, Kano comprises 44 Local Government Areas (LGAs), including 8 metropolitan and 36 rural LGAs. The economy is largely informal, with most residents engaged in subsistence farming, trading, and small-scale businesses. A smaller proportion is employed in the civil service or organized private sector.

The state's healthcare infrastructure includes two federal tertiary hospitals, three state-owned teaching hospitals, 35 secondary health facilities (33 state-run and 2 federal), 22 primary healthcare centers, seven military health institutions, and 72 NHIA-accredited private hospitals. Despite this broad distribution of facilities, healthcare access

remains inequitable, particularly for informal sector workers and rural communities.

The National Health Insurance Authority (NHIA), previously the National Health Insurance Scheme (NHIS), was established to promote universal health coverage and provide financial risk protection for all Nigerians. However, coverage remains heavily concentrated among formal sector employees due to payroll-based enrollment mechanisms. In contrast, informal sector uptake remains low, hindered by irregular incomes, poor awareness, and logistical barriers [17].

Study Design and Population

This was a cross-sectional comparative study involving NHIA-enrolled individuals who had accessed outpatient services at NHIA-accredited healthcare facilities in Kano State. Participants were drawn from all 44 LGAs and categorized into two groups: formal sector enrollees (government and private sector workers) and informal sector enrollees (self-employed individuals enrolled through programs such as GIFSHIP) [18].

Eligible participants were adults aged 18 years and above, who had been enrolled in NHIA for at least six months and had received care at a registered facility within the past three months. Only one respondent per household was selected to avoid intra-household duplication.

Sample Size Determination

The minimum sample size was determined using standard formulas for comparing two proportions, based on previously reported NHIA enrollment rates for formal and informal sector workers. With an alpha level of 0.05, a power of 80%, and a 10% adjustment for non-response, a total sample of 440 respondents was deemed sufficient to detect statistically significant differences between the two groups.

Ethical Approval

Ethical clearance was obtained from the Ethics Committee of Kano State Ministry of Health. Permission was obtained from the Kano State NHIA Office, the Hospital Management Board under which the State Hospitals are, and Aminu Kano Teaching Hospital. Clearance was also obtained from Texila American University. Written informed consent was secured from all participants after they received detailed information about the study objectives, procedures, risks, and confidentiality measures. Participation was voluntary, and participants were informed of their right to withdraw at any point without penalty.

Results

Socio-demographic Characteristics

A total of 440 NHIA enrollees participated in the study 205 from the formal sector and 235 from the informal sector. Among informal participants, 43.8% accessed services through private facilities, while only two received care at primary healthcare centers.

Most respondents were male (64.4% formal, 59.1% informal). The mean age differed significantly between groups: 39.5 years (±10.5) for formal and 43.4 years (±8.7) for informal enrollees ($p < 0.05$), with the majority in their 30s and 40s.

The ethnic profile was predominantly Hausa (64.9% formal, 51.4% informal; $p < 0.001$). The majority identified as Muslim (90.2% formal, 85.5% informal). A higher proportion of formal enrollees were married (79.0% vs. 72.0%; $p < 0.001$), while informal participants tended to have more children, with 33.6% reporting three and 25.5% reporting four ($p < 0.001$) as shown in “Table 1”.

Table 1. Socio-Demographic Characteristics of Respondents

Variable		Formal n (%)	Informal n (%)	$\chi 2$	p-value
Type of facility	Federal Tertiary	61(29.8)	61(25.9)	5.87	0.21
	State Tertiary	61(29.8)	61(25.9)		
	State Secondary	10(4.9)	10(4.3)		
	Private	71(34.6)	103(43.8)		
	PHC	2(0.9)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Gender	Male	132(64.4)	139(59.1)	1.27	0.28†
	Female	73(35.6)	96(40.9)		
	Total	205(100.0)	235(100.0)		
Age group (years)	18-24	14(6.8)	5(2.1)	37.52	<0.001*
	25-34	66(32.2)	31(13.2)		
	35-44	70(34.1)	104(44.3)		
	45-54	35(17.1)	77(32.8)		
	≥55	20(9.8)	18(7.7)		
	Total	205(100.0)	235(100.0)		
Ethnic group	Hausa	133(64.9)	130(51.4)	20.64	<0.001*
	Fulani	30(14.6)	61(36.0)		
	Yoruba	27(13.2)	31(13.2)		
	Igbo	3(1.5)	11(4.7)		
	Others	12(5.8)	2(0.9)		
	Total	205(100.0)	235(100.0)		
Religion	Islam	185(90.2)	201(85.5)	2.26	0.15†
	Christianity	20(9.8)	34(14.5)		
	Total	205(100.0)	235(100.0)		
Marital Status	Single	28(13.7)	26(11.1)	11.10	<0.001*
	Married	162(79.0)	169(72.0)		
	Divorced	11(4.4)	34(10.2)		
	Widow	4(2.0)	5(2.1)		
	Separated	0(0.0)	1(0.4)		
	Total	205(100.0)	235(100.0)		
No. of Children	None	36(17.6)	39(16.6)	23.30	<0.001*
	≤2	45(22.0)	33(14.0)		
	3	48(23.4)	79(33.6)		
	4	32(15.6)	60(25.5)		
	5	19(9.3)	14(6.0)		
	≥6	25(12.2)	10(4.3)		
	Total	205(100.0)	235(100.0)		

**= Significant at p<0.05*

†=Fisher exact test

Household and Employment Characteristics

Polygamous households were more common among informal enrollees (43.5% vs. 14.7%; p < 0.001). Most formal enrollees resided in urban areas (95.1%), whereas 17.9% of informal respondents lived in rural settings (p < 0.001).

Educational attainment was generally higher among formal participants, with 51.2% holding a diploma or bachelor's degree and 8.9% possessing postgraduate qualifications. Among informal workers, 69.8% held tertiary degrees, but only 3.4% had postgraduate education (p = 0.002).

More informal workers reported monthly earnings between ₦51,000 and ₦200,000 (71.9% vs. 46.8%), while 19.0% of formal enrollees earned less than ₦10,000, compared to just 4.7% of informal workers (p < 0.001).

Employment duration differed significantly: 41.3% of informal workers had been employed for 6–10 years, versus 25.4% of formal respondents (p < 0.001). The above data is represented in "Table 2".

Table 2. Socio-Demographic Characteristics of Respondents

Variable		Formal n (%)	Informal n (%)	$\chi 2$	p-value
Type of family	Polygamy	26(14.7)	91(43.5)	37.77	<0.001†
	Monogamy	151 (85.3)	118(56.5)		
	Total	177(100.0)	209(100.0)		
Place of Residence	Urban	195(95.1)	193(82.1)	17.74	<0.001†
	Rural	10(4.9)	42(17.9)		
	Total	205(100.0)	235(100.0)		
Level of Education	No formal	2(9.8)	2(0.9)	19.29	0.002*
	Primary	4(2.0)	2(0.9)		
	Secondary	52(25.4)	34(14.5)		
	Voc/Technical	24(11.7)	25(10.6)		
	Diploma/Bachelor	105(51.2)	164(69.8)		
	Postgraduate	18(8.9)	8(3.4)		
	Total	205(100.0)	235 (100.0)		
Income (Naira)	<10,000	39(19.0)	11(4.7)	38.82	<0.001*
	10,000-50,000	53(25.9)	37(15.7)		
	51,000-100,000	59(28.8)	88(37.4)		
	101,000-200,000	37(18.0)	81(34.5)		
	≥201,000	17(8.3)	18(7.7)		
	Total	205(100.0)	235(100.0)		
Duration employed (years)	<1	28(13.7)	12(5.1)	21.36	<0.001*
	1-5	65(31.7)	64(27.2)		
	6-10	52(25.4)	97(41.3)		
	11-15	31(15.1)	42(17.9)		
	≥16	29(14.1)	20(8.5)		
	Total	205(100.0)	235(100.0)		

**= Significant at p<0.05*

†=Fisher exact

Employment Type and Occupation

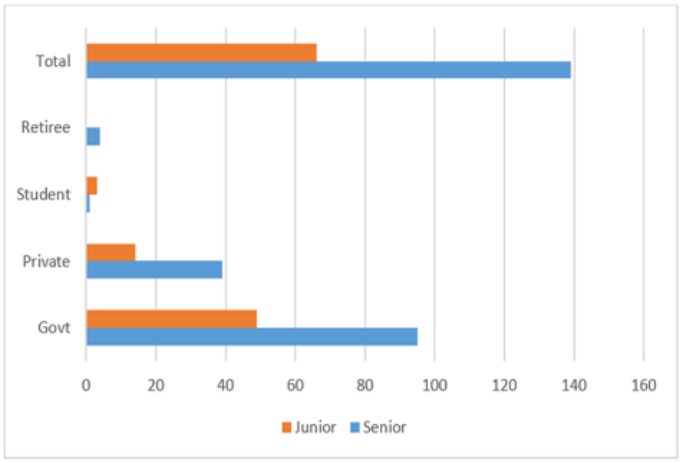

Figure 1. Level and Type of Employment of Formal sector Enrollees

The type and level of employment of the various enrollees is represented in "Figure 1". The majority of formal enrollees were government employees, either junior or senior staff.

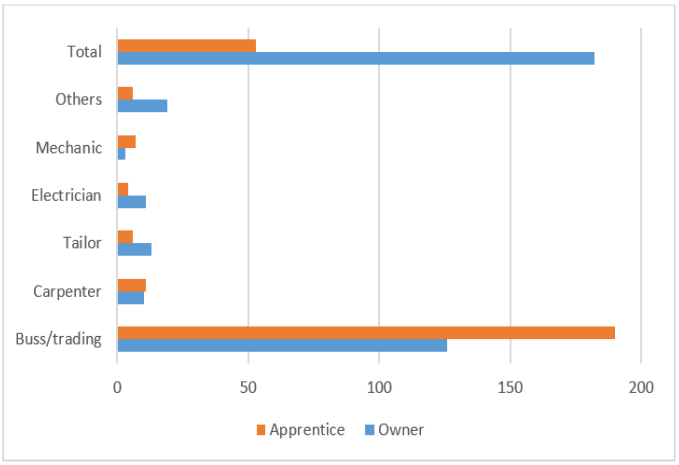

Figure 2. Occupation of the Informal Sector Enrollees

The occupation of informal enrollees is shown in "Figure 2" above. Informal enrollees were predominantly small-scale traders (53.6%), followed by artisans.

Awareness and Enrollment Patterns

"Table 3" shows awareness of NHIA was high across both groups, 87.3% in the formal sector and 83.0% in the informal sector. Employers were the main source of NHIA information for formal workers (52.2%), while informal participants primarily relied on friends or colleagues (50.6%) ($p < 0.001$).

Current enrollment was nearly universal, 98.5% of formal and 97.4% of informal respondents were active enrollees. However, principal enrollee status was more common in the informal group (83.8%) than the formal group (70.8%) ($p = 0.002$).

Table 3. Source of Information and Enrolment of Respondents

Variable		Formal n (%)	Informal n (%)	χ2	p-value
Source of information	Employer	107(52.2)	32(13.6)	121.50	0.00*
	Govt/public	61(29.8)	53(22.6)		
	Friends/colleague	23(11.2)	119(50.6)		
	HCP	5(2.4)	27(11.5)		
	Others	9(4.4)	4(1.7)		
	Total	205(100.0)	235(100.0)		
Awareness of NHIA	Yes	179(87.3)	195(83.0)	1.29	0.26
	No	26(12.7)	40(17.0)		
	Total	205(100.0)	235(100.0)		
Source of awareness	Employer	90(50.3)	25(12.8)	120.06	0.00*
	Govt/public	63(35.2)	42(21.5)		
	Friends/colleague	15(8.4)	107(54.9)		
	HCP	6(3.4)	20(10.3)		
	Others	5(2.8)	1(0.5)		
	Total	179	195		
Current enrolment	Yes	202(98.5)	229(97.4)	0.65	0.51†
	No	3(1.5)	6(2.6)		
	Total	205	235		
Status	Principal	143(70.8)	192(83.8)	10.56	0.002†
	Dependent	59(29.2)	37(16.2)		
	Total	202(100.0)	229(100.0)		

**=Significant at p<0.05*

†=Fisher exact test

Formal enrollers were more likely to register larger families, with 19.5% enrolling six or more dependents compared to 6.0% of informal respondents ($p < 0.001$). Informal enrollers generally enrolled only a spouse or small nuclear family.

Enrollment duration differed notably 27.6% of formal enrollees had been enrolled for seven or more years, compared to just 5.6% of informal enrollees ($p < 0.001$) as seen in "Table 4" below.

Table 4. Family Registered and Duration of Enrolment of Respondents

Variable		Formal n (%)	Informal n (%)	χ2	p-value
No. of family enrolled	Only 1	33(16.1)	38(16.2)	62.39	0.00*
	2	19(9.3)	68(28.9)		
	3	34(16.6)	71(30.2)		
	4	44(21.5)	28(11.9)		
	5	35(17.1)	16(6.8)		
	≥6	40(19.5)	14(6.0)		
	Total	205(100.0)	235(100.0)		

Family registered	Spouse only	38(18.5)	60(25.5)	91.85	0.00*
	2 spouses	12(5.9)	49(20.9)		
	2 spouses & 1child	21(10.2)	67(28.5)		
	2 spouses & 2child	48(23.4)	29(12.3)		
	2 spouses & 3child	45(22.0)	15(6.4)		
	2 spouses & 4child	36(17.6)	10(4.3)		
	1 spouse & 4child	4(2.0)	1(0.4)		
	Only me	1(0.5)	4(1.7)		
	Total	205(100.0)	235(100.0)		
Duration of enrolment (years)	<1	27(13.3)	24(10.3)	46.60	0.00*
	1-3	69(34.0)	133(57.8)		
	4-6	51(25.1)	62(26.7)		
	≥7	56(27.6)	13(5.6)		
	Total	203(100.0)	232(100.0)		

**=Significant at p<0.05*

†=Fisher exact test

Utilization and Motivation for NHIA Enrollment

Motivations for Enrollment and Continuation

Motivations differed by sector.

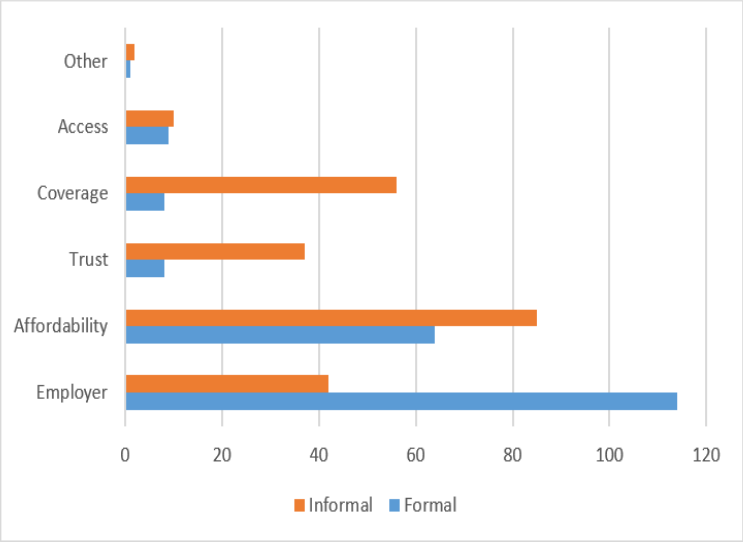

Figure 3. Motivations for Continuing Enrolment with NHIA

Formal respondents cited employer requirements as the primary reason for enrollment, while informal respondents prioritized affordability as displayed in "Figure 3". These trends persisted for continued enrollment.

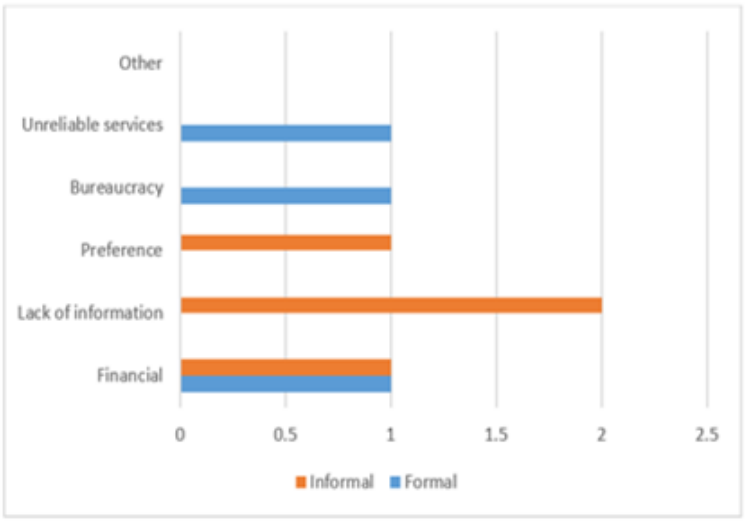

Figure 4. Reasons for Not Continuing Enrolment with NHIA

"Figure 4" displays some of the reasons why informal respondents stopped participation in the NHIA services. Lack of information was the main reason cited by informal respondents who discontinued participation.

Enrollment Continuity and Financial Satisfaction

Nearly all respondents indicated a desire to continue enrollment (98.5% formal vs. 98.3% informal; p = 1.00). However, formal sector respondents reported significantly higher satisfaction with pharmacy co-payments (81.4% vs. 31.1%; p < 0.001) and co-contribution arrangements (71.7% vs. 28.5%; p < 0.001). In contrast, informal participants were mostly neutral on financial indicators, with 67.2% to 73.2% expressing indifference.

More informal respondents reported high healthcare costs despite NHIA coverage (38.3% vs. 25.9%; p < 0.001). Interestingly, 66.8% of informal enrollees believed NHIA improved their health, compared to 36.1% in the formal group (p < 0.001) as seen in "Table 5" below.

Table 5. Assessment of Service Satisfaction as Motivators for Enrollment

Variable		Formal n (%)	Informal n (%)	$\chi 2$	p-value
Continue enroll	Yes	202(98.5)	231(98.3)	0.04	1.00†
	No	3(1.5)	4(1.7)		
	Total	205(100.0)	235(100.0)		
Pharmacy-co-payment	Very satisfied	23(11.2)	16(6.8)	134.93	0.00*
	Satisfied	144(70.2)	57(24.3)		
	Neutral	33(16.1)	158(67.2)		
	Dissatisfied	5(2.4)	4(1.7)		
	Very dissatisfied	0(0.0)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Co-contribution	Very satisfied	30(14.6)	20(8.5)	125.02	0.00*
	Satisfied	117(57.1)	47(20.0)		
	Neutral	37(18.0)	156(66.4)		
	Dissatisfied	15(7.3)	12(5.1)		
	Very dissatisfied	6(2.9)	0(0.0)		
	Total	205(100.0)	235(100.0)		

Deduction vs cost (before enrolment)	Very satisfied	20(9.8)	12(5.1)	96.52	0.00*
	Satisfied	119(58.0)	46(19.6)		
	Neutral	60(29.3)	172(73.2)		
	Dissatisfied	6(2.9)	4(1.7)		
	Very dissatisfied	0(0.0)	1(0.4)		
	Total	205(100.0)	235(100.0)		
Deduction vs cost (after enrolment)	Very satisfied	21(10.2)	16(6.8)	101.26	0.00*
	Satisfied	127(62.0)	50(21.3)		
	Neutral	53(25.9)	167(71.1)		
	Dissatisfied	4(2.0)	2(0.9)		
	Very dissatisfied	0(0.0)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Cost of health still high with NHIA	Yes	53(25.9)	90(38.3)	21.81	0.00*
	No	110(53.7)	130(55.3)		
	Same	42(20.5)	15(6.4)		
	Total	205(100.0)	235(100.0)		
Improve health With NHIA	Yes	74(36.1)	157(66.8)	47.71	0.00*
	No	20(9.8)	15(6.4)		
	Same	49(23.9)	31(13.2)		
	Not sure	53(25.9)	31(13.2)		
	Don't know	9(4.4)	1(0.4)		
	Total	205(100.0)	235(100.0)		

**=Significant at p<0.05*

†=Fisher exact test

Financial Satisfaction Summary

"Table 6" illustrates high satisfaction with financial components. Satisfaction with pharmacy co-payments exceeded 97% in both groups, with slightly higher satisfaction for co-contributions among informal participants (94.9% vs. 89.8%; p = 0.06).

Perceived value for money was high, over 97% of respondents in both groups agreed that their contributions were justified by the services received. Dissatisfaction remained below 3% for all financial measures.

Table 6. Rate of NHIA Service Satisfaction

Aspect of care	**Satisfaction status**	**Formal n (%)**	**Informal n (%)**	χ^2	**p-value**
Co-payment	Satisfied	200(97.6)	231(98.3)	0.04	0.84
	Dissatisfied	5(2.4)	4(1.7)		
Co-contribution	Satisfied	184(89.8)	223(94.9)	3.46	0.06
	Dissatisfied	21(10.2)	12(5.1)		
Deduct vs. cost B4	Satisfied	199(97.1)	230(97.9)	0.05	0.82
	Dissatisfied	6(2.9)	5(2.1)		
Deduct vs. cost after	Satisfied	201(98.0)	233(99.1)	0.34	0.56
	Dissatisfied	4(2.0)	2(0.9)		

**Statistically significant*

†=Fisher exact test

Satisfaction with NHIA Clinic Services

"Table 7" indicates high satisfaction with clinical services. Respondents across both sectors were satisfied with accessibility, cleanliness, staff availability, records management, medication supply, lab services, delivery care, staff attitude, and communication. There were no statistically significant differences between groups ($p > 0.05$), except for satisfaction with waiting times, where informal respondents reported higher satisfaction (94.0% vs. 82.9%; $p < 0.05$).

Table 7. Satisfaction with Quality of NHIA Clinic Services

Aspect of care	Satisfaction status	Formal n (%)	Informal n (%)	χ^2	p-value
Access@ clinic	Satisfied Dissatisfied	202(98.5) 3(1.5)	233(99.1) 2(0.9)	0.02	0.88
Cleanliness	Satisfied Dissatisfied	203(99.0) 2(1.0)	232(98.7) 3(1.3)	0.00	1.00
Availability of staff	Satisfied Dissatisfied	201(98.0) 4(2.0)	232(98.7) 3(1.3)	0.03	0.86
Records	Satisfied Dissatisfied	200(97.6) 5(2.4)	232(98.7) 3(1.3)	0.31	0.58
Medication	Satisfied Dissatisfied	192(93.7) 13(6.3)	224(95.3) 11(4.7)	0.31	0.58
Laboratory	Satisfied Dissatisfied	197(96.1) 8(3.9)	223(94.9) 12(5.1)	0.14	0.71
Delivery	Satisfied Dissatisfied	199(97.1) 6(2.9)	232(98.7) 3(1.3)	0.78	0.38
Waiting code	Satisfied Dissatisfied	170(82.9) 35(17.1)	221(94.0) 14(6.0)	12.6	0.00*
Waiting services	Satisfied Dissatisfied	197(96.1) 8(3.0)	227(96.6) 8(3.4)	0.00	0.98
Attitude	Satisfied Dissatisfied	198(96.6) 7(3.4)	232(98.7) 3(1.3)	1.39	0.24
Information	Satisfied Dissatisfied	200(97.6) 5(2 .4)	232(98.7) 3(1.3)	0.31	0.58

**Statistically significant*

†=Fisher exact test

General Satisfaction and Recommendations

Overall satisfaction and likelihood to recommend NHIA differed markedly by sector. Among formal respondents, 85.4% were satisfied or very satisfied, compared to only 25.6% in the informal group. Most informal participants (73.2%) remained neutral ($p < 0.001$).

Formal respondents were also more inclined to recommend NHIA: 80.0% were likely or very likely to do so, versus just 26.8% of informal respondents ($p < 0.001$) as shown in "Table 8".

Table 8. Overall Satisfaction and Recommendation for Enrolment with NHIA

Variable		Formal n (%)	Informal n (%)	χ2	p-value
Overall satisfaction	Very satisfied	68(33.2)	10(4.3)	174.28	0.00*
	Satisfied	107(52.2)	50(21.3)		
	Neutral	25(12.2)	172(73.2)		
	Dissatisfied	3(1.5)	3(1.3)		
	Very dissatisfied	2(1.0)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Recommend NHIA to others	Very likely	67(32.7)	7(3.0)	144.63	0.00*
	Likely	97(47.3)	56(23.8)		
	Neutral	35(17.1)	167(71.1)		
	Unlikely	5(2.4)	4(1.7)		
	Very unlikely	1(0.5)	1(0.4)		
	Total	205(100.0)	235(100.0)		

**Statistically significant*

†=Fisher exact test

Overall Satisfaction Summary

After collapsing the Likert scale to binary categories, both groups showed high satisfaction levels, 97.6% among formal sector and 98.7% among informal sector participants as in "Table 9". These findings affirm strong positive perceptions of NHIA services, despite differing underlying experiences.

Table 9. Overall Satisfaction Rate

Aspect of care	Satisfaction status	Formal n (%)	Informal n (%)	χ^2	p-value
Overall satisfaction	Satisfied Dissatisfied	200(97.6) 5(2.4)	232(98.7) 3(1.3)	0.31	0.58

Incentives to Encourage Informal Sector Enrollment

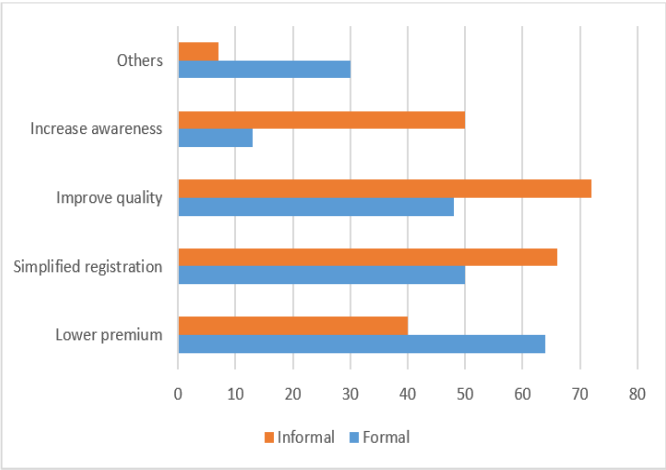

Figure 5. Types of Incentives to Encourage Informal Sector Enrollees

As shown in "Figure 5", informal respondents recommended improving healthcare quality (n = 120), simplifying the registration process (n = 116), and reducing premium costs (n = 104) as the most effective strategies to boost enrollment.

Qualitative Findings

NHIA Enrolment and Service Access

In-depth interviews with formal and informal sector participants revealed key themes around NHIA enrolment, sources of awareness, perceived benefits, service accessibility, quality, and adequacy. While many experiences were shared across groups, important distinctions emerged.

Awareness and Source of Information

Formal sector workers primarily learned about NHIA through their employers, describing enrolment as compulsory. In contrast, informal sector enrollees relied on social networks and personal initiative. Both groups noted some flexibility in choosing or changing healthcare facilities.

"It is my job that gave me the opportunity to know about it… my place of work placed me in it." (Formal)

"I heard about the benefits, so I enrolled." (Informal)

"You can choose any hospital and change it later if you are not okay with the services." (Formal)

Reasons for Enrolment and Perceived Benefits

For formal sector workers, enrolment was often mandatory. Informal participants joined voluntarily, citing financial benefits. Across both groups, NHIA was valued for its affordability and family coverage.

"Because of the benefits… it makes things a lot easier financially." (Informal)

"You have access to healthcare even when you have no money… tests are always free." (Formal)

"NHIA helps with my family's healthcare needs and eases the financial burden." (Informal)

Access to Healthcare Facilities

Proximity to accredited facilities shaped satisfaction. While some participants reported convenient access, others especially informal workers and mobile professionals, cited distance as a barrier.

"It's very close to my residence; I can go by foot." (Formal)

"Distance is a problem… my chosen facility is far." (Informal)

"We might wake up and be transferred elsewhere; distance is a concern." (Formal)

Perceived Service Quality and Equity

Participants generally perceived no discrimination between enrollees. NHIA units were often described as distinct, ensuring standardized care regardless of sector.

"Everyone is treated the same." (Informal)

"You can hardly differentiate between us." (Formal)

Facility Operating Hours

Most respondents found clinic hours satisfactory, though some mentioned limitations in service scope.

"Very good, you get attended to when you go." (Formal)

"Some services are not included; that needs correction." (Informal)

Satisfaction with NHIA and Retention

Participants' motivations for joining and continuing with NHIA centered on financial protection, trust in the system, and access to affordable care.

Financial Protection as a Key Motivator

Across sectors, the 10% co-payment model and coverage during health emergencies were frequently cited.

"Even when you don't have money, you can get care. You only pay 10%." (Formal)

"It helps financially, when my wife gave birth, NHIA saved me a lot of money." (Informal)

Family Coverage and Peer Influence

Family health needs and peer recommendations were especially important among informal sector participants.

"Because you often find someone sick in the family." (Informal)

"I tell my friends in business to join." (Informal)

Motivation to Continue

Participants reported continued enrolment due to reduced financial strain, trust in service quality, and timely care access.

"Immediately you feel unwell, you go to a healthcare center because you have insurance." (Formal)

"It has made things easier for me financially." (Informal)

"The system looks good to me; that's why I accepted it." (Informal)

Healthcare Providers' perspectives

Healthcare workers involved in NHIA implementation provided additional insights into operational realities, challenges, and areas for improvement.

Roles and Training

Providers described their roles in diagnosis, prescription, and referral. Most had received NHIA-specific training and adhered to treatment guidelines.

"I attend to patients by making diagnoses and giving prescriptions."

"We received training on emergency cases and the benefit package."

Service Coverage and Availability

Facilities generally offered outpatient, emergency, and maternity care under NHIA. Most essential drugs and lab services were available.

"Almost all services are covered, we try to make them available."

Service Integration and Referrals

NHIA services were usually offered in dedicated units, with referrals made when specialized care was needed.

"All in one unit, except for the lab."

"We refer to tertiary centers when services are unavailable."

Perceptions of Service Quality

Providers were largely positive about NHIA services but identified gaps in coverage and enrollee awareness.

"The services are very good and efficient."

"There's a need to increase awareness and expand service coverage."

Challenges in Service Delivery

Most providers did not report major operational challenges or sector-based discrimination but highlighted occasional patient-related issues.

"No difference between formal and informal sector patients… sometimes, attitude is an issue."

Discussion

This study examined uptake, utilization, and satisfaction with the National Health Insurance Authority (NHIA) among formal and informal sector enrollees in Kano State, Nigeria. The findings reveal both encouraging trends and persistent disparities in access, perceived value, and motivation for participation findings that mirror, yet also depart from, previous research across Nigeria and other LMICs.

Consistent with national patterns, formal sector participants in this study had greater NHIA awareness, longer enrollment durations, and higher rates of family coverage than their informal sector counterparts. These findings echo those of [19] and [20], who documented

structurally higher enrollment among salaried federal workers due to mandatory payroll deductions and institutional awareness campaigns. In contrast, informal sector enrollees primarily relied on peer/friends or family networks for information supporting earlier findings [21] and highlighting continued gaps in outreach to this group.

Notably, the current study observed near-universal self-reported enrollment and strong satisfaction across financial indicators in both groups, including pharmacy co-payments and perceived value for money. This contrasts with other studies [22-24], which found lower satisfaction due to drug stock outs and administrative inefficiencies. These improved satisfaction levels may reflect recent NHIA reforms aimed at standardizing service delivery and broadening the benefit package.

However, the observed neutrality and occasional dissatisfaction among informal sector enrollees regarding affordability even under the 10% co-payment model suggests that cost perceptions remain a barrier, as noted by [8]. Additionally, while informal respondents were more likely to believe that NHIA improved their health, they also more frequently cited persistent high out-of-pocket costs, a paradox seen in another study [6].

This study aimed to assess NHIA uptake, satisfaction, and sectorial disparities. The results affirm that while both groups report high overall satisfaction, their experiences diverge significantly. Formal sector participants, supported by employer mandates and structured payment systems, engage more comprehensively with NHIA registering more family members, enrolling earlier, and reporting higher satisfaction with financial procedures. Informal sector participants, despite high satisfaction in binary scoring, are more likely to report neutrality and face enrollment barriers such as limited awareness and cost sensitivity.

The strong agreement across groups on service quality including cleanliness, provider attitude, and communication suggests that clinic-level operations under NHIA may be more standardized than previously thought. However, informal sector enrollees expressed greater satisfaction with waiting times, potentially due to seeking care at private or lower-volume facilities, a phenomenon documented in other LMIC settings. This finding is in contrast to a study [25], where the highest proportion of Respondents expressed dissatisfaction with waiting time.

These findings have direct implications for UHC efforts in Nigeria. The current NHIA model remains disproportionately favorable to formal sector enrollees, undermining equity and financial protection for the majority of Nigeria's workforce. Tailored strategies are urgently needed to improve informal sector participation, including simplified registration, flexible payment options, and community-based outreach campaigns [26].

The high satisfaction with NHIA clinic services suggests that once enrolled, informal sector participants derive significant benefit which is a critical entry point for retention and advocacy. Investing in public trust through awareness campaigns, peer referrals, and streamlined access may enhance enrollment and utilization. Furthermore, leveraging community leaders and cooperative groups could bridge trust and information gaps for informal workers.

Several limitations must be acknowledged. First, selection bias may have influenced results, as the study relied on enrollees present at healthcare facilities, potentially excluding those who dropped out or never utilized services. Second, the cross-sectional design limits causal inferences regarding satisfaction drivers. Third, social desirability bias may have led respondents to overstate satisfaction or conceal dissatisfaction, particularly in face-to-face interviews.

Moreover, while the study attempted to control for key sociodemographic variables, unmeasured confounders such as chronic

illness burden, previous negative experiences, or provider behavior may have influenced satisfaction ratings. Finally, self-reported data on income and service utilization are vulnerable to recall bias and potential misclassification, especially among informal workers with variable earnings.

In conclusion, this study underscores persistent disparities in NHIA enrollment experiences between Nigeria's formal and informal sectors. While overall satisfaction with NHIA services is high, informal workers face unique challenges including limited awareness, shorter duration of enrollment, smaller family coverage, and perceived residual costs. Yet, their strong belief in NHIA's health benefits and willingness to recommend enrollment signal a critical opportunity for targeted policy reform.

To advance equitable universal health coverage (UHC) in Nigeria, the National Health Insurance Authority (NHIA) must prioritize the inclusion of the informal workforce through a multi-pronged strategy. This includes intensifying community-based awareness campaigns to increase understanding and trust in the scheme; simplifying and digitalizing the enrollment process to reduce administrative barriers; and introducing premium subsidies to ease financial burdens for low-income informal workers. Additionally, adopting more flexible co-payment arrangements can enhance affordability, while expanding the network of NHIA-accredited facilities particularly in underserved private and rural areas will help improve accessibility and service equity across population groups.

Conclusion

Future studies should adopt longitudinal designs to track satisfaction and dropout rates over time, while incorporating broader health system indicators. As Nigeria navigates health insurance reform under the NHIA Act, addressing informal sector disparities remains essential to achieving truly universal health coverage.

Conflict of Interest

There is no conflict of interest.

Acknowledgement

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References

[1]. Habib, S., Hamid, S., Khowaja, A., 2016, The role of micro health insurance in providing financial risk protection in developing countries- *A systematic review.*

[2]. Omotosho, O., Ichoku, H., 2016, Financial Protection and Universal Health Coverage. *International affairs and global health strategy.* (51) 5-14.

[3]. Flannery, D., Garvey, J., Inyang, U., 2020, The financial protection of national health insurance: Evidence from a cross section of State and Federal workers in Akwa Ibom, *Nigeria.*

[4]. Okunogbe, A., Hähnle, J., Rotimi, B. F., Akande, M., T., Wendy, J., Short and longer-term impacts of health insurance on catastrophic health expenditures in Kwara State, Nigeria. *BMC Health Services Research*.22 (1-18).

[5]. Amakom, U., Ezenekwe, U., 2012, Implications of households catastrophic out of pocket (OOP) healthcare spending in Nigeria. *Journal of Research in Economics and International Finance (JREIF)*

[6]. Aregbeshola, B. S., Khan, S. M., 2018, Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. *Int J Health Policy Manag.* 7(9):798–806. doi:10.15171/ijhpm.

[7]. Adewole, D. A., Osungbade, K. O., 2016, Nigeria's National Health Insurance Scheme: *A Highly Subsidized Health Care Program for a Privileged Few*

[8]. Aregbeshola, B. S., Khan, S. M., 2018, Predictors of enrolment in the National Health Insurance Scheme among women of reproductive age in Nigeria. *International Journal of Health Policy and Management.* 7(11), 1015-1023.

[9]. Onwujekwe, O., Onoka, C., Uzochukwu, B., Hanson, K., Constraints to universal coverage: Inequities in health service use and expenditures for different health conditions and providers. 10 (1-9).

[10]. Onoka, C. A., Onwujekwe, O. E., Uzochukwu, B., Uguru, N., Anochie, C., Ewelukwa O., 2012, Variations in Incidence Out of Pocket Spending for Illness amongst Households of Different Socio-Economic Groups: *An Investigation Using Expenditure Diaries.*

[11]. Omotosho, O., Ichoku, H. E., Distributional Analysis of Household Health Expenditure in Nigeria. *Developing country issues.* 9 (111-120).

[12]. Akinyemi, O. O., Owopetu, O. F., Agbejule, I. O., National health insurance scheme: perception and participation of federal civil servants in Ibadan.

[13]. Ibeneme, G. C., Ugochukwu, C., Nwosu, A.O., Fortwengel, G., Oko, C. C., Okpua, N., 2024, National Health Insurance Scheme Enrolees. Satisfaction with Quality of Care and Willingness to Retain Membership in a tertiary hospital in Nigeria: *Implications for Community-Based Health Insurance uptake.* 1-13.

[14]. Daramola, O. E., Adeniran, A., Akande, T. M., 2018, Patients' Satisfaction with the Quality of Services accessed under the National Health Insurance Scheme at a Tertiary Health Facility in FCT Abuja, Nigeria. *Journal of Community Medicine and Primary Health Care.* 30 (2) 90-97.

[15]. Osunde, N. R., Olorunfemi, O., Oduyemi, R. O., 2023, Awareness, willingness, and challenges of the informal sector toward state National Health Insurance Services in Benin City, Nigeria. *MGM J Med Sci.* (10)30-7.

[16]. Osahon, E., Achieving Universal Health Coverage in Nigeria: Moving Beyond Annual Celebrations to Concrete Address of the Challenges.

[17]. Bolarinwa, O. A., Afolayan, M. A., Rotimi, B. F., Alatishe-Mohammad, B., 2021, Are there evidence to support the informal sector's willingness to participate and pay for statewide health insurance scheme in Nigeria? *Niger Postgrad Med J.* 28(71-3).

[18]. Nwanaji-Enwerem, O., Bain, P., Marks, Z., Nwanaji-Enwerem, P., et.al., 2022, Patient satisfaction with the Nigerian National Health Insurance Scheme two decades since establishment: A systematic review and recommendations for improvement. *African Journal of Primary Health Care and Family Medicine.* 14 (1-10).

[19]. Onoka, C. A., Hanson, K., Hanefeld, J., Uzochukuwu, B. S., 2015, Towards universal coverage: *A policy analysis of the development of the National Health Insurance Scheme in Nigeria.* 30 (9) 1105- 1117.

[20]. Adewole, D. A., Adebayo, A. M., Udeh, E. I., Shaahu, V. N., Dairo, M. D., 2015, Payment for health care and perception of the national health insurance scheme in a rural area in Southwest Nigeria *American Journal of Tropical Medicine and Hygiene*. 93 (648-654).

[21]. Ebelechukwu, L. O., Chikosolu, Y. O., Chima, T. I., Clara, C. O., Chukwunweike, A. O., 2021, Health care payment practice, perception and awareness of national health insurance scheme by market women in Enugu Metropolis South-East Nigeria. 10.11604/pamj.2021.40.127.26775.

[22]. Olamuyiwa, T. E., Adeniji, F. O., 2021, Patient's Satisfaction with Quality of Care at a National Health Insurance Clinic at a Tertiary Center, South-South Nigeria. *J Patient Exp.*16; 8:2374373520981471. doi: 10.1177/2374373520981471. PMID: 34179352; PMCID: PMC8205399.

[23]. Uguru, N., Ogu, U., Uguru, C., et al., 2024, Is the national health insurance scheme a pathway to sustained access to medicines in Nigeria? *BMC Health Serv Res.* https://doi.org/10.1186/s12913-024-10827-1

[24]. Alawode, G., Adewole, A., 2021, Assessment of the design and implementation challenges of the National Health Insurance Scheme in Nigeria: a qualitative study among sub-national level actors, healthcare and insurance providers. *BMC Public health.* 21. 10.1186/s12889-020-10133-5

[25]. Iliyasu, Z., Abubakar, I. S., Abubakar, S., Lawan, U. M., & Gajida, A. U., 2010, Patients'

satisfaction with services obtained from Aminu Kano Teaching Hospital, Kano, Northern Nigeria. *Nigerian Journal of Clinical Practice.* 13(4), 371-378

[26]. Barasa, E. W., Mwaura, N., Rogo, K., and Andrawes, L., 2017, Extending voluntary health insurance to the informal sector: experiences and expectations of the informal sector in Kenya [version 1; referees: 3 approved] *Welcome Open Research* 2017, :94 (doi:2 10.12688/wellcomeopenres.12656.1

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Indian Bharatiya Janata Party (BJP) & Parliamentary Elections 2014-2024: Evaluating Strategies and the Gender Gap

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Abstract

This study analyses the ratio of male to female party candidates in India and how the Bharatiya Janata Party (BJP)'s strategies from 2014 to 2024 have marginalised women, making elections a crucial turning point. Scholars have shown that women often lose elections due to party decisions and strict criteria, reinforcing male dominance. Despite promises and women casting 67.40% of the votes, female politicians remain underrepresented: the Sabha parliamentary body comprises 469 elected men out of the 543 elected members, as determined by the First-Past-the-Post system. Since independence, the INC party and the BJP have focused on Hindutva ideology, promoting a male-dominated, Hindu cultural identity. Methodically, the study reviewed relevant literature, including the Election Commission of India, the Constitution, articles, BJP websites, and campaign reports, to evaluate the BJP's winning strategies and the "Seva" group's efforts to garner women's votes. It also examined literature on factors contributing to the gender gap, under the BJP's nomination patterns, which are often aligned with class-caste clusters, geographical, and religious divisions. While, India's deeply rooted male-dominated tradition has discouraged many women from pursuing careers in politics. The result portrays the BJP as India's most male-dominated ruling party, urging the government and political parties to promote women candidates and achieve the UN's goal of having one-third of all electoral positions allotted to women. It recommends establishing inclusive media platforms among women's elites to achieve electoral equality, adopting a bottom-up approach.

Keywords: *Election, Evaluation, Gender Gaps, Indian government, Male Dominance, Political Parties, Representation.*

Introduction

Elections worldwide focus on choosing passionate leaders who defend democratic principles, such as justice, human rights, societal well-being, security, freedom, balance of power, and equality, which are often at risk. Arguably, feminist philosophy promotes gender equality, affirming that everyone has the right to vote for whomever they choose and to pursue any role they desire. Furthermore, governance does not arise from an individual's lineage but from the collective effort of those dedicated to overcoming leadership challenges.

India, in South Asia, has over 1.3 billion people and is the world's largest democracy, according to the Royal Institute of International Affairs [1]. It is the seventh-largest country by land area and, as of June 2024, the most populous, surpassing China. Since its independence in 1947, India has become the largest constitutional democracy, adopting the Westminster parliamentary system, as many new states do. It reflects increasing political polarisation based on the British Westminster system, with over 2,000 parties competing locally and nationally. India's election system comprises the Head of State, the Prime Minister, and two legislatures: the 245-member Rajya Sabha and a 543-member lower house, which was elected via first-past-the-post in

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2019. The Gender Electoral Political Research Group's 2024 campaign in India noted a decline in the number of women candidates compared to men, mainly due to shifts in party mandates [2].

Sridharan [3] described India as a parliamentary secular republic in 2016, where the President serves as the Head of State and the top citizen, while the Prime Minister leads the government. India has a federal system with a central authority and states at the periphery. Since 1947, India's elections for these three federal structures have been dominated by males, with only one woman serving as Prime Minister and just two female senators. Achieving political equality is essential for creating a more inclusive and representative democracy. Sridharan traced the history of voting back to the early democracies (1828-1926), when voting rights were first given to males. Women faced numerous significant barriers in their fight for voting rights, which remained largely overlooked until suffrage movements emerged across various countries to support women's empowerment [4].

Milan's review of the IEC data report [5] showed that the right to vote and be voted for was protected in India under the universal adult franchise constitution, which helped ensure political equality for women and men at the time of India's independence in 1947. Constitutionally, Indian elections are held every five years. According to Milan, any political party that gets a majority of members in the lower house, referred to as the "Lok Sabha," or to the central government in Delhi, known as the "Vidhan Sabha," and a majority in the upper house called the "Rajya Sabha," is designated as the governing party or can establish a government.

The History of Elections

Hosken noted that women struggled for equal political rights, as Europe's legal status limited their autonomy [6]. Customs and decrees reduced women's rights, preventing single or widowed women from holding office to avoid marriage. Women's voting rights gradually expanded, and women campaigned for the right to vote.

Khaitan discussed Aristotle's research on nations that supported women's suffrage, starting with New Zealand in 1893—the first to grant women the right to vote nationally. Australia followed in 1902, with Nordic countries such as Finland (1906), Norway (1913), Denmark, and Iceland (1915) early in the 20th century. By the end of WWI, many countries endorsed women's suffrage, including the Netherlands (1917), Austria, Azerbaijan, Canada, Czechoslovakia, Georgia, Poland, and Sweden (1918). Greece (1952), Switzerland (1971), Portugal (1976), and microstates like San Marino (1959), Monaco (1962), Andorra (1970), and Liechtenstein (1984) later adopted suffrage [7].

Ute [8] recalled that women in Latin American countries gained voting rights in the early 20th century: Ecuador (1929), Brazil (1932), El Salvador (1939), Dominican Republic (1942), Guatemala (1956), and Argentina (1946). Women in Asian countries earned voting rights in the mid-20th century: Japan (1945), China (1947), Indonesia (1955), and India (1935). Women in Africa gained voting rights alongside men through universal suffrage in Liberia (1947), Uganda (1958), and Nigeria (1960). In the Middle East, universal suffrage was primarily acquired after World War II, with Kuwait extending suffrage to women in 2005 by a vote of 35-23.

Grandhi [9] described the electoral process in India from colonial times. The Indian National Congress, founded in 1885, was the first to contest elections. According to him, the process included direct elections for provincial legislatures and some central members. In 1950, India adopted its Constitution, granting universal adult franchise for citizens 18 and older. The first general election for the Lok Sabha took place in 1951-1952, with a voter turnout of over 17.3%. Gandhi mentioned that

the 1951 Representation of the People's Act set eligibility rules for parties and candidates. The Election Commission of India Act, 1951, defines the structure and functions of the Election Commission, as well as the roles of political parties.

Purpose of the Study

According to Kaushik, India's constitution and electoral process are designed as a federal system to promote equal voting rights and the freedom to participate. However, India's electoral trajectory still relies on a hidden caste system and culture, which continues to divide the population. India's constitution banned caste discrimination to ensure equal representation and introduced quotas as an alternative. This includes a proposed fairer allocation of representation for resource sharing in jobs and education, based on equity and justice rather than the caste system [10].

Jafar [11] observed that caste culture and its practices continue to exert a strong influence on the electoral process today, affecting appointments to positions, committees, and offices. Kofi [12] recalled that India's electoral process reveals ongoing gender inequality, with approximately 80% of candidates being male and only two women presidents — Sonia Gandhi and Droupadi Murmu — since independence. Also, Indira Gandhi was the only female party leader of the NCP, serving as Prime Minister twice; however, scholars note that even her rise to prominence was closely linked to her background and her father, Jawaharlal Nehru. Thus, generally, women's participation in ministerial, governorship, and legislative roles remains limited.

The Hindu culture and religious considerations also play significant roles in shaping male patriarchy towards electoral values. For more than a century, proponents of Hindu nationalism have pursued a redefinition of India as a Hindu homeland. Malhotra [13] observed that the government preferred the Hindu religion to describe Indians' right of independence. However, by 1947, the Independent National Congress Party (INC) leader, Mahatma Gandhi, was assassinated in the wake of 1948 after the struggle for India's independence from the colonial British. Therefore, this research aims to evaluate the BJP's gender election fairness and the gap. The study seeks to understand the complex dynamics driving elections and the representation gap in India's democracies with the following objectives.

1. To assess the BJP's methods for electoral victory
2. Investigate indicators for women or gender representation gaps
3. Identify the obstacles that deter women from winning or entering electoral politics
4. Recommend ways to advance women's participation in Indian politics

Praveen, a gender scholar, has argued that one way to ensure communities interact with community affairs through electoral democracy is through the Parliament [14]. However, the composition is exclusively male, despite women and men constituting nearly half of the country's population, and there are narrow differences in achieving its goals. In the governance process, experience has further shown that women's interests cannot be adequately addressed unless they comprise a significant number of the elected assemblies in any country.

Method

This section describes the researcher's method to obtain the necessary data and presents the results. This research adopted the descriptive approach. The descriptive approach systematically collects facts from secondary data sources. The researcher adopted this design because it will help to understand the gender representation imbalance in the Indian Bharatiya Janata Party (BJP) from different perspectives. Qualitative data were obtained from previous studies, existing literature, websites, ECI data publications, BJP data, and

other relevant sources. The realistic data were analysed systematically in a thematic format.

Descriptive Analysis

Electoral Commission India (ECI) Constitutional Criteria

According to Suhas [15] in the Political Weekly issue, the Election Commission of India (ECI), the principal electoral management body in India, oversees multi-party elections. It accredits national and state-level political parties in accordance with constitutional goals and electoral criteria. Typically, the country comprises 28 states, together with the union territories of Jammu and Kashmir, the national capital area of Delhi, and Puducherry. As of March 2024, Krutika reported six national parties and 57 state political parties; however, approximately 2,764 unrecognised parties remain.

A state party intending to establish itself and get recognition via the Electoral Commission of India (ECI) registration must comply with the following requirements: must choose a symbol from the available list of symbols offered by the ECI; must secure at least 6% of the valid votes polled in an election to the state legislative assembly and win at least two seats to be recognized as a party; secure at least 6% of the valid votes polled in an election to the Lok Sabha and win a minimum of one seat in the Lok Sabha; win at least 3% of the total number of seats or any fraction thereof allotted to that state; or secure 8% or more of the total valid votes polled in the state. At the national level, Krutika reviewed that a registered party is recognized as a national party only if it fulfills any one of the three conditions: the party should secure at least 2% of the seats (11 seats) in the Lok Sabha from at least three different states; at a general election to the Lok Sabha or the Legislative Assembly, a party must poll 6% of the votes in any four or more states, and in addition, it must secure at least four Lok Sabha seats; or the party must acquire credibility as a state party [16].

The Bharatiya Janata Party (BJP) Landscape

Scholars Suhas and Kofi have shown that the Bharatiya Janata Party (BJP), one of India's two major parties, was founded by Atal Bihari Vajpayee. Since 2014, it has been in power under the leadership of Prime Minister Narendra Modi. The BJP originated from the Janata Party, which held power for three years before uniting into the BJP. It aligns with right-wing ideologies and has ties to the “Rashtriya Swayamsevak Sangh” (RSS), a far-right paramilitary group that promotes a Hindu nationalist agenda. As of January 2024, the BJP is the largest party in India, controlling both Parliament and state legislatures.

Suhas [17] recalled that the BJP's ability to expand its support base beyond the upper castes has given the party notable momentum across all classes, including the middle class. Support for the BJP among Muslims stayed low, with only 8% of Muslim voters voting for the party. The party has often been described as right-wing throughout its history, but it has recently been labelled far-right. As of December 2023, the alliance manages 17 Indian states and union territories.

Kofi discussed the BJP's official ideology, [18] which is integral humanism, first introduced by Deendayal Upadhyaya in 1965. The party promotes social conservatism and a foreign policy focused on nationalist principles. During its initial period in national government, the BJP largely set aside its Hindu nationalist priorities and concentrated on a mainly liberal economic policy that emphasised globalisation and economic growth over social welfare.

In 2019, the BJP won the election with an increased majority. Soon after, on August 5, 2019, the Modi administration revoked Jammu and Kashmir's special status under Article 370, which had granted limited autonomy. In 2019, the Modi government passed the Citizenship (Amendment) Act, 2019, which amended the 1955 law to grant Indian citizenship to illegal immigrants of Hindu, Sikh, Buddhist, Jain,

Parsi, or Christian faith fleeing persecution from Pakistan, Bangladesh, or Afghanistan before December 2014. Muslims from those countries were excluded.

BJP's Winning Mechanisms and The Hindu Agenda

According to Kofi in 2019, the BJP increased its prominence, winning 37% of the popular votes and securing 303 parliamentary seats. Yet, the most critical challenge for the BJP is its inability to eliminate extreme poverty within a democracy defined. Sanjay [19] noted that most of the BJP's support originates from the most populous and typically poorer Hindi 'heartland', a strategy aimed at promoting its Hindutva agenda, as illustrated in Figure 1.

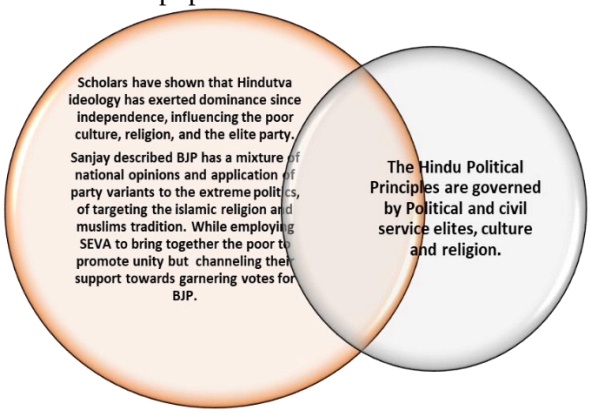

Figure 1. The Hindutva Ideology

Source: *Author's Framework Designed,2025.*

States in northern India, of Uttar Pradesh, Madhya Pradesh, and Bihar. Since taking power, Suhas recalled that the BJP has focused on the Hindu agenda. Hindu nationalists dismiss religions outside India, like Sikhism and Jainism, and are hostile toward Islam and Christianity. The BJP believes other parties interact with the minorities, especially Muslims, while they promote Hindu interests. Kashmir, India's only Muslim-majority state, was under lockdown from 2019 to 2021 with a communications blackout, its autonomous status revoked, and thousands detained. In Assam, where Muslims are about a third of the population and illegal immigration is a concern, detention camps hold those who cannot prove citizenship [19].

The Constitution Concepts of Election and Gender Neutrality

According to Kofi, the Delimitation Commission Act, 1956, established the delimitation of constituencies for elections to the Lok Sabha and state legislative assemblies. The Conduct of Elections Rules, 1961, prescribed rules and regulations for the conduct of elections in India. The Representation of the People (Amendment) Act, 1966, aimed to expand the scope of the Representation of the People Act, 1951, to make the electoral process more transparent and fair [20].

India's Election Laws, particularly the 1989 Amendment, resulted in modifications to the Representation of the People's Act, 1951, and the Conduct of Election Rules, 1961, ensuring free and fair elections. Since then, India has conducted regular local, state, and national elections. The Election Commission of India (ECI) has a similar mandate to Nigeria's INEC, organising fair elections. Recently, the ECI launched initiatives to empower all voters, including special booths for women and people with disabilities, transportation to remote areas, and voter awareness campaigns.

BJP and Women's Alliances

Sanjay's studies [21] on the BJP's ethical standards in shaping governance and policy

outcomes, as well as the party's policies from 2019 to 2024, highlight the BJP's moral commitment to accountability. Critics highlight several contradictions in the beliefs and practices related to promoting in the context of governing and re-election campaigns. He discussed the positive and negative effects of the BJP's policies on women, emphasising the party's inclusion initiatives, particularly the use of "SEVA" (women's selfless service scheme) as entry points accessible to everyone at the grassroots level to discuss people's welfare. According to Sanjay, the BJP (led by Modi) party explained that his efforts to focus on the welfare of the people helped him secure a 31% victory in the 2014 elections at the community level. The BJP won 282 seats in the Lok Sabha, securing an outright majority.

Results: Evidence of Gender Representation Gaps (GR-Gap) in 2014-2024

GR-Gap: Evidence of the BJP Male-Dynasty

Kumar [22] highlighted that women's loyalty to the BJP goes beyond voting preferences, rooted in Hindu values linked to Hindutva ideology. The BJP exploits women's lack of knowledge in voting, often surpassing the support levels of women in other parties. Recently, the BJP has intensified its efforts to mobilise female supporters, revealing a more pronounced gender bias than the women themselves.

Sanjay [23] cited the BJP 2024 party congress, which had 75% male executives and delegates from Gujarat, West Bengal, Telangana, Karnataka, Maharashtra, and Rajasthan. The Congress released a third list of 57 all-male candidates for the 2024 Lok Sabha elections on March 21, 2024. According to Sanjay, no female candidates appeared on the initial BJP list of 57 male candidates. Zoya reviewed [24] of the 2024 18th Lok Sabha and found that 69 women candidates — about 30 (9.8%) — won under the BJP. Seventy-four women (13.6%) were elected overall, down from 78 (14.4%) in 2019. Zoya [25] observed a sharp decline, with 62 female MPs (11.4%) among the 543 members of the 16th Lok Sabha. This was notably lower than the 15th Lok Sabha's 58 elected females (10.7%) in 2009, but higher than the 45 (8.3%) elected in 2004 and in 1991, and the 49 (9.4%) elected in 1996. Figure 2 explains the gender ratio in the Lower House and the Upper House (Senate).

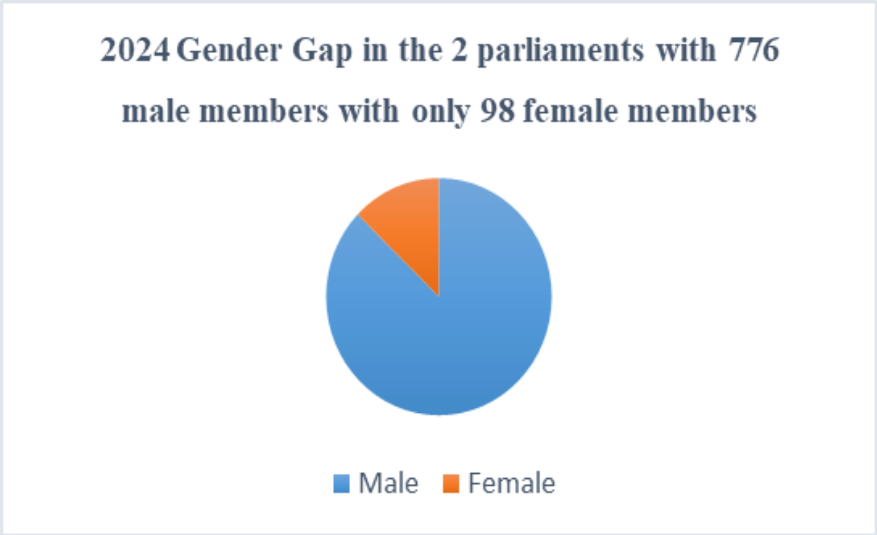

Figure 2. The 18th Lok Sabha (Lower House) and Rajya Sabha (Senate)

Source: *Author's Designed & Calculations from online data,2025*

This figure is lower than the target of 33% female representation set by the UN-Indian Gender Policy Review, which is expected to be reached, given the recent policy initiatives for the Indian Women's Reservation Bill proposed in 2023 and approved by parliament before the 2024 election [25]. Like other member states of the UN platform, the Indian government endorsed it to achieve a target of 35-50% women in public and private sectors since 1995.

GR-Gap: Areas of Female Representation Gap from 2014-2024

According to Dipanita, India has more than 2,000 political parties in the communities, yet women head none. Nonetheless, only six national parties are active, with just two, the Bharatiya Janata Party (BJP) and the Indian National Congress (INC), having fewer than 40% female candidates [26], as shown in Table 1, and in Figure 3 below.

Table 1. Number of Women Elected

Year	Position	Number of Women	Percentage
2024	Lok Sabha MPs	81 out of 542	15%
2024	Rajya Sabha	29 out of 237	12%
2020	Female Ministers	16	One in each constituency
2019	Rajya Sabha	33 out of 237	13.9%
2014	Lok Sabha	81 out of 524	14.9%
2014	Rajya Sabha	24 out of 237	10.1%
2018	Female Ministers	12	One in each state

Source: *Retrieved from online search: Election Commission India (ECI) website,2024*

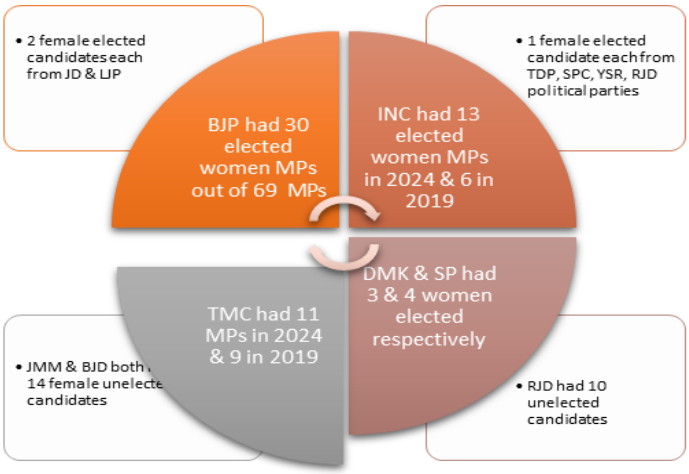

Figure 3. Women Candidates by Political Parties

Source: *Author's design from ECI, data online 2025*

GR-Gap: India Voting Behaviour and Gender Gap

The 1962 elections were the first for which voters' data were disaggregated by gender, with 47% of eligible women voting, in stark contrast to 63% of eligible men. Dayson [27] recalled that women's voting statistics did not align with the 47% representation shared in the voting register, unlike their male counterparts. For example, when women voted in the 1996 national elections, he observed that the ECI survey data showed that 86% of women followed their families' advice when making polling decisions. In the 2024 elections, the India National Statistical Organisation [28] reported that the INC fielded 41 women

candidates, of whom 13, or 34%, were elected. This is an improvement over the 2019 elections, when only 6 of 52 women candidates who contested for the Indian National Congress (INC) were elected.

GR-Gap: IPU Gender Gap Statistics

Advanced research and findings by the International Parliamentary Union (IPU) on women's representation in politics indicate that the Indian parliament, comprising the Lok Sabha and Rajya Sabha, currently has 102 women out of 664 members (as of 2024) [29]. IPU ranked India 146th ahead of Sri Lanka (182nd, 5%) and Japan (165th, 10%), but well behind Malaysia (142nd, 14.9%), Brazil (140th, 15%), Pakistan (106th, 20%), Indonesia (104th, 20%), Bangladesh (98th, 21%), Nepal (43rd, 33%), and South Africa (10th, 46%) among others. This includes Women appointed to political offices, as shown in Table 2, below.

Table 2. Women in Higher Political Offices

Political Party	Name	Dates	Office Elected /Appointed
Indian National Congress	Sonia Gandhi	2004-2009	Leader of the INC
Indian National Congress	Indira Gandhi	1966-1977	Prime Minister
Indian National Congress	Sarojini Naidu	1925/1936	1st female president of the Senate, First woman governor of Uttar Pradesh
BJP	Kiran Bedi	2014	Lieutenant Governor of Puducherry
Indian National Congress	Pratibha Patil	2007-2012	Former 12th Senate President of India
BJP	Droupadi Murmu	2022-date	Elected Senate president & former Governor of Jharkhand
BJP	Smriti Irani	2023	Information adviser
Opposition party	Mamata Banerjee	2022-2024	Chief Minister
BJP	Nirmala Sitharamani	2023-2024	Finance Minister

Source: *Retrieved from Secondary data cited online by ECI data report, 2019*

GR-Gap

The status of women MPs from 1957 to the present date is assigned as follows in Table 3 and Figure 4.

Table 3. The Women in Parliaments 1957-2024

Year of Election	Lok-Sabha Rep	Women MPs	Women %
2024	18th	74	13.7
2019	17th	78	14.4
2014	16th	62	11.4
2009	15th	45	11
2004	14th	40	10
1999/2000	13th	35	8.7

1994/5	12th	27	4.2
1990/91	11th	49	9
1982	6th	19	3.4
1977	5th	29	5.3
1972	4th	35	5.8
1967	3rd	31	5.6
1962	2nd	24	4.3
1957	1st	24	4.3

Source: *Retrieved online from Indian National Statistics (INS) 2024, Electoral Participation by Gender.*

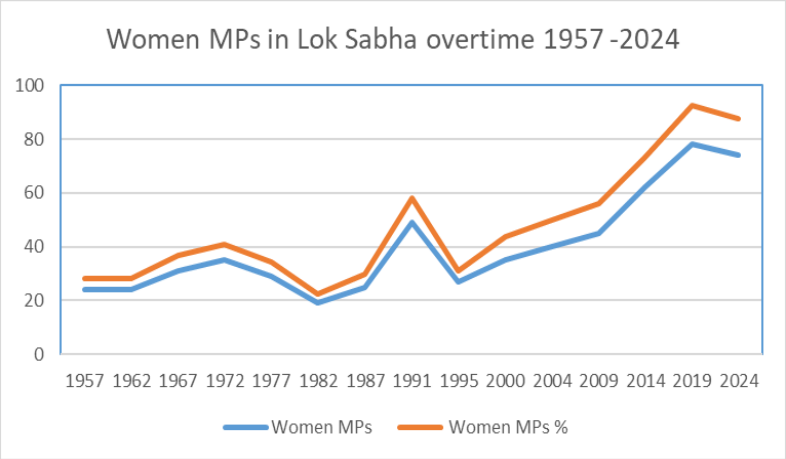

Figure 4. Women MPs 1957-2024

Source: *Author's Design & Calculations from online INS data.*

GR-Gap

The 10 National Political Parties and the Gender Gap in 2019& 2024, noted as follows in Table 4.

Table 4. National Political Parties and the Gender Gap in 2019 & 2024

The 10 National Political parties	**2019 Candidates**	**2024 Candidates**	**Women elected to the National Assembly**	**Women elected to the Rajya Sabha**
Bharatiya Janata Party (BJP)	56 (73.2%)	69 (43.4%)	30 (40.5%)	18
India National Congress (INC)	43	13	13 (17.6%)	4
Trinamool Congress (TMC)	-	40	11 (14.9%)	2
Jharkhand Mukti Morcha (JMM)	-	33	6	-
Biju Janata Dal (BJD)	-	33	3	-
Rashtriya Janata Dal (RJD)	-	29	3	-
Samajwadi Party (SP)	-	20	2	-
Telugu Desam Party	-	1	1	-
Lok Janshakti Party	-	2	1	-

Janata Dal United	-	2	1	-
Dravida Munnetra Kazhagam (DMK)	-	3	2	-
Total			**74**	**24 (98)**

Source: *Author's Calculations from online INS political parties' representation data*

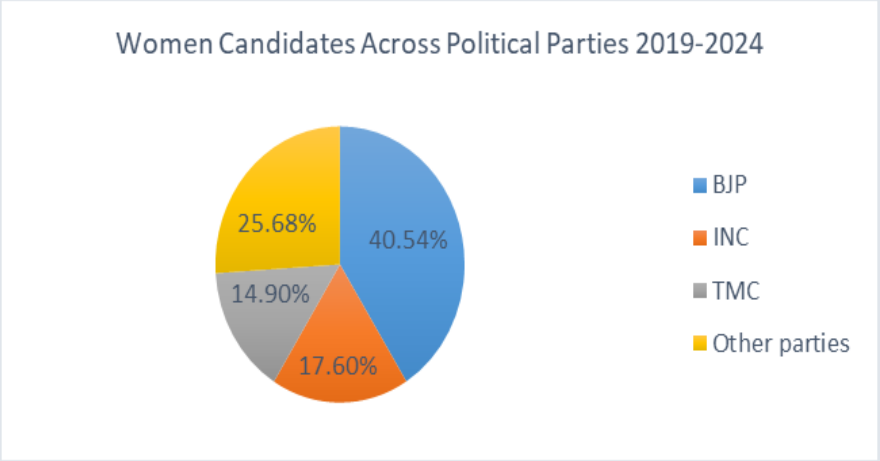

Figure 5. Women Candidates 2019-2024

Source: *Author's Design from online ECI website data on 2019-2024 elections.*

GR-Gap

In total, there are 668 men out of the 766 members in both parliaments (Lok Sabha: 542 and Rajya Sabha: 224), of which 24 are women in the Rajya Sabha (Upper House Representatives) and 74 are women in the Lok Sabha (Lower House of Representatives), as shown in Figure 6.

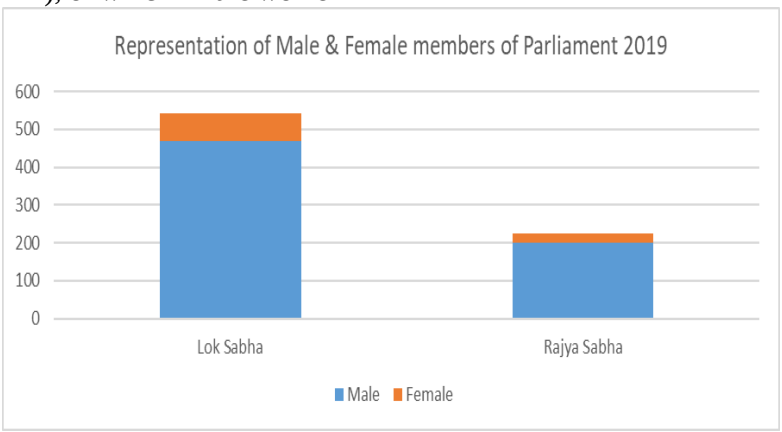

Figure 6. Representation of Male & Female Members of Parliament 2019

Source: *Author's design based on an online search of the 2019 election INS data.*

GR-Gap

Parihart recalled that in the 2014 general election, 61% of women voted; thus, historically, women's voter turnout has fluctuated in parallel with men's [30]. However, a convergence occurred in 2009, where women's participation increased even as men's decreased. Since then, women have exercised their right to vote in increasing numbers, with the gender gap largely vanishing in voting patterns in the 2019 general election, but remaining an impasse in the election data. Tables 5 and 7 below explain the historical trend.

Table 5. Historical Trend of Women Who Won Parliamentary Seats 1952-2019

Year	Total Number of Seats	Women Who Won	% of Total
1952	489	22	4.4
1957	494	27	5.4
1962	494	34	6.7
1967	523	31	5.9
1971	521	22	4.2
1977	544	19	3.4
1980	544	28	5.1
1984	544	44	8.1
1989	529	28	5.3
1991	509	36	7.0
1996	541	40	7.4
1998	545	44	8.0
1999	543	48	8.8
2004	543	45	8.1
2009	543	59	10.9
2014	543	61	11.2
2019	524	78	14.9

Source: *Retrieved online: Indian National Statistics (INS) 2024, Seats won by Women 1952-2019*

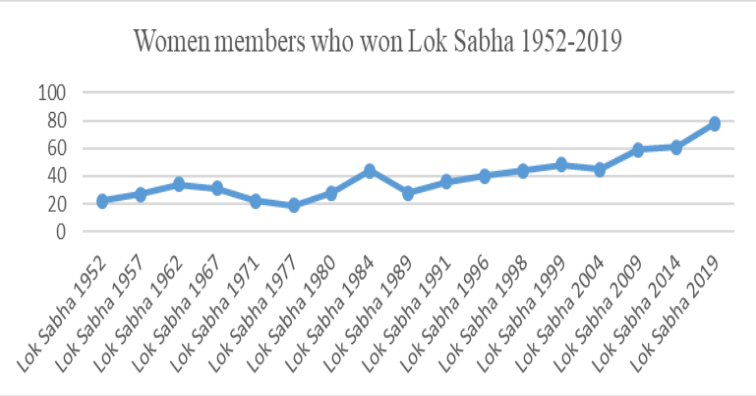

Figure 7. Women members who won in the Lok Sabha

Source: *Author's Search and Design: from online Lok data on elections,1952-2019.*

Discussion

Historically, women in India, such as those in Parihart [31], have faced significant political and legal restrictions that have limited their participation in various activities, raising concerns about the country's cultural practices and values. For instance, in the early days, women could not even apply natural, straightforward makeup like film actresses because Hindu law forbade it. Although this status quo has changed over the last three decades, the lasting impact of this shift is evident in the continued skewing of political participation away from women. According to Parihart, a critical obstacle is the widespread perception of politics as a murky agenda, which implies it is immoral for women who are unavoidably and culturally sensitive to the realities of night meetings, exaggerated manifestoes, party unholy alliances, among others, and being looked down upon by their community or friends as role models. Political

parties and male stakeholders exploit these realities to make politics and elections appear unsuitable for women. This perception is entrenched in all patriarchal societies, where women are often tasked with upholding family honour and social status. Consequently, patriarchal societies can quickly establish norms that incur reputational costs, prompting household heads to trace women's social or political behaviour. Some Indian Hindutva sees it as a moral ideal rooted in the concept of selfless service.

Factors Lowering Women's Participation

According to Ludden [32], evidence from the field and literature has shown that India's electoral politics, like those in many other countries, have been significantly corrupted by a lack of transparency and accountability during campaign funding, with widespread bribery used to secure votes or influence election outcomes to the party's advantage. Politicians are seen bribing their way through the same institutions that demand accountability; this has led to Indian elections being conducted by corrupt officials or politicians with a skewed disposition toward private and ethical business exchanges, and to the grooming of candidates through "clientelism" among the political elite. Ludden also recalled the consequences of corruption in India, as assessed by Transparency International's Corruption Perception Index, which ranked India 93rd out of 180 nations. He explained that 68% of male officials in India depend on money from government social welfare schemes while paying bribes to get elected, with the implications of engendering inequality, a lack of trust, a weakened economy, social division, and a poverty crisis.

Praveen's examination of the OFR (Observation Research Foundation) 2024 report on Indian constitutional and legal frameworks [33] reveals significant variations in how different countries approach gender equality in political representation. India's constitution includes specific protections for women's rights, as well as the 73rd and 74th Constitutional Amendments of 1993, which reserved one-third of seats in local governance institutions for women. Thirty years after its enactment, OFR observed that India has elected approximately 1.4 million women to regional offices and decision-making positions, establishing a foundation for women's political engagement that extends beyond tokenism. However, it is worth noting that similar quotas have not been extended to state and national legislatures, despite the passage of the Women's Reservation Bill in 2022 by the Bharatiya Janata Party (BJP); it remains unimplemented.

Other Obstacles Reviewed

This includes factors that have contributed to gender imbalance through corruption in Indian politics, as shown in Figure 8 below.

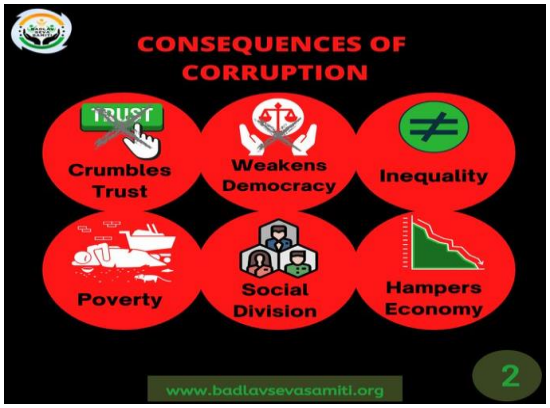

Figure 8. Consequences of Corruption

Source: *www.badlavsevasamiti.org.*

First, there are still decades of early marriage, high bride price traditions, and selective abortion, which have caused a significant imbalance between males and females. Second, Praveen recalled that the BJP's policies aimed at reducing India's 40% unemployment rate, which is higher in poorer northern states than in the more developed southern states. Third, culturally, southern India mainly supports the Hindu nationalist movement with Hindutva, which has lasted for a century. At independence, nationalists envisioned India as the homeland for South Asia's Hindus, similar to Pakistan for Muslims.

He observed that in exact arithmetic, the BJP provided one-to-one representation to wider parts of India, aligning women at the grassroots with the BJP's party values as a responsibility to humanity [33]. It capitalised on this support in the recent general election (2023-24) to establish a significant presence among women in key areas of Uttar Pradesh and Madhya Pradesh. Through this practice, Indian election observers found that the BJP received more votes from women than its opponents or other political parties. International observers reported that the BJP successfully mobilised women voters by 66%, if not more, in the 2019 election.

However, the main obstacles to lower women's representation are analysed in Table 6.

Table 6. Factors Lowering Female Representation

Political /Institutional Determinants	**Socio-Cultural & Religious Conditions**	**Economic determinants**
• The practice of caste-based division in Indian politics. The class system affects many victories and defeats. • Strict criteria set by political parties and the practice of zoning candidates out of the primary election diminish women's political confidence. • Lack of government reform on gender based bias, violence and constitutional rights lowers their interest in politics. • No support base formulae for gender balance in Nigeria.	• Lack of effective networking and media campaign for equal representation before each election. • Patriarchal practices and preference for males over females are • reinforced by women's reproductive roles: early marriage, pregnancy, childbirth, and parenting. • The influence of ethno-religion, early marriages, arranged marriages, and dowry practices reinforces restrictions on women	• Lack of campaign finances and sponsors. • Poverty among women hampers their political loyalty, from the bottom up, as their support goes to wealthier candidates. • Lack of women's voice at the governance level • The deficiency of party support committees in campaigning for women candidates.

Source: *www.ipu.org Carnegie International Observer Report on Indian elections 2019-2024.*

Anirvan [34] observed that women who identified with the BJP's political preferences showed strong signs of challenging other political parties in the Hindi heartland states, especially those organised along caste lines. The Seva strategy adopted by the Bharatiya Janata Party (BJP) in 2014 shifted the trend of cultural revivalism, aiming to reform the party system and caste dynamics, with a move toward 'mercantilist' economic ideologies.

Critical Assessment

The Carnegies' research on the 2019 Election [35] defines the popularly acclaimed Class of Caste (the poorest of the poor), a traditional definition of Indian communities and persons, which the BJP mobilises as a vertical cleavage in its strategy. Indian Prime Minister Narendra Modi's campaign in 2023 recognised this strategic method in his

campaign manifesto's policy, which he politicised to eliminate the traditional caste identities, where women constituted one of the "biggest caste" groups, along with youth and farmers.

There were also indications that the BJP employed a caste strategy to help grassroots women secure campaign support. In the 2022 state assembly elections, Bihar secured 99 of the 125 seats (77%) for BJP-led candidates, who won in constituencies where women's voter turnout exceeded men's. The BJP's grip among women was also noticeable in Uttar Pradesh, India's most populous state, as indicated by community-specific, gender-disaggregated data from exit polls conducted by Axis-MyIndia during the 2022 Legislative Assembly election.

The Indian Human Development Report [36] states that the BJP held interface meetings between women and men from upper- and lower-caste areas as part of a one-to-one campaign. Both have long created a core element of the BJP's support base among upper caste groups, Muslims, and Yadavs due to their Hindutva ideologies. Notably, among caste groups (swing voters) such as Jats, Kurmis, and non-Yadav as well as non-Jatav, referred to as Scheduled Castes (SCs), even among Jatav members of the Dalit community, who have long supported the Bahujan Samaj Party (SP), a versatile regional political front that has hitherto emerged as a response to upper-caste domination, are now with the ruling BJP.

According to Ivan Doherty [37], the BJP's strategy was focused on transforming women's active participation within Political Parties to match their numbers in elections. It recalled that the "BJP Hindu Women Reservation Bill," which was passed in the Lok Sabha in 2022, accelerated the BJP's seemingly paradoxical success in recruiting women and engaging them in the public sphere campaign. This gave the party advance influence over other parties that have not adopted the BJP Bill strategy. The reservation bill to increase the number of female seats is peculiar to the BJP alone. Political parties solicited women's votes from targeted "pro-women" advocates or stakeholders who mobilised them to vote.

Besides, the list of such mobilising programs and stakeholders or agencies is extensive. These include: Janata Dal (United)'s agency implementation of exclusions in the Bihar party; All India Trinamool Congress's Kanyashree party; Conditional Cash Transfer Program; JBP's Ladli Behna unconditional cash transfer (in Madhya Pradesh); and Ujjwala gas cylinder subsidies at the national level. These were among the programs, agencies, or stakeholders that followed up and engaged with women to garner their allegiance by voting for the party that attended to their welfare. Despite these initiatives from political parties, none of the strategies yielded a measurable increase that matched the rise in women's voting support for the BJP.

IEC Conference [38] notes India's first election in 1951 was won by the Indian National Congress (INC), which had 95% male members. Despite a non-Congress government in 1974, the male-dominated environment continued. Since 2014, the BJP has been the ruling party in India. The Election Commission of India (ECI), under the ruling government, shows the influence of incumbency. The BJP is often referred to as "the male succession affluence dynasty." Additionally, the growing political awareness of young women is now seen as a symbol of an informed society and a means to ensure their voices are heard and valued. It is essential to provide young women with the resources and support they need to take part in the electoral process, thereby promoting fair and inclusive representation.

Many policymakers and scholars have studied the importance of gender in Indian politics. Egwu notes the 2006 National Gender Policy supports a 35% affirmative action quota for women [39]. Articles 40 and 42(1), as well as Section 77(2), of India's Constitution prohibit discrimination on the basis of gender.

Despite these laws, women still face marginalisation in politics, especially during elections, even in democratic governments.

Omotoso points out that there is still much work to be done regarding issues of equity and equality, both locally and globally, when analysing transnational democracy from a feminist perspective [40]. She notes that many scholars have identified women's marginalisation across politics and society.

Recommendations

Based on the findings of this study, several recommendations emerge for advancing women's participation and performance in Indian politics:

1. The Indian government and political parties should urgently implement the Women's Reservation Bill, establishing actionable quotas with timelines and accountability, similar to local councils where women hold two-thirds of civil and political positions.
2. **Mandatory Gender Quotas within Political Parties**: All political parties should adopt mandatory internal quotas for women candidates, moving beyond the BJP's limited approach. These quotas should apply to candidate selection, party leadership positions, and campaign committees.
3. **Electoral Commission Oversight**: The Election Commission of India (IEC) should be empowered to monitor and enforce gender representation requirements. Parties failing to meet the minimum thresholds for women candidates should face penalties or risk losing recognition.
4. **Capacity Building Programs**: Regular training programs should be established for women interested in politics, covering political knowledge, campaign strategies, public speaking, and networking. These programs should be offered in various regional languages to ensure accessibility.
5. **Financial Support Mechanisms**: Special funding should be allocated for women candidates to address the financial barriers that prevent many women from entering politics. This could include campaign finance support, childcare provisions during campaigns, and security arrangements.
6. **Address Cultural and Social Barriers**: Community awareness programs should be launched to challenge patriarchal attitudes that view politics as unsuitable for women. These programs should engage religious and community leaders, families, and educational institutions.
7. **Media Representation**: Guidelines should be established for equitable media coverage of women candidates, moving beyond focusing on their appearance or family status to substantive coverage of their political platforms and achievements.
8. **Cross-Party Women's Caucuses**: Establishment of cross-party women's caucuses at national and state levels to collectively advocate for women's political participation and address common challenges faced by women politicians.
9. **Mentorship Programs**: Structured mentorship programs pairing experienced women politicians with newcomers to provide guidance, support, and networking opportunities.
10. Conduct regular gender audits of political parties and electoral processes to identify gaps and track progress in women's representation over time.

Conclusion

This study has demonstrated the persistent gender gaps in Indian parliamentary elections from 2014 to 2024, with a significant focus on the Bharatiya Janata Party (BJP). Despite women comprising approximately half of India's voting population and showing higher

voter turnout, their representation in Parliament remains abysmally low —less than 15%, far below the UN's recommended target of 33-50%.

The findings show India's democracy is incomplete without more women in governance. Women's MPS rose from 4.3% in 1957 to 13.7% in 2024, but gender parity remains distant without decisive action. UN Secretary-General António Guterres noted that gender equality is still 300 years away in many nations, despite progress in Rwanda, Canada, and the Netherlands.

The passage of the Women's Reservation Bill is positive, but it requires swift implementation with clear timelines and accountability. Parties should go beyond mere gestures to enact structural reforms that enable women's meaningful political participation. Growing political awareness among young women shows potential, but institutional reforms, cultural shifts, and sustained political will are needed individually and collectively to maintain these reforms.

This research compares two glove-fitting methods for both hands to effective governance, emphasising the need for balanced representation in politics. Achieving gender equality in India requires coordinated efforts from the government, individuals, civil society, and women's groups to address Access, Conscientisation, Action, and Equity (ACAE). Only with such unity can India realise its democratic potential and ensure women's voices influence decision-making.

Clarification on Ethical Approval, Data Availability & Author's Contribution

1. This article is NOT a field work product.
2. All data were sought from Secondary Data online, as explained in the pages for Abstract, Methods, and the data citations have been edited and added accordingly.

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Conflict of Interest

The researcher affirms the absence of any conflicts of interest in the investigation, examination, and dissemination of this article, as a Ph.D. student in the political science department at Texila University, this article is part of the requirements to obtain a Ph.D. degree; thus, the study has been performed with complete objectivity and ethical standards, and no monetary or non-monetary motives have impacted the outcomes, evaluations, or deductions discussed in this manuscript.

My dedication is exclusively towards attaining academic excellence and scientific accuracy while investigating the legitimacy of electoral processes and gender representation within the mentioned nations, as part of my educational requirements.

References

[1]. Royal Institute of International Affairs, 2022, India: The world's largest democracy. *London: Chatham House.*

[2]. Royal Institute of International Affairs, 2022, India: The world's largest democracy. *London: Chatham House.*

[3]. Sridharan, E., 2014, India's Constitutional Watershed Vote Report: Behind Modi's victory. *Journal of Democracy;* 25(4): 20-33.

[4]. Sridharan, E., 2014, India's Constitutional Watershed Vote Report: Behind Modi's victory. *Journal of Democracy;* 25(4): 20-33.

[5]. Milan, V., Smogard, D., 2014, A New Era in Indian Politics? Washington: *Carnegie Endowment for International Peace;* 2014.

[6]. Hosken, F., 1981, Women's Suffrage Movements: A global perspective. *American Historical Review.* 1981;86(3):515-532.

[7]. Khaitan, T., 2020, The Path to Women's Suffrage: International comparisons. *Oxford: Oxford University Press.*

[8]. Ute S., 2001, Women's suffrage in the Middle East. *Middle Eastern Studies*, 37(2), 234-251.

[9]. Gandhi, M., 2021, The Representation of People's Acts and Indian Democracy. *Political Studies India.* 19(2):156-178.

[10]. Kaushik, P., 2019, Caste, Constitution and Electoral Politics in India. *Indian Political Science Review*. 41(3):234-256.

[11]. Jafar, M., 2020, The Persistence of Caste in Indian Electoral Politics. *South Asian Politics.* 28(4):412-435.

[12]. Kofi, A., 2021, Religion and politics in Secular Democracies: India and the United States compared. *Comparative Politics.* 53(2):189-210.

[13]. Malhotra, I., 2019, The Assassination of Mahatma Gandhi and its Impact on Indian politics. *Historical Studies.* 87(4):567-589.

[14]. Praveen, K., 2024, Gender Representation in Indian parliament: A critical analysis. Indian J *Gender Studies.* 31(1):45-67.

[15]. Krutika, P., Saaliq, S., Rising, D., 2024, Modi claims victory in India's election, but drop in support forces him to rely on coalition partners. *AP News. India.*

[16]. Sanjay, K., 2020, Verdict 2019: The expanded support base of the Bharatiya Janata Party. *Asian Journal of Comp Polit.* 2020; 5(1):45-62.

[17]. Suhas, P., 2017, Hindu nationalism and Indian democracy. *Political Studies Review.* 2017;15(3):345-367.

[18]. Kofi, A., 2021, Electoral laws and delimitation in India. Indian Law Review, 45(2), 234-256.

[19]. Sanjay,2023, Comparative Electoral Systems Study., ECI and INEC: A comparative analysis. *Electoral Studies.* 78:112-128.

[20]. Sanjay, R., 2019, BJP's Ethical Standards and Governance, 2019-2024. *Indian Political Analysis.* 27(4):445-467.

[21]. Sanjay, K., 2015, The Modi Wave: BJP's 2014 Electoral Victory. *South Asian Politics.* 23(2):189-210.

[22]. Kumar, S., 2009, Women's loyalty and Hindutva ideology in BJP politics. *Gender Politics India.* 17(3):234-251.

[23]. Sanjay, R., 2015, Divided we govern: Coalition politics in India. *London: C Hurst & Co Publishers Ltd.*

[24]. Zoya, H. A., 2024, The Unified Opposition must take on the BJP in 2024: *The Wire News, June* 15, 2024.

[25]. UN-Indian Gender Policy Review, 2020, Placing the 2019 BJP victory in comparative and historical context. *India Review*. 2020;19(2):136-152.

[26]. Dipanita, M., 2021, Report on voter turnout across years in the Lok Sabha. *Ashoka University: Department of Political Science.*

[27]. Dyson, T. A., 2018, Population history of India: From the first modern people to the present day. *Oxford, Oxford University Press.*

[28]. Indian National Statistical Organisation, 2024, Electoral Participation by Gender, 2024. *New Delhi: Statistical Bureau Office.*

[29]. Inter-Parliamentary Union (IPU), 2021, Women's Representation in Politics: Global Rankings. *Geneva, IPU.*

[30]. Parihart, L. D., 2011, Women and politics in India: “Electoral Participation patterns”. *Electoral Studies India*. 29(3):345-367.

[31]. Parihart, L. D., 2021, Women and law: From impoverishment to empowerment. *Lucknow: Eastern Book Company.*

[32]. Ludden, D., 2013, India and South Asia: A Short History. *One World Publications.*

[33]. Praveen, K., 2024, BJP Seva strategy and women's mobilisation. *Indian Politics Today.* 42(3): PP, 234-251.

[34]. Anirvan, C., 2021, India in Modern Perspective. Cambridge: *Harvard University Centre for International Affairs.*

[35]. Carnegie International Observer Report, 2019, Indian elections: Gender dynamics. *Washington: Carnegie Endowment.*

[36]. Human Development Report, 2023, Global Gender Gap Report 2022-2023. *Geneva: UNDP*.

[37]. Doherty, I., 2004, Coalition of best practices. *Washington, DC: National Democratic Institute.*

[38]. IEC Conference Report in developing democracies. *Political Studies Quarterly*. 41(2):234-256.

[39]. Egwu, S., 2015, National gender policy and women's political participation. *Policy Studies India.* 33(4):399-415.

[40]. Omotoso, F., 2016, Transnational democracy and feminist perspectives. *Gender Politics International.* 24(3) pp,145-16.

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Investigate the Effects of Climate Change on the Agriculture Production of Kazumba Lulu Rural Communities: Cross-Sectional Study

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Abstract

Climate change represents significant challenges to agricultural production, food security, and livelihoods in rural Communities. This article investigates the effects of climate change on agricultural production in rural Communities and identifies effective adaptation strategies. The study provides insights into the perceptions, experiences, and adaptation strategies of rural Communities in the context of climate change. This study examines the impact of climate change on agricultural production in rural communities, with a focus on the adoption of multiple crop cultivation and adaptation strategies. A cross-sectional survey of 200 household heads of farmers reveals significant insights into the impacts of climate change and the adaptive measures employed by rural farmers. The results show that: - 84% of respondents perceive climate change as a significant threat to agricultural production. - Changes in rain availability affect 30% of respondents, while crop yields and water availability are impacted by 25% and 27.5%, respectively. Food security is also affected, with 17.5% of respondents reporting changes in their food security. - Crop diversification was the most common adaptation strategy (48%), followed by Climate-smart agriculture 5% and irrigation management (2%). 45% of respondents have limited access to climate information, and Insufficient resources. The findings of this study contribute to the existing body of knowledge on climate change and its impact on agriculture. The study provides recommendations for policymakers, practitioners, and researchers to support climate-resilient agriculture development in rural communities. The study's results have implications for food security, sustainable livelihoods, and poverty in rural communities.

Keywords: *Climate, Change, Agriculture, Production, Rural, Communities.*

Introduction

Climate change is a significant menace to agriculture in the world and especially in Africa, affecting crop production, food security, and the livelihoods of rural farmers. This article aims to review the evidence based on the impact of climate change on agricultural production in the Democratic Republic of Congo, particularly in Kazumba Lulu. Climate change is a burning global issue that affects the overall agricultural production, food security, and livelihoods in rural communities [1, 2]. The impact of climate change on agriculture is complicated, with outbreaks of temperatures, varying precipitation patterns, and elevated frequency of excessive weather events affecting crop production, water availability, and soil quality [3, 4]. In global rural communities, climate change can have destructive effects on livelihoods, particularly for smallholder community farmers who rely heavily on agriculture for their living and income [5]. Climate change can lead to reduced crop yields, lower incomes, and increased poverty, making it challenging for rural communities to achieve food security and sustainable livelihoods [6]. Several solutions exist to address the impact of climate change on agriculture: Practices like

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conservation agriculture and agroforestry can enhance soil health, improve water management, and increase crop yields [3, 4]. Potent irrigation systems can help community farmers optimize water use, reducing the impact of droughts and water scarcity [5]. Growing diverse crops can enhance farm resilience, improve food security, and increase farmers' incomes [6]. To address these challenges, climate-resilient agriculture practices, such as climate-smart agriculture, irrigation management, and crop diversification, can be effective adaptation strategies [7, 8]. Implementing climate-smart agriculture practices is a promising solution to address the impact of climate change on agriculture. These practices can help farmers adapt to changing weather patterns, improve crop yields, and enhance food security [7, 8]. However, the adoption of these practices requires access to climate information, financial resources, and technical support [9]. Rural communities often lack access to climate data, making it challenging to make informed decisions [9]. Limited financial resources restrict Rural Communities' ability to invest in climate-resilient practices [10]. This study aims to investigate the effects of climate change on agricultural production in rural communities and identify effective adaptation strategies. The study will provide insights into the perceptions, experiences, and adaptation strategies of rural communities in the context of climate change [10-15]. The study will also explore the impact of climate change on crop yields, water availability, and soil quality [16-20]. Additionally, the study will examine the role of climate-resilient agriculture practices in enhancing food security and sustainable livelihoods [21-25]. The findings of this study will contribute to the existing body of knowledge on climate change and agriculture [26-30]. The study will also provide recommendations for policymakers, practitioners, and researchers to support climate-resilient agriculture development in rural communities [31-35].

Objectives

This present study aims to investigate the effects of climate change on agricultural production in rural communities and identify effective adaptation strategies.

To provide a thorough examination of the effects of climate change on agricultural production in rural communities, focusing on multiple crop cultivation and adaptation strategies.

The Novel Contributions of the study are to provide quantitative evidence of the impacts of climate change on agricultural production in rural communities.

The study contributes to the limited body of knowledge on climate change and agriculture in the Kazumba Lulu rural area, providing valuable insights for policymakers and practitioners. The study's findings provide valuable insights for policymakers and practitioners seeking to support climate-resilient agriculture development in rural communities, specifically in Kazumba Lulu.

Materials and Methods

1. Description of the Site

Kazumba Lulu is located in Songa Rural Health Zone (ZS), territory of Kamina, Haut-Lomami province in the Democratic Republic of Congo. The relief is characterized by a mountain range on the clayey-sandy soil. The climate is tropical with two alternating seasons: a dry season from mid-April to mid-August, and a rainy season from mid-August to mid-April. The vegetation is dominated by grassy savannah and forest in some places. The community is accessible by road and rail, which connects it to the town of Kamina at about 150 km away. The accessibility by road and rail is difficult due to the very advanced state of disrepair of the national road and the rails, which date from the colonial era, which consequently hurts the income of the

population. The majority of the population lives thanks to agriculture, small livestock, small trade, hunting, artisanal fishing, and some seasonal activities (mushroom picking and the collection of caterpillars and winged ants, etc.). The community has a lean season of 3 months from September to November. And food becomes scarce as a result of the preparatory work of the fields, the abundant rains, and the sowing, which makes the markets more unstable and already causes an increase in the price of this food product, which is the staple food. Households have less access to this food and become more food insecure, with the risk of developing malnutrition [36].

2. **Description of the experiment**.

This cross-sectional study design is designed to capture detailed information on climate change perceptions, agricultural production, and adaptation strategies, with a sample size of 200 rural community participants.

3. Description of statistical methods

The Study Population: A Descriptive statistic for categorical variables was carried out in the Kazumba Lulu Rural Farmers Community, where the questionnaire was conducted following the target population for the study in the Kazumba Lulu community.

4. Sampling Method

The probability sampling approach is recommended and used here to ensure representativeness and reduce bias. We used the Random sampling method to select the 200 respondents for the present study, so that every farmer has an equal chance of being selected from a complete list of farmers.

5. Data Collection

A validated and standardized questionnaire was used for data gathering, and interviews were carried out by the researcher and the interviewers to collect information on hard copy (paper) and electronic (smartphone).

The Types of Interviews were structured and standardized to enable the ten interviewers to ask each respondent the same questions in the same manner. All questions were set in advance, with the possible choice of answers.

The interviewers observed closely the interview directives, and the responses were noted or written down. Only interview those participants who fit the sampling criteria, in such a way that a limited range of responses is extracted.

6. Data Analysis

To analyze our data from the 200 samples, we used the frequency counts from our questionnaire and calculated the percentages. Using Excel, the results were presented in tables and figures (bar charts). The Frequency counts report the number of occurrences of each category or response in our data collection. Percentages convert these frequencies into proportions of the total sample, making it easier to interpret and compare. Tables and figures in this study complement each other by highlighting different features of the data collected.

Results

The results of the present study are presented in percentages from the table to the charts. Here we are presenting the table results from tables one to five.

Out of 200 respondents who participated actively in the study questionnaire, here are the observations and findings collected from the study:

Table 1 and Figure 1 enumerate the Demographic characteristics of respondents by sex: Male 60%; Female 40%; and by age: 18-24 years 15%; 25-34 years 25%; 35-44 years 30%; 45-54 years 20%; 55+ Years 10%.

Out of 200 participants, these are the observations and findings of the research study represented in tables and figures.

Table 1 enumerates the demographic information of the sample. Males accounted for

60 % of the respondents, females 40%, 18-24 years 15%, 25-34 years 25%, 35-44 years 30%, 45-54 years 20%, 55+ years 10%. The most common age ranges from 25-34 and 35-44, accounting for 55%.

Table 1. Demographic Characteristics of Respondents

Variables	Characteristic	Frequency	Percentage
Sex	Male	120/200	60%
	Female	80/200	40%
Age	18-24 years	30/200	15%
	25-34 years	50/200	25%
	35-44 years	60/200	30%
	45-54 years	40/200	20%
	55+ years	20/200	10%

Note: *Categories under demographic characteristics: gender and age range. -Frequencies represent the number of respondents in each category. - Percentages are calculated from the total sample size (N=200).*

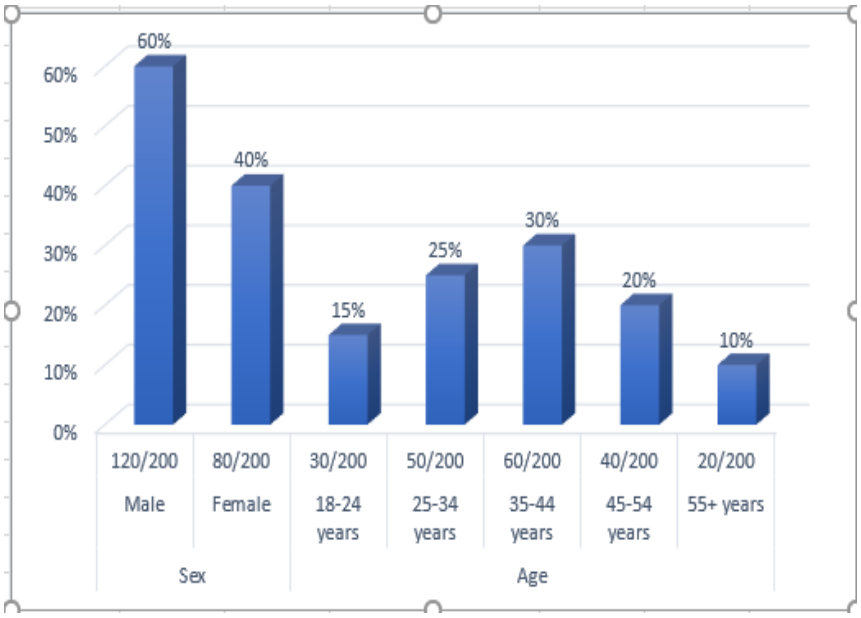

Figure 1. Demographic Characteristics of Respondents

Note: *This figure displays the demographic distribution of respondents (N = 200). The sample consisted of 60% males and 40% females. Age groups were distributed as follows:18-24 years (15%), 25-34 years (25%), 35-44 years (30%), 45-54 years (20%), and 55+ years (10%). The combined age groups 25-34 and 35-44 represent the majority at 55%.*

Table 2 and Figure 2 list the Climate Change Perceptions of respondents: Aware of climate change 42.5%; Not aware of climate change 7.5%, and respondents who believe climate change affects agriculture 41.5%, and do not believe climate change affects agriculture 6%.

Table 2 lists the Climate Change Perceptions of respondents: aware of climate change (42.5%), not aware of climate change (7.5%), and those who believe climate change affects agriculture (41.5%), as well as those who do not believe climate change affects agriculture (6%).

Table 2. The Climate Change Perceptions

Variables	Characteristic	Frequency	Percentage
Awareness of Climate Change	Aware of climate change	85/200	42.5%
	Not aware of climate change	15/200	7.5%
Belief that Climate Change Affects Agriculture	Believe climate change affects agriculture	83/200	41.5%
	Do not believe climate change affects agriculture	12/200	6%

Note: *Climate Change Perceptions Categories: awareness& recognition of climate change. -Frequencies represents the perception of respondents in each category. - Percentages are calculated from the total sample size (N=200).*

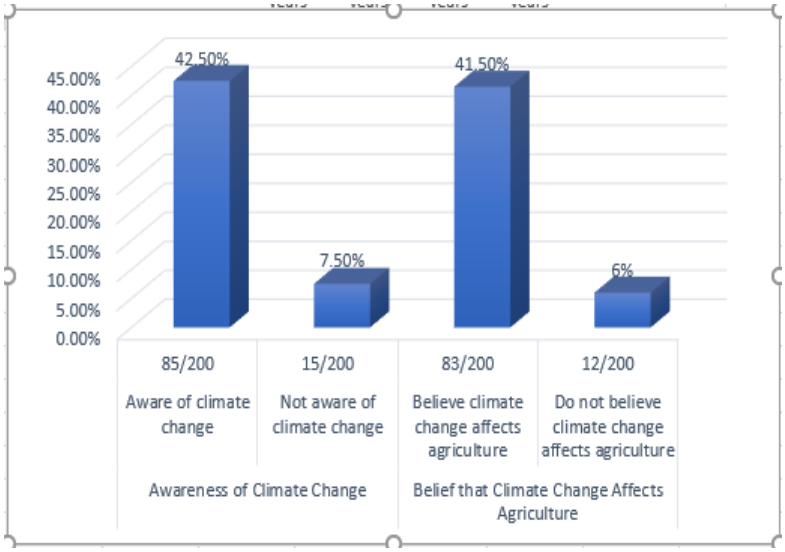

Figure 2. The Climate Change Perceptions

Note: *This figure illustrates respondents' awareness and beliefs regarding climate change (N = 200). Forty-two-point-five percent (42.5%) of respondents are aware of climate change, while 7.5% are not. Additionally, 41.5% believe that climate change affects agriculture, whereas 6% do not.*

Table 3 and Figure 3 list Climate change impact on respondents: Impact on rain availability 30%, Impact on crop yields 25%, Impact on water availability 27.5%, Impact on food security 17.5%.

Table 3 lists the Climate change impact on respondents' observations: Impact on rain availability 30%, Impact on crop yields 50%, Impact on water availability 27.5%, Impact on food security 17.5 %.

Table 3. Climate Change Impact

Variables	Characteristic	Frequency	Percentage
Perceived Impact on Rain Availability	Impact on rain availability	60/200	30%
Perceived Impact on crop yields	Impact on crop yields	50/200	25%
Perceived Impact on Water Availability	Impact on water availability	55/200	27.5%
Perceived Impact on Food Security	Impact on food security	35/200	17.5%

Note: *Climate Change Impact Categories: rain, crop, water, food. -Frequencies represent the influence of climate in each category. - Percentages are calculated from the total sample size (N=200) of acceptance*

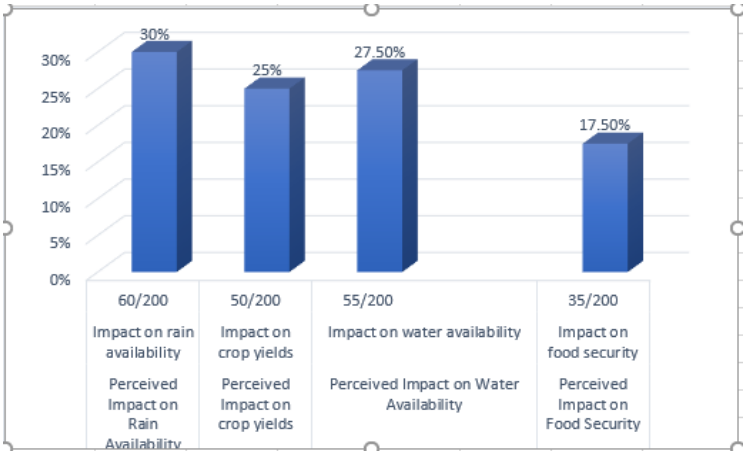

Figure 3. Climate Change Impact

Note: *This figure illustrates respondents' observations of climate change impacts (N = 160). The impacts include rain availability (30%), crop yields (50%), water availability (27.5%), and food security (17.5%).*

Table 4 and Figure 4 list the Agricultural Production of respondents cultivating Cassava 25%, Groundnuts 25%, Maize 25%, Beans 16%, Potatoes 5%, Rice 2%, and soybeans 2%.

Table 4 lists the Agricultural Production of respondents, who cultivate Cassava (25%), Groundnuts (25%), Maize (25%), Beans (16%), Potatoes (5%), Rice (2%), and Soybeans (2%).

Table 4. Agricultural Production

Variables	Characteristic	Frequency	Percentage
Crop Types Cultivated	Cassava	50/200	25%
	Groundnuts	50/200	25%
	Maize	50/200	25%
	Beans	32/200	16%
	Potatoes	10/200	5%
	Rice	4/200	2%
	Soybeans	4/200	2%

Note: *Agriculture Production Categories: types of crops cultivated. -Frequencies represent the production of respondents in each category. - Percentages are calculated from the total sample size (N=200).*

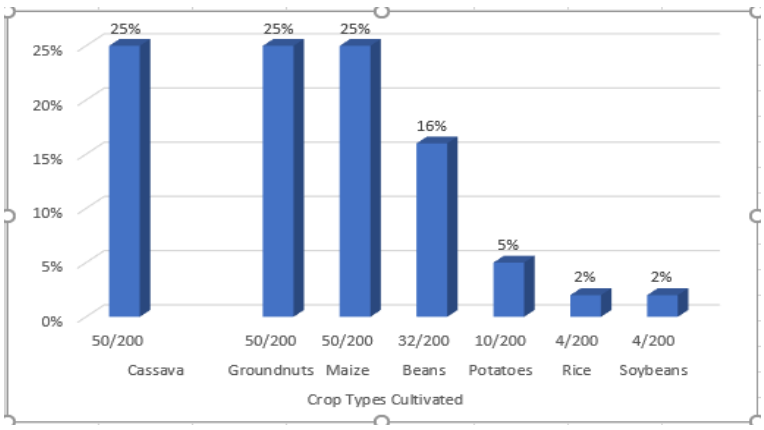

Figure 4. Agricultural Production

Note: *This figure illustrates the types of crops cultivated by respondents (N = 160). Cassava, groundnuts, and maize each account for 25% of cultivation, followed by beans at 16%, potatoes at 5%, and rice and soybeans each at 2%.*

Table 5 and Figure 5 list the agriculture practices of respondents: not receiving climate information, 25%; not using necessary resources, 25%; and respondents practicing Climate-smart agriculture, 5%; Crop diversification, 48%; and Irrigation management, 2%.

Table 5 lists the Adaptation Strategies of respondents: not receiving climate information, 25%, not using necessary resources 25%, and respondents practicing Climate-smart agriculture 5%, Crop diversification 48%, and Irrigation management 2%.

Table 5. Agriculture Practices

Variables	Characteristic	Frequency	Percentage
Reception of Climate Information	not receiving climate information*	50/200	25%
Use of Necessary Resources for Adaptation	not using necessary resources**	40/200	20%
Practice of Climate-Smart Agriculture	Climate-smart agriculture	10/200	5%
Practice of Crop Diversification	Crop diversification	96/200	48%
Practice of Irrigation Management	Irrigation management	4/200	2%

Note: *Agriculture Production Categories: crop type practice. -*Frequencies represent the updated status of respondents. -**Frequencies represent the equipment status of respondents. Frequencies represent the strategies of respondents in each category. Percentages are calculated from the total sample size (N=200).*

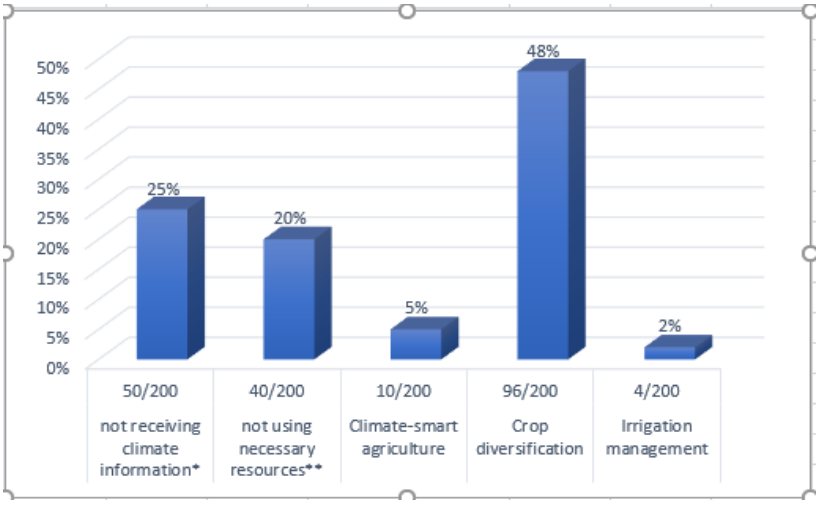

Figure 5. Agriculture Practices

Note: *This figure presents the adaptation strategies related to climate change among respondents (N = 160). Twenty-five percent (25%) of respondents reported not receiving climate information, and 25% reported not using necessary resources. Among those adopting strategies, 48% practice crop diversification, 5% engage in climate-smart agriculture, and 2% use irrigation management.*

Discussion

The discussion of the study has been done according to the objectives of the study, to investigate the effects of climate change on agricultural production in rural communities, focusing on multiple crop cultivation and

adaptation strategies. Out of 200 respondents to the study questionnaire:

Table 1 and Figure 1 represent the Demographic characteristics of respondents (Sex and Age): Male 60%, Female 40%, 18-24 years 15%, 25-34 years 25%, 35-44 years 30%, 45-54 years 20%, 55+ years 10%. All the sexes and ages are represented, males 60% and ages from 25-34 to 35-44 years, 55% representing the highest respondents.

Table 2 and Figure 2 represent the percentage of respondents' awareness and belief of Climate Change Perceptions: Aware of climate change, 42.5%; Not aware of climate change, 7.5%; Believe climate change affects agriculture, 41.5%; Do not believe climate change affects agriculture, 6%. 42.5% of respondents are aware of climate change, and 41.5% believe climate change affects agriculture, representing the highest percentage.

Table 3 and Figure 3 enumerate the percentage of respondents testifying on the Climate change impact: Impact on rain availability, 30%; Impact on crop yields, 50%; Impact on water availability, 27.5%; Impact on food security, 17.5%. 100% of respondents attest to the impact on rain availability.

Table 4 and Figure 4 list the percentage of respondents practicing multiple agricultural production: Cassava 25%, Groundnuts 25 %, Maize 25%, Beans 16%, Potatoes 5%, Rice 2%, Soybeans 2%. 80% of respondents commonly cultivate cassava, groundnuts, and Maize.

Table 5 and Figure 5 list the percentage of rural farmers' Adaptation Strategies, information, and knowledge: not receiving climate information, 25%; not using necessary resources, 25%; Climate-smart agriculture, 5%; Crop diversification, 48%; and Irrigation management, 2%. It is showing that 100% of respondents are not receiving climate information and necessary resources.

The use of climate-smart agriculture practices, irrigation management, and crop diversification helps farmers adapt to climate change. The impacts of climate change on agriculture and food security are significant. These impacts can lead to reduced agricultural productivity, increased food insecurity, and decreased livelihood opportunities.

The study reveals that the majority of respondents (75%) cultivate multiple products (Figure 4), with cassava, groundnuts, and maize being the most common combination. Changes in rain availability affect 30% of respondents, while crop yields and water availability are impacted by 25% and 27.5%, respectively (Figure 3). This finding suggests that farmers in the study area are diversifying their crops to reduce the risks associated with climate change.

Conclusion

The study provides insight into the effects of climate change on agricultural production in rural communities and identifies effective adaptation strategies. The study concludes that the cultivation of multiple products, particularly cassava, groundnuts, and maize, is a common practice among farmers in the study area. This practice can provide several benefits, including improved food security, increased income, and enhanced resilience to climate change.

To support farmers in the study area, it is recommended to provide farmers with accurate and timely climate information to inform their decision-making.

Provide rural farmers with access to necessary resources, such as fertilizers, pesticides, and irrigation systems, to optimize their timely crop production.

Provide rural farmers with training and capacity-building programs to enhance their knowledge and skills in crop production and management.

Source of Information

Questionnaire 2025.

Ethical Approval

Informed consent was obtained from study participants, and approval was obtained from

the head office of the rural community farmers' network 0203042025.

Conflict of Interest

There is no conflict of interest tied to this article.

References

[1]. IPCC, 2013, Climate change 2013: The physical science basis. *Cambridge University Press.* https://doi.org/10.1017/CBO9781107415324

[2]. Lobell, D. B., & Burke, M. B., 2010, Atlas of US climate change impacts. *Environmental Defense Fund*. https://doi.org/10.1016/j.agrformet.2010.07.008

[3]. Schlenker, W., & Roberts, M. J., 2009, Nonlinear temperature effects indicate severe damages to US crop yields under climate change. *Proceedings of the National Academy of Sciences*, 106(37), 15594-15598. https://doi.org/10.1073/pnas.0906865106

[4]. Thornton, P. K., & Herrero, M., 2015, Climate change and livestock systems. *Agricultural Systems*, 137, 1-12. https://doi.org/10.1016/j.agsy.2015.03.006

[5]. Altieri, M. A., & Koohafkan, P., 2008, Enduring farms: Climate change, smallholders and traditional farming communities. *Food and Agriculture Organization of the United Nations.* ISBN: 978-983-2729-55-6

[6]. FAO, 2017, The future of food and agriculture: Trends and challenges. *Food and Agriculture Organization of the United Nations.* ISBN 978-92-5-109551-5

[7]. IFAD, 2014, The impact of climate change on rural poverty. *International Fund for Agricultural Development.* https://ioe.ifad.org/documents/d/new-ifad.org/climate-change-building-smallholder-resilience_e-pdf

[8]. World Bank, 2015, Climate-smart agriculture: A call to action. *World Bank Group.* http://documents.worldbank.org/curated/en/992021468197391264

[9]. Ahmed, S., & Stepp, J. R., 2013, Climate change and food security in rural communities. *Journal of Food Security*, 5(2), 1-12. https://doi.org/10.12691/jfs-5-2-1

[10]. Bhattacharya, S., & Das, S., 2015, Climate change and its impact on agriculture in India. *Journal of Agricultural Economics*, 66(2), 1-12. DOI: https://doi.org/10.1111/1477-9552.12083

[11]. Kumar, P., & Singh, R. K., 2014, Climate-resilient agriculture in rural India. *Agricultural Systems*, 127, 1-12. DOI: https://doi.org/10.1016/j.agsy.2014.03.004

[12]. Mandal, S., & Bhattacharya, S., 2015, Climate change and its impact on rural livelihoods. *Journal of Rural Development*, 34(2), 1-12. https://doi.org/10.25175/jrd/2015/v34/i2/71845

[13]. Singh, R. K., & Singh, A. K., 2015, Climate-resilient agriculture in rural India. *Journal of Agricultural Science*, 153(2), 1-12. https://doi.org/10.1017/S0021859614000714

[14]. CGIAR, 2015, Climate-smart agriculture: A research report. CGIAR Research Program on Climate Change, *Agriculture and Food Security.* https://www.cgiar.org/research/program-platform/climate-change-agriculture-and-food-security/

[15]. FAO, 2015, The impact of climate change on agriculture. *Food and Agriculture Organization of the United Nations*. https://www.fao.org/geospatial/our-work/what-we-do/climate-change-impact-on-agriculture-production/en/

[16]. Lobell, D. B., & Gourdji, S. M., 2015, Climate change and food security. *Environmental Research Letters*, 10(10), 1-12. https://doi.org/10.1088/1748-9326/10/10/104003

[17]. Schlenker, W., & Roberts, M. J., 2009, Nonlinear temperature effects indicate severe damages to US crop yields under climate change.

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Proceedings of the National Academy of Sciences, 106(37), 15594-15598. https://doi.org/10.1073/pnas.0906865106

[18]. Thornton, P. K., & Herrero, M., 2015, Climate change and livestock systems. *Agricultural Systems*, 137, 1-12. DOI: 10.1016/j.agsy.2015.03.006.

[19]. Altieri, M. A., & Nicholls, C. I., 2013, Climate change and smallholder farmers. https://doi.org/10.1007/s10584-013-0909-y

[20]. IFAD, 2015, Climate-smart agriculture: A policy brief. *International Fund for Agricultural Development*. ISBN 978-92-9072-282-3.

[21]. Kurukulasuriya, Pradeep H.; Rosenthal, Shane J., *Climate change and agriculture: a review of impacts and adaptations (English).* Environment department papers; no. 91. *Climate change series, Washington, DC; World Bank*. http://documents.worldbank.org/curated/en/757601468332407727

[22]. Ahmed, S., & Stepp, J. R., 2013, Climate change and food security in rural communities. *Journal of Food Security*, 5(2), 1-12. https://doi.org/10.12952/journal.elementa.000092

[23]. Bhattacharya, S., & Das, S., 2015, Climate change and its impact on agriculture in India. *Journal of Agricultural Economics*, 66(2), 1-12. DOI: 10.1111/1477-9552.12083

[24]. Kumar, P., & Singh, R. K., 2014, Climate-resilient agriculture in rural India. *Agricultural Systems*, 127, 1-12. https://doi.org/10.1016/j.agsy.2014.03.004

[25]. Mandal, S., & Bhattacharya, S., 2015, Climate change and its impact on rural livelihoods. *Journal of Rural Development*, 34(2), 1-12. DOI: 10.25175/jrd/2015/v34/i2/71845

[26]. IPCC, 2014, Climate change, Impacts, vulnerability, and adaptation. *Cambridge University Press*. DOI: 10.1017/CBO9781107415379

[27]. Lobell, D. B., & Burke, M. B., 2010, Atlas of US climate change impacts. *Environmental Defense Fund*. doi: 10.1016/j.agrformet.2010.07.008

[28]. Prajapati, Harshad & Yadav, Khushboo & Hanamasagar, Yamuna & Kumar, Margam & Khan, Tanzeel & Belagalla, Ningaraj & Thomas, Vimala & Jabeen, Afshan & G., Gomadhi & Malathi, G., 2024, Impact of Climate Change on Global Agriculture: Challenges and Adaptation. *International Journal of Environment and Climate Change*. 14. 372-379. 10.9734/ijecc/2024/v14i44123.

[29]. Reuters, 2015, Climate change and food security. https://www.reuters.com/article/business/environment/over-consumption-climate-change-threaten-food-security-water-supply-fao-idUSKBN0N522W/

[30]. The Guardian, 2015, Climate change and agriculture. https://www.theguardian.com/environment/2022/nov/03/big-agriculture-climate-crisis-cop27

[31]. The New York Times, 2015, Climate change and food security https://www.nytimes.com/by/Christopher-flavelle

[32]. USDA, 2015, Climate change and agriculture. https://www.ers.usda.gov/amber-waves/2015/November/climate-change-water-scarcity-and-adaptation

[33]. European Commission, 2015, Climate change and agriculture. https://commission.europa.eu/publications/annual-activity-report-2015_en#details

[34]. Paris Agreement, 2015, Article 2. https://unfccc.int/files/meetings/paris_nov2015/application/PDF/paris_agreement_english_pdf

[35]. United Nations Framework Convention on Climate Change, 1992, Article 2. https://unfccc.int/resource/docs/convkp/conveng.pdf

[36]. Kazumba Lulu Community Farmers' Network Source, 2024.

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Experiences and Perceptions of Parents toward Health Care Delivery at Neonatal Intensive Care Unit in Tamale Government Hospitals: A Qualitative Inquiry

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Abstract

Neonatal Intensive Care Unit admission is usually unexpected and can be stressful to the parents causing strenuous psychosocial effects. Parents of infants admitted to the Neonatal Intensive Care Units often reported suffering stress, depression, and feelings of powerlessness. This study explored the experiences of parents on health care delivery at Neonatal Intensive Care Units. A qualitative study was conducted using phenomenology design and data were collected from nine mothers taking care of their infants at the Neonatal Intensive Care Units of two government hospitals in Tamale. Face-to-face in-dept interviews were conducted employing a semi-structured interview guide. The interviews were audio taped, and thematic analysis was performed to analyse the interview transcripts. Three themes were generated from data analysis and organized in line with the theoretical framework adopted in this study. Although participants are willing to cooperate in the health care delivery system, many of them are not comfortable with the behaviour of some staffs in the facilities. The study found that logistics to render health care was woefully inadequate. Inadequate environmental hygiene, a lack of privacy, inadequate health education, and poor communication between patients and parents have all contributed to some patients' negative health care experiences. Hospital management and concerned bodies should consciously and deliberately take efforts to provide the logistics and structural appropriation to improve health care delivery at the Neonatal Intensive Care Units.

Keywords: *Experiences and Perceptions, Health Care Delivery, Neonatal Intensive Care, Parents of Neonates,*

Introduction

According to [1], the neonatal phase has been defined as the first 28 days of life, and it stands for the moment when a child's chances of surviving are the lowest. Globally 2.4 million children died in the first month of life in 2020 [2]. Sub-Saharan Africa has the highest neonatal mortality rate in the world (27 deaths per 1000 live births) with 43% of global newborn deaths, followed by central and southern Asia (23 deaths per 1000 livebirths), with 36% of global newborn deaths [3]. Msemo et al., (2013) reported that about four (4) million deaths of children occur within the first 28days of life each year accounting for 40% of under-five (5) mortalities, and the majority (about 3/4) of these deaths happen during the first week of life [4]. Adding that, a vast majority occurs in south Asia and sub-Saharan Africa. The highest death rate in neonates and infants occurs in Africa, yet there is little data on the experiences of parents during admission for care at health centres [5]. In 2020, neonatal mortality rate for Ghana was 22.9 deaths per 1000 live births. Neonatal mortality rate of Ghana declining at a moderating rate from 26.0 deaths per 1000 live

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births in 2015 to 22.9 deaths per 1000 live births in 2020 [6].

The neonatal period is the critical stage of the life of children. It is the time they adjust physically to the external environment outside the mother's body. In utero, the baby functions from the mother. When a baby leaves the womb, its body systems must begin working on their own. Some neonates have trouble making the transition outside the womb including, preterm birth, a difficult birth leading to severe birth asphyxia, and birth defects. But a lot of special care is available to help new-born babies.

A neonatal intensive care unit (NICU) admission is usually unexpected and can be stressful to the parents causing strenuous psychosocial effects. Parents of infants admitted to the NICU often reported suffering stress, depression, and feelings of powerlessness [7]. Rihan et al., 2021 conducted a study in Jordan, which reported that all mothers and fathers expressed feelings such as shock, anxiety, and worry when they were informed about their neonate's admission to the NICU. Parents of infants in the NICU must address multiple challenges including handling their premature babies, dealing with people and medical staff in the NICU, and handling their own relationships [8]. Parents' appetite and sleep patterns were also affected [9]. It is common for parents to have disrupted lifestyles at home due to stressful conditions. Studies found changes such as skipping days at work for the sake of finding peace or having time for visits to the NICU [10]. Additionally, parents' relationships as spouses were affected as mothers felt isolated from their husbands [10]. But generally, parents were supportive of each other [10].

Several studies were conducted to examine the impact of the healthcare team in providing support. Heidari et al., (2017) concluded that offering information to parents and engaging them in decision-making regarding their infant, helped in alleviating the anxiety of most parents [11]. This was supported by Kelleher et al., (2022), who did an interventional study and found that most fathers changed their feelings towards the admission of their neonates to the NICU after the education and the information they received [12]. Additionally, parents' trust in the medical staff has increased when they were provided with knowledge about their baby's condition [13].

By sharing knowledge, participating in care, and combining technical know-how with family-centred nursing care interventions promote the best possible father-infant bonds through engagement create meaningful fathering moments [14]. According to Hynan, (2005) and Johnson, (2008), getting a picture of dad cuddling with his baby is one way to support the parents in creating memories of their stay in the NICU [15]. The first time holding or bathing, the first time feeding or changing diapers, the first interacting smile, or any other memorable occasion can all be considered fathering moments [14, 16]. According to Johnson, (2008), the objectives of nursing care include aggressively removing barricades for the newborn in the NICU, promoting parental competence with practical, effective parenting techniques, and encouraging a collaboration in the baby's care.

Parental stress related to NICU admissions is a worldwide health care issue. According to the American academy of paediatrics [17], nearly 5% of all newborns require an intensive care unit to stay and another (15-20%) of all newborns require special services. Admission of babies into the neonatal intensive care unit is displeasing to parents of these babies most often. Parents go through symptoms of stress, anxiety and other post-traumatic experience even after discharge from the unit [11]. Even with a short stay in this unit, parents are bound to experience these symptoms which call for more family support.

From experimental survey conducted, it was observed that, most of neonatal intensive care units in Ghana lack facilities that allow parents

to have continuous contact with their babies on admission [18, 19]. Babies are kept under the supervision of nurses and doctors, without much involvement of parents.

A focus group discussion organized by Torab, et al., (2017) in their qualitative research showed that, most participants acknowledged that babies experience discomfort, and several mentioned signs that babies may exhibit, including crying or facial expressions changed during treatments [20]. Instruments such as heart rate monitors and breathing rate drops can be used to quantify pain. Along with temperature, respiration, pulse, pressure, and pulse, pain is regarded as the fifth vital sign. Since babies cannot express their pain, nurses must be cautious and skilled in managing it. Doctors also stress how important pain is for babies because it can agitate and stress them out.

Most parents see admissions of their babies at the health centres as the most difficult treatment-related decisions they face during illness because of moral, cultural and religious basis. Research from the parent's perspective of the quality of care rendered to children during admission is scarce in the Tamale metropolis. Therefore, this study will be conducted to explore the experiences and perceptions of parents on healthcare delivery at the neonatal intensive care units and provide information in this regard. This information will help nurses to develop interventions that promote family-centred care and supportive care. Understanding parental needs and experiences will also allow for the development of meaningful family-centred care strategies in the NICU. These strategies are key to improving the outcomes of hospitalized neonates by raising awareness of care pathways, and ensuring clear communication, thus reducing harmful practice variation.

Theoretical Foundation and Conceptual Bases

The study was underpinned by Avedis Donabedian structure, process and outcome (SPO) model to measure and evaluate the quality of healthcare which gives an insight into the factors that accounts for satisfaction or dissatisfaction among clients [21]. The Donabedian framework was adapted to assess the influence the structure and process have on the outcome (satisfaction with care at NICU). A modification was made by adding demographic characteristics of parents of babies admitted at NICU. The availability of staff either adequate or not can affect the attitude of staff towards work as well as towards parents of neonates which can lead to a satisfaction or dissatisfaction of parents of neonates admitted in NICU. The status of the newborn can determine the satisfaction or dissatisfaction of the parents of the newborn admitted in NICU. The neonate, if responding to treatment will lead to a satisfaction of parents. *See figure 1*

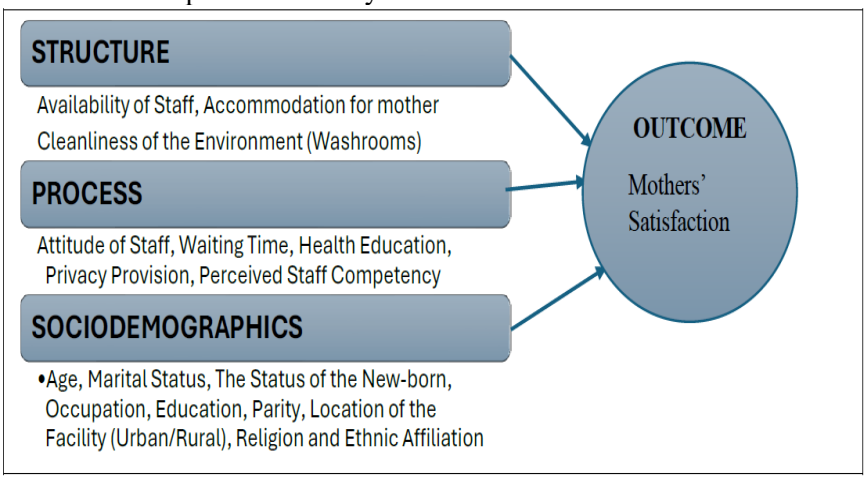

Figure 1. Conceptual Framework Adapted from (Donabedian, 1988) [8]

Method

Study Setting

The setting of this study were the two government hospitals in Tamale Metropolis namely

Northern Regional Hospital and Tamale West Hospital.

Profile of the Northern Regional Hospital

The Northern Regional Hospital occasionally serves as referral points for the communities in Tamale Metropolis. The hospital provides quality expertise for comprehensive health services as well as technical supervisory support in the clinical services to the sub-district. The Hospital provides Secondary Health care service in the Metropolis. The hospital has a total Bed capacity of 141 and average daily admissions are around 80 while average daily outpatient attendance is between 250 and 300.

Profile of Tamale West Hospital

It was opened in April 1998 as a polyclinic and was upgraded to the status of a district hospital in the same year. It is currently the referral hospital for the Tamale metro sub-district health centres. It is a 186-bed capacity hospital with eight functional wards and provide 24-hour service that includes OPD, pharmacy, antenatal care, laboratory services, theatre services, ear, nose, and throat care and psychiatry. The Neonatal Intensive Care Unit was built in November 2021.

Study Design

This study is primarily qualitative using phenomenology approach that seeks to explain the experiences and perceptions of parents. It was used to gain an understanding of parents with babies admitted at NICU. This approach was aimed at focusing on commonality (lived experience) of parents with babies admitted at the neonatal intensive care unit to construct the meaning of events, situation or experience to make a profound conclusion.

Participant Recruitment

The research Participants involved parents or caregivers with babies admitted at NICU in Northern Regional Hospital and Tamale West Hospital. Only parents who consented to take part in the study and only parents with babies admitted for at least 8 hours at the NICU were included in the study. Participants were purposively selected till saturation after the ninth person. Recruitment was carried out alongside data collection, data saturation occurred when the nineth (9th) participant was interviewed, and no newer themes or information emerged.

Purposive sampling allows the researcher to select participants who have experienced the phenomenon and so can provide rich data.

Data Collection Tool and Procedure

The study employed a semi-structured interview guide to collect the data. Semi-structured interview guide allowed the researcher to ask flexible questions and probed further to appreciate the experiences shared by the participants on the phenomenon (Creswell & Creswell, 2018). This guide was developed based on literature review and guided by the framework. The interview guide collected data on the biodata, structure of the facilities, process and outcome of health care. Data collection started with collecting information on the demographics of the study participants. This was followed by the main experiences regarding care. An informed consent was given before commencement of interviews which were recorded with a tape recorder and backed with a phone record as well. There were probes where necessary for more clarity.

Data Quality

The data collection was done by only trained research person and that was the researcher. This ensured consistency in the interviewing. The interview guide was pre-tested at a separate

setting different from the study area. This ensured that the questions were eliciting relevant responses. Data was also stored under lock and key.

Ethical Considerations

To guarantee a responsible and ethical study, the researchers gave ethical standards priority

in the qualitative study. Participants gave their informed consent, their privacy and confidentiality were safeguarded, and they were free to decline or withdraw from participation at any moment. Ethical consent was also approved by the University for Development Studies Institute of Research Board with Reference Number UDS/RB/156124.

Data Management and Analysis

The interview recordings were transcribed verbatim. Initial coding was done after reading through each transcript. Repeated readings gave the researcher in-depth understanding, and some codes were modified. These codes were categorized according to similarities and with the framework in mind, into categories and then thematic areas as per the constructs of the Donabedian framework.

Results

Three themes and thirteen subthemes (Table 1) of these parents' experiences and perceptions toward health care delivery at Neonatal Intensive Care Unit were derived from the interviews.

Three core themes were derived and seven sub themes from the study as illustrated below.

Table 1. Core Themes and Subthemes

Core Themes	Subthemes
Theme: Structure	1. Accommodation 2. Health Equipment 3. Ward Hygiene 4. Qualified Health Staffs
Theme 2: Process	1. Privacy 2. Healthcare Provider-patient interaction 3. Waiting time 4. Health Education 5. Attitude of staff 6. Perceived staff competency 7. Perceived staff knowledge level 8. Timely health care service delivery
Theme 3: Outcome	1. Satisfaction.

Theme 1: Structure

This theme seeks to explain the health care infrastructure of the study settings. It has four subthemes including accommodation, health equipment and logistics, ward hygiene concerns and qualified health staff.

Subtheme 1 Accommodation

Generally, participants' experiences were based on the space of the room, the comfort of the room and proximity to the ward. Participants view it as a central issue in their experiences. Whereas participants' express worries about the closeness of the mothers' resting place and the ward, others were concern about the accommodation space being

inadequate in size. The study settings have accommodation for mothers whose newborns are admitted in NICU.

> "*There is accommodation for us, but it is not enough, the beds are not closer to our newborns, we sometimes don't hear our newborn cry. Last night, I did not sleep, I became a co-nurse in assisting the night nurses in waking the mothers up to breastfeed their newborn".* Participant A, female
>
> *"There is accommodation for us, but the room is small, and the number of beds is not enough for the number of admissions. The room is hot. As you can see, I am sweating profusely".* participant I, female

Despite the accommodation, participants wished they were much closer to their newborn such as sharing the same bed with their newborn. Being far from them would not only bring insomnia but insecurity as they would be wondering the state of their newborn when they are far apart.

Subtheme 2 Health Equipment and Logistics

Medical equipment or machines as well as medical logistics being it consumables or not should always be available at health facilities. Being an intensive care unit, the health equipment should be in abundance.

However, all participants in the study settings had different experiences about health equipment. All participants complained that there are no consumables in the facilities.

> *"The hospital consumables are not available at all; common syringes and needles are not available at all".* Participant F, female.

All participants have the view that, there are some medical equipment or machines in the ward which aids in health care delivery in the unit. However, most of them do not know their efficacy.

> *"As for the quality of machines in the ward, hmmmm, apart from the one in which the staff put baby in to warm up baby when they are cold, the rest, I don't think it is of good quality".* Participant E, Male.

Some were emotional about the financial burden or extra cost because of lack of medical logistics.

> *"The health equipment are not enough for the ward, we buy some consumables, infusions, and medication. We have bought a lot now we don't have money again".* Participant I, Female
>
> *"I have been buying injections and other medical consumables. Sometimes it stresses me when am told to buy and I don't have enough money or when it is not available in the nearest pharmacy".* Participant E, male.

Inadequate health equipment or machines as well as consumables and non-consumables (logistics) retards health care services to patients. In the long run may lead to death. These health logistics (cotton, syringes and needles of different sizes), emergency medication medications such as Salbutamol; emergency machines such as nebulizers, oxygen cylinder with oxygen in it.

> *"The most annoying part is one of the newborns was gasping for breath, I called one of the staff to come save the baby's life, when he came into the ward, he just looked at the newborn and said, her mother already wanted the baby dead so leave her. He did not attend to that baby. The following morning, when the morning staff took over, they did their best to save the baby's life, but it was too late".* Participant I, female

Subtheme 3 Ward Hygiene Concern

Newborns are susceptible and prone to infections. Exposing them to harmful micro-organisms such as Streptococcus aureus, Staphylococcus and *E. coli* among others can lead to diarrhoea in the long run dehydration

and other diseases. The wards and it environ should be cleaned when necessary. A cleaning schedule should be drawn, and cleaners should be up and doing. Committed cleaners should be awarded and dismiss the lazy ones. The hygiene of the ward was viewed by participants as good, better and bad.

> "*The cleanliness is not good because the cleaners did not come to clean today. See how the place is unkempt. They claim we should remove our sandals before crossing the red line to prevent infection and now the ward and it's environed is not swept thoughtless of mobbing it. So where is the infection prevention?".* Participant I, female

Subtheme 4 Qualify Health Staff

Most of the participants said there are qualified health staffs in the facilities. However, participant thought otherwise.

> "*There are no qualified health staffs in the facilities because they do not exhibit their qualified skills. Being qualified does not necessarily mean administration of medications and other minor invasive procedures but the skills and techniques involve in carrying out nursing procedures".* Participant I, female.

Theme 2: Process

This theme seeks to inquire about Perception Level and Quality of Care. Subthemes including privacy, healthcare provider-parent interaction, waiting time, attitude of staff, health education, perceived staff competency, perceived staff knowledge level and timely health care service delivery emerged from the interview.

Subtheme 1 Privacy

It is the ability of an individual or group to seclude themselves or information about themselves. Most participants were of the view that, there is no privacy in the ward. Six out of the nine participants thought so, while the remaining thought otherwise.

> *"There is no privacy in the ward and the mothers' room at all. Everyone in the ward and room sees what you are doing, sometimes am not comfortable in the mothers' room because of that".* Participant F, female.
>
> *"... there is no privacy at all. You can easily see the procedures carried out on the next patient and even predict a sign and symptom. For instance, I saw a newborn lying next to mine and some tubes were connected to his nostrils and to a machine. I predicted that, that newborn could not breath and the machine was helping him to do so".* Participant D, female.

Interestingly, a participant thought otherwise. "*I think there is privacy because no one knows what is wrong with my newborn and I don't know of theirs either."* participant H, male

Subtheme 2 Healthcare Provider –patient Interaction

The interaction between health care provider and parents whose newborns were admitted in NICU differ from one another. Most participants said they had good interaction with the healthcare provider while others thought otherwise

> *''There is effective communication between we and the nurses".* Participant A, female.
>
> *"There is no effective communication between us".* Participant I, female.
>
> *"As for the communication, hmmm, some staff don't want to talk to you at all. They only talk to you when they need things like, pampers, or extra white cloth. When I delayed in bringing them, they shout at me and say all sorts of things I don't even understand."* Participant D, Female.

"Some of the staff don't care about us. For instance, the night nurses punished us a lot. They did not assist us to attach properly to our newborn to breastfeed. I personally asked for that help, and they refused." Participant C, Female.

Subtheme 3 Attitude of Staff

The attitude of staff especially nurses and midwives, towards the parents whose newborn were admitted in the hospital was relatively warm as narrated by most participants. Interestingly, a participant thought otherwise and was emotional.

Hmmm, madam, the attitude of the health staff is very poor. They don't have time for myself and my newborn at all. ... My newborn umbilical cord was not cared for and when I reminded one of the morning staff, he told me it was not the duty of the morning staffs, but that of the night staff, meanwhile, the night staff did not do it. When I tried caring for the umbilical cord, I was shouted at and told I was too knowing." participant I, female

"Some staff do not have good attitude towards us. Some of them neglect us and fidget with their phones." Participant D, female.

Subtheme 4 Waiting Time

The waiting time is the duration of time a client spends in the hospital before healthcare is being rendered to them. Most participant thought the waiting thought the waiting period was short while others thought it was long. Interestingly, a participant thought it depends on the individual staff.

"The waiting period depends on the kind of staff you meet. ... the good ones will receive you well whilst the bad ones will neglect you and only start rushing when they realized you are dying." Participant D, female.

"... they attended to us without hesitation." Participant F, female

"The waiting period is very long. It was an emergency case, but we were not treated as such." Participant C, female.

Subtheme 5 Health Education

Generally, participants experience was based on not enough, no education and educated on their newborn ailment. Equal number of participants were of the view that they were educated, and the education was not enough.

"I was educated on my newborn condition." Participant B, female

"There was not enough education given to me about my newborn ailment." Participant A, female.

"I wasn't educated on my newborn's condition, and I actually don't know the reason for the admission." Participant E, male.

Subtheme 6 Perceived Staff Competency

All the participants thought that the health staff are competent enough to deliver health services to their cherished clients, but participant thought otherwise.

"The staff are not competent enough… can you imagine, when they passed the cannula, infusions as well as medications were given, few hours later, the site was swelling but they didn't even notice it. My newborn cried a lot any time that site is being touched. They continued the administration without even bothering at all." Participant I, female

Subtheme 7 Perceived Staff Knowledge Level

*P*articipant were of the view that, the health staff have the requisite knowledge to deliver health services, except participant I.

"They are not knowledgeable and skilful as they are expected to be. ...they do not exhibit their skills." participant I, female

Subtheme 8 Timely Health Care Service Delivery

Few participants were of the view that health care services were rendered on time, while others thought they were delayed.

> *"…we were attended to immediately we got to the nearest nurse…"* Participant E, male
>
> *"… health care delivery was not delivered to me on time."* Participant I, Female.

Theme 3 Outcome

This theme seeks to inquire about parents' satisfaction or otherwise of health care delivery at neonatal intensive units.

Subtheme 1 Satisfaction/Dissatisfaction

Some expressed how satisfied they are with the health care delivery rendered to them while others lamented with emotions.

> "*I am satisfied with how the health staff take care of my child. They are patient and tell me what to do for my newborn and subsequent ones to come not to suffer from rotten umbilical cord again".* Participant B, female
>
> Participant "I" says contrary to that. *"I am not satisfied with the health care rendered to my newborn. …there is no doctor available during weekends. What annoys me is, even emergency cases, there is no doctor available…"* Participant I, female

Recommendations of Respondents

According to participant 'A' '*'I recommend that, staff should assist in taking of medication for patients and mothers should lye close to their newborn, that is side by side".*

According to participant 'D', '*'I recommend that the washroom should be washed frequently for instance every 6 hours. As for the attitude of the staff, secret cameras should be placed in every ward and its environment to trap such staff, and they should be punished accordingly whiles the well-mannered and kind-hearted staff should be awarded accordingly as well. ''*

According to participant 'I', '*' I recommend that, the public should be educated on their rights and responsibilities during the admission of their relatives. By so doing we should know what we are supposed to do and what not to do. This prevents unhealthy quarrels and misunderstanding between health workers and patients or patient relatives.*

Discussion

When neonates are admitted in NICU, mothers and care givers do not get in touch with them as often as needed. This has become a new situation for them, and being separated from their neonates reduces their breastfeeding role and relationship. This finding aligns with previous literature where mothers disliked the maternal baby unit policy of only allowing them to visit their newborns at set hours (when neonate needs to be breastfed). This regulation prevented them from having access to their neonates whenever they wished, resulting in a sense of separation and loss of control, which could harm the wellbeing of mothers [22]. However, in contrast to these literatures, in this study, even if mothers were given limited time to visit their babies, none of them complained. The difference might be that mothers trusted the healthcare providers more in this study, or they might have chosen to remain silent for fear of the NICU regulations. Mothers should be allowed to have frequent visits with their babies to increase their relationship with them, and that will contribute to their hope of survival of their babies.

Research shows important benefits of parental involvement in neonatal intensive care. Parents spending time with their newborns and especially their engagement in skin-to-skin contact has positive impacts on cognitive development of neonates and lowers morbidity and mortality rates [21, 23]. To increase the time families, spend with their newborn babies in NICUs, some hospitals such as Norther

Regional Hospital and Tamale West Hospital provide rooms to allow parents to stay with their neonates 24 hours a day. the facilities provided a lounge room for parents but not infant-parent rooms. However, their experiences were based on the space and comfort of the room as well as the proximity to the ward. When the beds are not closer to their newborns, they find it difficult to hear the cry of their newborn.

This study finding indicates that, the environmental hygiene of the study setting is relatively poor, including lack of space for bathing, space for cooking, an inconvenient toilet, and a lack of space for families to rest when they came to visit, especially at night. Following hygiene protocols in hospitals, particularly in the NICU, is recognized as one of the most important means to prevent and control the spread of health care-associated infections. Babies born premature or sick cared for in the NICU are at especially high risk of health
care-associated infections. This study agrees with a study conducted in Ghana, which reveals deficiency of water for toilets and hygiene, insufficient bathroom for mothers to take shower, inadequate space to take rest, and inadequate time to visit their neonates, unsatisfactory hygiene and cleanliness of the ward, improper ventilation, and insufficient comfortable chairs [24]. This is to explain that there is the need to improve upon the hospital and ward hygiene.

Inadequate health equipment and logistics are a major concern to participants as they have reported various experiences during their stay in the facilities for the healthcare of their newborns. This study agrees with previous study in Ethiopia, which discovered inadequate medical supplies for the care of newborns in the NICU, such as medicines being unavailable, reagents not being available, and other medical consumables being inadequate [22].

Attitudes and behaviours of health workers were largely driven by moral judgement of clients. It follows that some clients who challenged the authority of health workers in this study were labelled as uncooperative or difficult thereby incurring the displeasure of health workers. Participants experienced a variety of emotions including fear, guilt, and anxiety. This study found that parent dissatisfaction of care is because of ill attitude of health workers towards work and parent. This finding agrees with previous studies, which pointed out that improper attitudes of health personnel as people who are in touch with patients impose more pressure on patients [22, 24].

In this study, mothers expressed that healthcare providers are their major source of support and care. This finding is in line with other studies where mothers considered nurses as their major support source and felt more secure when they saw competent and affectionate care for their newborns provided by health workers. Moreover, the nurses support the family by reassuring them that they would be updated with any changes in the infant's condition and strengthening maternal responses to their infants [22]. This suggests that the care and support provided by health care providers to mothers would be beneficial in allowing mothers to discuss their shared experience. So that health care provider support should be encouraged and maintained.

Conclusion

The study concluded that inadequate environmental hygiene, and poor communication between patients and parents have all contributed to some patients' negative ward experiences. Nonetheless, the study found that most parents can cope with medical staff well enough because their newborns are ill.

Recommendation

The construction of a pharmacy and laboratory department, as well as their refurbishment with the required medications and equipment in all NICU departments, should

be of great interest to the Ghana Health Service, NGOs, and Stakeholders.

Health facilities should undergo routine inspections, and meritorious employees should get recognition.

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Conflicts of Interest

The authors declare no competing/conflicts of interests.

Informed Consent

Written consent was sought after participants were counselled and the questionnaires explained to the best understanding of the participants before questionnaire administration.

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References

[1]. Guerrera, G., 2015, Neonatal and pediatric healthcare worldwide: A report from UNICEF, *Clin. Chim. Acta*, vol. 451, pp. 4–8, 2015.

[2]. Aleem, S., and Bhutta, Z. A., 2020, Neonatology: A Global Perspective," in *Pediatric and Adolescent Medicine*, vol. 22, E. Herting and W. Kiess, Eds., S. Karger AG, 2020, pp. 1–12. doi: 10.1159/000495429.

[3]. Tekelab, T., Chojenta, C., Smith, R., and Loxton, D., 2019, The impact of antenatal care on neonatal mortality in sub-Saharan Africa: A systematic review and meta-analysis, *PLOS ONE*, vol. 14, no. 9, p. e0222566, Sep. 2019, doi: 10.1371/journal.pone.0222566.

[4]. Msemo, G., *et al.*, 2013, Newborn Mortality and Fresh Stillbirth Rates in Tanzania After Helping Babies Breathe Training, *Pediatrics*, vol. 131, no. 2, pp. e353–e360, Feb. 2013, doi: 10.1542/peds.2012-1795.

[5]. Bitew, Z. W., Alemu, A., Ayele, E. G., Jember, D. A., Haile, M. T., and Worku, T., 2020, Incidence Density Rate of Neonatal Mortality and Predictors in Sub-Saharan Africa: A Systematic Review and Meta-Analysis, *Int. J. Pediatr.*, vol. 2020, pp. 1–14, Oct. 2020, doi: 10.1155/2020/3894026.

[6]. Poulin, D., *et al.*, 2024, Infant mortality in Ghana: investing in health care infrastructure and systems," *Health Aff. Sch.*, vol. 2, no. 2, p. qxae005, Feb. 2024, doi: 10.1093/haschl/qxae005.

[7]. Coertze, T., Effectiveness of the implementation of psycho- educational sessions on parental stress in a neonatal intensive care unit.

[8]. Donabedian, A., 1988, The Quality of Care: How Can It Be Assessed? JAMA. 1988;260(12):1743–1748. doi:10.1001/jama.1988.03410120089033," *Cureus*, Jul. 2021, doi: 10.7759/cureus.16747.

[9]. Cambonie, G., *et al.*, 2023, Context of a neonatal death affects parental perception of end-of-life care, anxiety and depression in the first year of bereavement," *BMC Palliat. Care*, vol. 22, no. 1, p. 58, May 2023, doi: 10.1186/s12904-023-01183-8.

[10]. Dellenmark-Blom, M., and Wigert, H., 2014, Parents' experiences with neonatal home care following initial care in the neonatal intensive care unit: a phenomenological hermeneutical interview study," *J. Adv. Nurs.*, vol. 70, no. 3, pp. 575–586, Mar. 2014, doi: 10.1111/jan.12218.

[11]. Heidari, H., Hasanpour, M., and Fooladi, M., 2017, Stress Management among Parents of Neonates Hospitalized in NICU: A Qualitative Study, *J. Caring Sci.*, vol. 6, no. 1, pp. 29–38, Mar. 2017, doi: 10.15171/jcs.2017.004.

[12]. Kelleher, J., Dempsey, J., Takamatsu, S., Paul, J. J., Kent, E., and Dempsey, A. G., 2022, Adaptation of infant mental health services to

preterm infants and their families receiving neonatal intensive care unit services during the COVID-19 pandemic," *Infant Ment. Health J.*, vol. 43, no. 1, pp. 100–110, Jan. 2022, doi: 10.1002/imhj.21961.

[13]. Aydon, L., Hauck, Y., Murdoch, J., Siu, D., and Sharp, M., 2018, Transition from hospital to home: Parents' perception of their preparation and readiness for discharge with their preterm infant," *J. Clin. Nurs.*, vol. 27, no. 1–2, pp. 269–277, Jan. 2018, doi: 10.1111/jocn.13883.

[14]. Johnson, A. N., 2008, Engaging Fathers in the NICU: Taking Down the Barriers to the Baby," *J. Perinat. Neonatal Nurs.*, vol. 22, no. 4, pp. 302–306, Oct. 2008, doi: 10.1097/01.JPN.0000341361.37822.34.

[15]. Hynan, M. T., 2006, Supporting fathers during stressful times in the nursery: an evidence-based review, *Newborn Infant Nurs. Rev.*, vol. 5, no. 2, pp. 87–92, 2005.

[16]. Franklin, C., 2006, The neonatal nurse's role in parental attachment in the NICU," *Crit. Care Nurs. Q.*, vol. 29, no. 1, pp. 81–85, 2006.

[17]. Harrison, W., and Goodman, D., 2015. Epidemiologic Trends in Neonatal Intensive Care, 2007-2012," *JAMA Pediatr.*, vol. 169, no. 9, p. 855, Sep. 2015, doi: 10.1001/jamapediatrics.2015.1305.

[18]. Abukari, A. S., A MODEL OF FAMILY-CENTERED CARE AT THE PAEDIATRIC AND NEONATAL INTENSIVE CARE SETTING IN GHANA".

[19]. Smith, V. C., Hwang, S. S., Dukhovny, D., Young, S., and Pursley, D. M., 2013, Neonatal intensive care unit discharge preparation, family readiness and infant outcomes: connecting the dots," *J. Perinatol.*, vol. 33, no. 6, pp. 415–421, Jun. 2013, doi: 10.1038/jp.2013.23.

[20]. Torab, et.al., 2017, Knowledge and attitude of personnel, key factors in implementation of neonatal pain management in NICU: a qualitative study, *J. Clin. Diagn. Res.*, vol. 11, no. 11, pp. SC05–SC09, 2017.

[21]. Kinshella, M. L. W., *et al.*, 2021, Barriers and facilitators of facility-based kangaroo mother care in sub-Saharan Africa: a systematic review," *BMC Pregnancy Childbirth*, vol. 21, no. 1, p. 176, Dec. 2021, doi: 10.1186/s12884-021-03646-3.

[22]. Mimani Minuta, W., *et al.*, 2023, Lived Experience of Mothers Having Preterm Newborns in a Neonatal Intensive Care Unit at Wolaita Sodo University Comprehensive Specialized Hospital Southern Ethiopia: A Phenomenological Study," *Res. Rep. Neonatol.*, vol. Volume 13, pp. 1–14, Aug. 2023, doi: 10.2147/RRN.S417173.

[23]. Bigelow, A. E., and Power, M., 2020, Mother–Infant Skin-to-Skin Contact: Short- and Long-Term Effects for Mothers and Their Children Born Full-Term," *Front. Psychol.*, vol. 11, p. 1921, Aug. 2020, doi: 10.3389/fpsyg.2020.01921.

[24]. Lomotey, A. Y., Bam, V., Diji, A. K., Asante, E., Asante, H. B., and Osei, J., 2020, Experiences of mothers with preterm babies at a Mother and Baby Unit of a tertiary hospital: A descriptive phenomenological study," *Nurs. Open*, vol. 7, no. 1, pp. 150–159, Jan. 2020, doi: 10.1002/nop2.373.

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Acceptability of COVID-19 Vaccination among Healthcare Workers in Adamawa State, Nigeria

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Abstract

The aim of this study was to determine the acceptability of COVID-19 vaccine amongst health workers in Adamawa state, Northeast Nigeria. The study used a cross-sectional design and collected data from the eligible participants through google online form. Information regarding the respondents' such as socio-demographic, risk exposures, risk perceptions and attitude towards COVID-19 vaccine were collected. Multivariable binary logistic regression will be used to determine the factors affecting the acceptability of COVID-19 vaccine after controlling for key demographic variables. Data analysis was using STATA version 14 (StataCorp LP, Texas USA). A total of 272 healthcare workers from Adamawa State Nigeria participated in this study. About 70% of the respondents were females, one-third were younger than 40 years and majority (57.7%) were non-frontline workers. Two hundred and thirty-nine (87.9%) of the participants have had COVID-19 vaccine while 33(12.1%) have never received. Of those who have been vaccinated, only 130(54.4%) were fully vaccinated. Among the unvaccinated, 69.7% insisted they will not take the vaccine if made available because COVID-19 infection has reduced globally (33.3%) and probable side effects of the vaccine (33.3%). Age (OR = 0.11, 95% CI: 0.02 – 0.55, p value = 0.007)., sex (OR = 5.23, 95% CI: 1.78 – 15.39, p value = 0.003) and years of work experience OR = 21.44, 95% CI: 3.58 – 12.85, p value = 0.001) were significant predictors of acceptability of COVID-19 vaccine.

Keywords: *COVID-19, Healthcare Workers, Predictors, Vaccination.*

Introduction

Since the declaration of the Coronavirus disease 2019 (COVID-19) pandemic as a global threat by WHO in March 2020 (1), a total of 453,774, 980 confirmed cases and 6,051,450 deaths were recorded by 11th March 2021 [2]. In Nigeria, the total number of confirmed cases within this same period was 254,861 and 3,142 associated deaths and for Adamawa State the figure was 1203 confirmed cases and 32 deaths [3]. The whole world experienced a global humanitarian disaster due to the rapid spread and infectiousness of the COVID-19 disease. This pandemic affected the way we lived because all countries of the world were forced to implement strict precautions and control strategies to limit the extent of the outbreak. Such measures included social distancing and compulsory use of face masks. Other measures that were imposed by governments include international travel bans, lockdowns, frequent handwashing with soap and water or with the use of hand sanitizers [4, 5].

The pandemic was not just a health crisis, it also resulted in social, economic and political effects with potential for deep and longstanding scars. According to a study conducted by [21] Andam et al (2020) which analysed the five-week lockdown implemented by the federal government across the Federal Capital Territory of Abuja and Lagos and Ogun states from late March to early May 2020, the federal

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lockdown for Kano from mid-April, and the state-level lockdowns that were implemented from mid-April for around seven weeks in Akwa Ibom, Borno, Ekiti, Kwara, Osun, Rivers, and Taraba states, It was estimated that during these lockdown periods, Nigeria's GDP suffered a 34.1 percent loss due to COVID-19, amounting to USD 16 billion, with two-thirds of the losses coming from the services sector. Also, the agriculture sector, which happens to be the major means of livelihood for most Nigerians, suffered a 13.1 percent loss in output (USD 1.2 billion). Therefore, to avert these health and socio-economic maladies and end the COVID-19 pandemic, an important strategy will be to develop a safe and efficacious vaccine to curtail the virus, and the success of the vaccination program will depend on whether people refuse or accept the vaccine.

Health workers worldwide were not spared from the burden of the pandemic. Globally, the World Health Organization estimated that between 80 000 and 180 000 health and care workers could have died from COVID-19 in the period between January 2020 to May 2021, converging to a medium scenario of 115 500 deaths [1]. In Adamawa state, as at 20th January 2022, 61 health workers have been confirmed positive with only 1 death [7].

To quickly limit the spread of COVID-19 associated infection and death, researchers and pharmaceutical companies have collaborated and still doing same to develop safe and effective vaccines for mass vaccination. This has led to the development of several vaccines such as Pfizer, Oxford/AstraZeneca, Moderna, Janssen, Sputnik V, Sinovac, and Sinopharm which have been found to be safe and effective for use in humans [8-11]. Despite this technological progress, the supply of these COVID-19 vaccines globally for use have been inadequate leading to governments prioritising high risk groups such as health care workers, older persons especially those with chronic co-morbid conditions, and those in essential services to be given the vaccine before other persons [11].

Health care workers can easily be infected with COVID-19 virus because they often have direct contact with body secretions, patients, visitors and other health care workers who might have been exposed to COVID-19. Although, COVID-19 vaccines have been made available by governments to health workers and other high-risk individuals, this may not readily translate into uptake because vaccine uptake is voluntary. The literature has also shown that health care workers are not willing to accept COVID-19 vaccines when made available in their country [12–14]. Reasons for refusing the vaccine include safety, side effects and the rapid speed of vaccine development/approval [15–17].

Health care workers have been identified to be a reliable source of correct information on vaccination to the patients and general population [12, 18], thus their acceptance or refusal of COVID-19 vaccines may influence the uptake of COVID-19 among the general population. It has been shown that health workers' counsel on exclusive breastfeeding and complementary feeding influence the practice of exclusive breastfeeding among mothers [19, 20**],** reiterating the influence of health care workers' information and actions to guide the decision of the public healthcare. Therefore, this study sought to assess and identify the predictors of COVID-19 vaccine acceptability among health care workers in Adamawa State, Northeast Nigeria.

Materials and Methods

Study Area

This study was carried out in Adamawa State, Northeastern Nigeria. Adamawa State, popularly referred to as the "Land of Beauty" is one of the 36 States of the Federal Republic of Nigeria. It came into existence on the 27th of August 1991 occupying more than half of the old Gongola State.

Study Population

The study population for this study comprised of all health workers in Adamawa State who were members of the WhatsApp groups created for health workers in the State.

Study Design

This was an online cross-sectional study employing a quantitative method of data collection. Health care workers (HCWs) including but not limited to doctors, nurses, midwives, and laboratory technicians, aged 18 years or older, currently working in any health facility in Adamawa State and a member of any of the WhatsApp groups created for health workers in the State were eligible to participate.

Sample Size Determination

The sample size was calculated using the proportion of health workers in Nigeria who had received at least one dose of the COVID-19 vaccine according to a study conducted by Ilori *et al* (2021).

$$n = \frac{(Z\alpha)^2 pq}{\mathrm{d}^2}$$

Where: n= Sample size; Zα = Z statistic for the level of confidence of 95% (1.96), Zα = Z statistic for the level of confidence of 95% (1.96), p = proportion of health workers in Nigeria who had received at least one dose of the COVID-19 vaccine (80.3% or 0.803), q = 1 – p = 0.197 , d = Desired level of precision (5% or 0.05), n=243, with Adjusting for non-response using a rate of 10%, Minimum sample size = 267.

Sampling Technique

This study recruited participants from the WhatsApp communication platform dedicated to healthcare workers (HCWs) in Adamawa State. Invitations to participate in the study was shared on this platform using a self-reported questionnaire that will be made in google forms. Eligibility criteria include being 18 or older and currently a healthcare worker (HCW) in Adamawa State. Younger (aged less than 18 years) HCWs and those who had no access to WhatsApp were excluded.

Measures

COVID-19 Vaccine Acceptance. This was assessed by asking the HCWs one question Have you taken COVID-19 vaccine now that it is available? Response to this question was either "yes" or "no". Follow-up questions to the earlier one will be, if yes, how many doses of COVID-19 vaccine have you taken, If no, what are your reasons for not taking the vaccine.

COVID-19 Risk Exposure: This was measured with 2 items. The first item is "I am at high risk of COVID-19 because of my work exposure" and the second item is "I am at high risk of COVID-19 because of my personal exposure." Participants had 3 response options (1 true, 2 false, 3 not sure). Response on each item was dichotomized into 0 (false or not sure) and 1 (true) to indicate occurrences of exposure. Sum score was generated, with a higher score representing a higher level of COVID-19 risk exposure.

Perceived Susceptibility to COVID-19: This was assessed with 2 items that described scenarios associated with COVID-19 risk including "I am at high risk of COVID-19 because of my family medical history" and "I am at high risk of COVID-19 because my own underlying medical conditions." Participants responded to these items on a 3-option scale (1 true, 2 false, 3 not sure) to indicate if the scenarios apply to them. Responses were dichotomized into 0 (false or not sure) or 1 (true). Sum scores were generated, with high scores indicating higher perceived susceptibility of COVID-19.

Perceived Severity of COVID-19: This was assessed by participants' agreement of the statement "COVID-19 is just a flu-like disease and generally harmless." The response options ranged from 1 (strongly disagree) to 5 (strongly agree). The answer was reverse-coded with a

higher score indicating a greater perceived severity of COVID-19.

Validity and Reliability

The questionnaire was examined by the research supervisor for both face and content validity. Thereafter, the link to the questionnaire (in google forms) was shared with some of the researchers' contacts who are not HCWs on the WhatsApp communication platform. Other participants were recruited using a simplified-snowball sampling technique where the invited participants (those on the researchers' contact list) were requested to pass the invitations to their WhatsApp contacts.

Survey Questionnaire and Data Collection

Data was collected with the use of a self-administered questionnaire, which was developed after rigorous literature search and consisted of two parts: demographics and a section for COVID-19 vaccine acceptance and COVID-19 risk exposure, perceived susceptibility and severity.

Data Management and Analysis

Data was screened for proper coding, univariate outliers and normality. Sociodemographic characteristics was presented as frequency tables for qualitative variables and mean ± SD (Median and Range if not normally distributed) for quantitative variables. Objectives one, two and three were analysed using descriptive statistics like proportion, mean and standard deviation and for objective four, a bivariate analysis was conducted between all the explanatory variables and the study outcome, COVID-19 vaccine acceptability and uptake using chi-square test of significance. Variables that are significant at 20% was entered into a binary regression model to determine the factors that are independently associated with COVID-19 vaccine acceptability. All statistical analyses will be e done using STATA version 14 (StataCorp LP, Texas USA).

Limitations and Potential Study Biases

A key limitation of this study is its cross-sectional design which prevented us from drawing causal inference. Second, the participants were recruited by a convenience sampling, therefore we need to exercise caution in applying the results in other settings or populations. Third, the self-report survey may be subject to social desirability. Finally, given that data collection took place after COVID-19 vaccine had been produced and distributed to all countries, this survey will assess acceptability of the vaccine by asking the health care workers if they had taken the vaccine unlike in other studies where COVID-19 vaccine acceptability was measure by the question.

Results

Socio-demographic Characteristics of the Respondents

A total of 272 healthcare workers from Adamawa State Nigeria participated in this study. About 70% of the respondents were females. About one-third were younger than 40 years while 71(26.1%) and 106(39.0%) were between 40-49 years and older than 49 years respectively. More than 80% had partners and resided in urban areas. One hundred and thirty-two (48.5%) had diploma, 87(32.0%) had bachelor's degree while 75(27.6%) had master's degree or higher. About 40% of the respondents have been working for more than 20 years, 87(32.0%) for between 11-20 years and 74(27.2%) for 10 years or less. Majority of the study participants (57.7%) were non-frontline workers (Table 1).

Table 1. Socio-demographic Characteristics of the Respondents

Variables	Frequency	Percentages
Age (years)		
<40	95	34.9
40-49	71	26.1
>49	106	39.0
Sex		
Male	82	30.2
Female	190	69.8
Marital Status		
With partner	232	85.3
Without partner	40	14.7
Education		
Diploma	132	48.5
Bachelor's degree	65	23.9
Master's degree or higher	75	27.6
Years of work experience		
≤10	74	27.2
11-20	87	32.0
>20	111	40.8
Residence		
Rural	49	18.2
Urban	221	81.8
Category of health worker		
Frontline	115	42.3
Non-frontline	157	57.7

COVID-19 Experience, Vaccination and Travel History of the Respondents

Less than 8% of the participants have any chronic conditions and were not vaccinated at childhood. Nine (3.3%) had been infected with COVID-19 virus while 23 (8.5%) and 96(35.3) had family members and co-workers respectively that had been infected with COVID-19 virus in the past. Forty-three (15.8%) travelled outside the country in the last 12 months prior to this survey (Table 2).

Table 2. COVID-19 Experience of the Respondents

Variables	Frequency	Percentages
Do you have any chronic health conditions?		
No	251	92.3
Yes	21	7.7
Did you receive any vaccination apart from childhood immunization?		
No	17	6.3
Yes	255	93.7

Have you ever been infected with COVID-19 virus?		
No	263	96.7
Yes	9	3.3
Has any of your family members been infected with COVID-19 virus?		
No	248	91.5
Yes	23	8.5
Has any of your co-worker been infected with COVID-19 virus?		
No	176	64.7
Yes	96	35.3
Did you travel outside Nigeria within the last 12 months?		
No	229	84.2
Yes	43	15.8

COVID-19 Vaccine Acceptability

Two hundred and thirty-nine (87.9%) of the participants have had COVID-19 vaccine while 33(12.1%) have never received. Of those who have been vaccinated, only 130(54.4%) were fully vaccinated. Among the unvaccinated, 69.7% insisted they will not take the vaccine if it is made available in their health facility. The major reasons given for not taking the vaccine were that COVID-19 infection has reduced globally (33.3%), not sure of the effects of the vaccine (33.3%) and that the vaccine is more dangerous than the virus (Table 3).

Table 3. COVID-19 Vaccine Acceptability among the Respondents

Variables	**Frequency**	**Percentages**
Have you received COVID-19 vaccine?		
No	33	12.1
Yes	239	87.9
If yes, are you fully vaccinated?		
No	109	45.6
Yes	130	54.4
If no, will you take the vaccine if available in your facility?		
No		
Yes		
If no, what are your reasons for not accepting the vaccine? β		
COVID-19 infection has reduced globally	18	33.3
I am not at peace with the vaccine	18	33.3
The vaccine is more dangerous than the virus	9	16.7
I have immunity against the virus, so I don't need to be vaccinated	2	3.7
The vaccine is not safe	3	5.6
The vaccine itself can cause the infection	4	7.4

Risk Exposure and Perceived Susceptibility of COVID-19

More than 80% of the respondents opined they are at high risk of COVID-19 because of work exposure. Only 62% felt they were at high risk of COVID-19 because of my personal exposure. About 8% thought they are susceptible to COVID-19 because of family medical history while 15% felt they were susceptible because of underlying medical conditions (Table 4) When the respondents were asked 'if COVID-19 is a harmless disease because it is flu-like', 15.7% agreed, 6.0% were neutral and 78.3% disagreed (Table 4).

Table 4. Risk Exposure and Perceived Susceptibility of COVID-19

Variables	False (%)	Not sure (%)	True (%)
I am at high risk of COVID-19 because of my work exposure	18 (6.7)	26 (9.7)	225 (83.6)
I am at high risk of COVID-19 because of my personal exposure	47(17.7)	55(20.8)	163 (61.5)
I am at high risk of COVID-19 because of my family medical history	172 (63.2)	77(28.3)	21 (7.7)
I am at high risk of COVID-19 because of my underlying medical conditions	177 (65.1)	54(19.9)	41(15.1)

Associations between and Willingness to Accept COVID-19 Vaccine

Age was significantly associated with the willingness to accept COVID-19 vaccine among healthcare workers in Adamawa State ($p = 0.008$). HCWs older than 49 years (98.1%) were more willing to accept the vaccine compared to those between 40-49 years (87.3%) and those younger than 40 years (87.4%). The proportion of women willing to accept COVID-19 was significantly higher than men (96.3% vs 80.5%, $\chi2 = 18.54$, $p < 0.0001$). Participants who have been working for more than 20 years (98.2%) and those working for between 11-20 years (96.6%) were significantly ($\chi2 = 33.24$, $p < 0.0001$) more willing to accept COVID-19 vaccine as against those who had been working for 10 years or less. Acceptability of COVID-19 vaccine varied significantly by location of residence and category of health worker. Those residing in rural areas were more willing to accept the vaccine compared to the urban dwellers (100.0% vs 89.6%, $\chi2 = 18.54$, $p < 0.0001$) while non-frontline workers were more willing to accept the vaccine compared to their counterparts in the frontline (100.0% vs 90.8%, $\chi2 = 7.67$, $p = 0.006$) (Table 5).

Table 5. Associations between and Willingness to Accept COVID-19 Vaccine

Variables	Total	No. (%) willingness to accept COVID-19 vaccine	$\chi2$	p-value
Age (years)				
<40	95(34.9)	83(87.4)	9.68	**0.008**
40-49	71(26.1)	62(87.3)		
>49	106(39.0)	104(98.1)		
Sex				
Male	82(30.2)	66(80.5)	18.54	**<0.0001**
Female	190(69.8)	183 (96.3)		

Marital Status				
With partner	232(85.3)	213(91.8)	0.14	0.704
Without partner	40(14.7)	36(90.0)		
Education				
Diploma	132(48.5)	116(87.9)	5.03	0.081
Bachelor's degree	65(23.9)	63(96.9)		
Master's degree or higher	75(27.6)	70(93.3)		
Years of work experience				
≤10	74(27.2)	56 (75.7)	33.24	**<0.0001**
11-20	87(32.0)	84 (96.6)		
>20	111(40.8)	109(98.2)		
Residence				
Rural	49(18.2)	49(100.0)	5.57	**0.018**
Urban	221(81.8)	198(89.6)		
Category of health worker				
Frontline	115(42.3)	99(86.1)	7.67	**0.006**
Non-frontline	157(57.7)	150(95.5)		
Having chronic conditions				
No	251(92.3)	228(90.8)	2.10	0.147
Yes	21(7.7)	21(100.0)		
Infected with COVID-19				
No	263(96.7)	242(92.0)	2.28	0.131
Yes	9(3.3)	7(77.8)		
Family member infected with COVID-19				
No	248(91.5)	229(92.3)	2.57	0.109
Yes	23(8.5)	19(82.6)		
Co-workers infected with COVID-19				
No	176(64.7)	158(89.8)	2.02	0.155
Yes	96(35.3)	91(94.8)		
Perceived risk of COVID-19				
Low	225(82.7)	206(91.6)	0.0002	0.988
High	47(17.3)	43(91.5)		
Perceived severity				
Not severe	162 (60.5)	151(93.2)	1.68	0.195
Severe	106(39.5)	94(88.7)		
Perceived susceptibility				
Not susceptible	229(84.2)	208(90.8)	0.96	0.328
Susceptible	43(15.8)	41(95.4)		
Perceived susceptibility				
Not susceptible	229(84.2)	208(90.8)	0.96	0.328
Susceptible	43(15.8)	41(95.4)		

Predictors of COVID-19 Vaccine Acceptability

In this study age, sex, education, years of work experience and residence status were significant predictors of acceptability of COVID-19 vaccine. Participants aged 40-49 years are about 10 times less likely to accept COCID-19 vaccine compared to those less than 40 years (OR = 0.11, 95% CI: 0.02 – 0.55, p value = 0.007). Females are about 5 times more likely than male (OR = 5.23, 95% CI: 1.78 – 15.39, p value = 0.003) to accept COVID-19 vaccine while healthcare workers residing in urban areas have three times lower odds of accepting COVID-19 vaccine (OR = 0.11, 95% CI: 0.02 – 0.55, p value = 0.007). The higher the year of education, the more likely healthcare workers in Adamawa were willing to uptake COVID-19 vaccine. Compare to those who had been working for 10 years or less, healthcare workers with 11-20 years' experience are 21 times more likely to accept the vaccine (OR = 21.44, 95% CI: 3.58 – 12.85, p value = 0.001) and those who had been working for more than 20 years are about 37 times more likely to accept the vaccine (OR = 37.06, 95% CI: 3.57 – 38.38, p value = 0.002) (Table 6).

Table 6. Predictors of COVID-19 Vaccine Acceptability

Variables	Odds Ratio	95% Confidence Interval	p-value
Age (years)			
<40	1		
40-49	0.11	0.02 – 0.55	0.007
>49	0.25	0.02 – 2.81	0.260
Sex			
Male	1		
Female	5.23	1.78 – 15.39	0.003
Education			
Diploma	1		
Bachelor's degree	5.20	0.80 – 34.02	0.085
Master's degree or higher	1.52	0.46 – 5.05	0.493
Years of work experience			
≤10	21.44	3.58 – 12.85	0.001
11-20	37.06	3.57 – 38.38	0.002
>20			
Residence			
Rural	1		
Urban	0.32	0.16 – 0.87	0.01
Category of health worker			
Frontline	1		
Non-frontline	2.16	0.35 – 13.22	0.405

Discussion

Emerging variants of Coronavirus disease 2019 (COVID-19) claimed over 3000 lives in Nigeria and vaccination remains a means of reducing the death toll. Despite efforts by the government to ensure COVID-19 vaccination of most residents to attain herd immunity, myths and beliefs have adversely shaped the

perception of most Nigerians, challenging the uptake of COVID-19 vaccine. Hence this study aimed to assess the factors influencing the willingness to receive COVID-19 vaccine among health care workers in Adamawa State, Nigeria.

In this online survey, 88% of the participants were vaccinated with at least one dose of COVID-19 vaccine. This proportion of acceptability of the COVID-19 vaccines in this study is higher compared to other countries in the sub-Saharan Africa region. For example, the Nzaji et al. [21] study in the Democratic Republic of Congo found that approximately 28% of health care workers were willing to receive theCOVID-19 vaccines if available. The authors explained that the low willingness to receive COVID-19 vaccines can be attributed to misinformation on the quality of vaccines and spread of COVID-19 especially on social media. Misinformation and conspiracy theories have been identified as a barrier to the fight against COVID-19 [22].

Conversely, the acceptability of the COVID-19 vaccines among health care workers in this study was also higher than that reported in Saudi Arabia [23], China [24, 25], France [26], and the United States [27, 29, 30]. For instance, Shaw et al. [27] study in the United States found that about 58% of health care workers had the intention to receive COVID-19 vaccines if available. The relatively high acceptability of COVID-19 vaccines in these countries can be attributed to high publicity on potential COVID-19 vaccines in these countries. For instance, Barry et al. [28] acknowledged that their study in Saudi Arabia was conducted during the period of high publicity on potential COVID-19 vaccines, which could have influenced the attitudes and perceptions of health care workers. Also, Gagneux- Brunon et al.'s [27] study in France was conducted during the first pandemic wave. The finding of low acceptance of the COVID-19 vaccines in the present study is worrying considering the associated consequences. Research has shown that health care workers intending to be vaccinated plan to recommend the vaccines to family and friends [31]. This suggests that low acceptance of the COVID-19 vaccine among health care workers may have a negative impact on the general population. Also, the very high proportion of COVID-19 acceptability reported in our study may be influenced by the timing of the research. This study was conducted at a time that the vaccines were readily available worldwide.

In this study, age was significantly associated with the willingness to accept COVID-19 vaccine among healthcare workers in Adamawa State. Health care workers older than 49 years (98.1%) were more willing to accept the vaccine compared to those between 40-49 years (87.3%) and those younger than 40 years (87.4%). The fact that older HCWs accepted to get vaccinated may be due to the notion that older adults and people with serious comorbidities are particularly vulnerable to worse outcomes from COVID-19 can create considerable fear amongst the elderly [32]. Carla Felice and al. demonstrated that 10% of the infected people in Italy are HCWs [33]. Furthermore, 80 medical doctors and 25 nurses died from COVID-19 related complications in Italy. Many Italian HCWs were tested and many more may have been presenting with few symptoms, which underestimated the real impact of COVID-19 on this category [34]. In terms of sex, our results were different from other studies [21, 26, 27, 34], and we observed that more women were vaccinated compared to men. The higher likelihood for male health care workers to accept COVID-19 vaccination has been attributed to increased risk perception of the disease in men compared to women [21].

Most of the unvaccinated HCWs in this study reiterated that the likely negative effects of the COVID-19 vaccine as the main reason for their refusal. This finding is consistent with other studies [27, 28, 32]. For instance, a study in the Kingdom of Saud Arabia found concerns about the safety of vaccines and concern about

side effects as the main reasons for unwillingness to accept COVID-19 vaccines [24].

Conclusion

The attitude and uptake of vaccination by health professionals is associated with the acceptance of vaccination by patients and compliance with vaccination schedules and thus reduces aversion or hesitation towards vaccination [17]. To enhance the acceptability of COVID-19 vaccination among health care workers and the general population in Nigeria, policymakers in the health sector should address the concerns of health care workers about the safety and side effects of the COVID-19 vaccines as early as possible. Also, policymakers in the health sector should use both traditional and social media to strengthen public education on COVID-19.

Ethical Considerations

Ethical approval was sought from the Adamawa State Research Ethical Review Board**.** Letter of introduction was obtained from the researcher's institution to facilitate the process of obtaining data. All the HCWs were informed about the objectives of the study, and those that agreed to participate signed a consent form before filling the questionnaire. Participation in the study was on voluntary basis and participant's confidentiality and anonymity was assured.

Conflict of interest

The author declares that there is no conflict of interest.

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References

[1]. World Health Organization, 2020, *Coronavirus disease (COVID-19) pandemic*. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019

[2]. Worldometers. (n.d.). *COVID-19 Coronavirus Pandemic.* Available at: https://www.worldometers.info/coronavirus/

[3]. Nigeria Centre for Disease Control. (n.d.). *COVID-19 Nigeria.* Available at: https://covid19.ncdc.gov.ng/report/

[4]. Al-Hanawi, M. K., Angawi, K., Alshareef, N., Qattan, A. M., Helmy, H. Z., Abudawood, Y., et al, 2020, Knowledge, attitude and practice toward COVID-19 among the public in the kingdom of Saudi Arabia: a cross-sectional study. *Frontiers in Public Health,* 8, 217. doi:10.3389/fpubh.2020.00217

[5]. Sherman, S. M., Smith, L. E., Sim, J., Amlôt, R., Cutts, M., Dasch, H., et al., 2020, COVID-19 vaccination intention in the UK: results from the COVID-19 vaccination acceptability study (CoVAccS), a nationally representative cross-sectional survey. *Human Vaccines & Immunotherapeutics*. doi: 10.1080/21645515.2020.1846397

[6]. WHO director-general's opening remarks at the media briefing on COVID19, 2020, https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020

[7]. Adamawa State Ministry of Health. 2022, COVID-19 Situation report. Serial No. 290, Epi week 02, 13th January 2022.

[8]. Dal-R, Stephens, R., & Sreeharan, N., 2021, Let me choose my COVID-19 vaccine. *European Journal of Internal Medicine.*

[9]. Jones, I., Roy, P., & Sputnik V., 2021, COVID-19 vaccine candidate appears safe and effective. *Lancet,* 397(10275), 642-643.

[10]. Schraer, R.,2021, COVID-19: Sputnik vaccine gives 92% protection in trial. Available from: https://www.bbc.com/news/health-55900622

[11]. Cohen, J., 2021, Dosing debates, transparency issues roil vaccine rollouts. *Science*, 371(6525), 109-110.

[12]. Kaur, S. P., & Gupta, V., 2020, COVID-19 Vaccine: a comprehensive status report. *Virus Research*, 288, Article ID 198114.

[13]. Shaw, J., Stewart, T., Anderson, K. B., et al., 2021, Assessment of US health care personnel (HCP) attitudes towards COVID-19 vaccination in a large University health care system. *Clinical Infectious Diseases.*

[14]. Dror, A. A., Eisenbach, N., Taiber, S., et al., 2020, Vaccine hesitancy: the next challenge in the fight against COVID-19. *European Journal of Epidemiology*, 35(8), 775–779.

[15]. Verger, P., Scronias, D., Dauby, N., et al., 2021, Attitudes of healthcare workers towards COVID-19 vaccination: a survey in France and French-speaking parts of Belgium and Canada, 2020. *Eurosurveillance*, 26(3), 2002047.

[16]. Shekhar, R., Sheikh, A. B., Upadhyay, S., et al., 2021, COVID-19 vaccine acceptance among health care workers in the United States. *Vaccines*, 9(2), 119.

[17]. Roy, B., Kumar, V., & Venkatesh, A., 2020, Health care workers' reluctance to take the Covid-19 vaccine: a consumer-marketing approach to identifying and overcoming hesitancy. *NEJM Catalyst Innovations in Care Delivery*, 1(6).

[18]. Wang, K., Wong, E. L. Y., Ho, K. F., et al., 2020, Intention of nurses to accept coronavirus disease 2019 vaccination and change of intention to accept seasonal influenza vaccination during the coronavirus disease 2019 pandemic: a cross-sectional survey. *Vaccine*, 38(45), 7049–7056.

[19]. Deem, M. J., 2018, Nurses' voices matter in decisions about dismissing vaccine-refusing families. *AJN, American Journal of Nursing*, 118(8), 11.

[20]. Acheampong, A. K., Ganga-Limando, M., Aziato, L., & Ganga-Limando, M., 2020, Perceived enablers of exclusive breastfeeding by teenage mothers in Ghana. *South African Family Practice*, 62(1), a5108.

[21]. Nzaji, M. K., Ngombe, L. K., Mwamba, G. N., et al., 2020, Acceptability of vaccination against COVID-19 among healthcare workers in the Democratic Republic of the Congo. *Pragmatic and Observational Research*, 11, 103–109.

[22]. Garrett, L., 2020, COVID-19: the medium is the message. *Lancet*, 395(10228), 942-943.

[23]. Barry, M., Temsah, M.-H., Alhuzaimi, A., et al., 2020, COVID-19 vaccine confidence and hesitancy among healthcare workers: a cross-sectional survey from a MERS-CoV experienced nation. Available at: https://www.medrxiv.org/content/10.1101/2020.12.09.20246447v1.full

[24]. Kwok, K. O., Li, K. K., Wei, W. I., Tang, K. H., Wong, S. Y. S., & Lee, S. S., 2020, Are we ready when COVID-19 vaccine is available? Study on nurses' vaccine hesitancy in Hong Kong. Available at: https://www.medrxiv.org/content/10.1101/2020.07.17.20156026v1

[25]. Fu, C., Wei, Z., Pei, S., Li, S., Sun, X., & Liu, P., 2020, Acceptance and preference for COVID-19 vaccination in health-care workers (HCWs). Available at: https://www.medrxiv.org/content/10.1101/2020.04.09.20060103v1

[26]. Gagneux-Brunon, A., Detoc, M., Bruel, S., et al., 2021, Intention to get vaccinations against COVID-19 in French health care workers during the first pandemic wave: a cross-sectional survey. *Journal of Hospital Infection*, 108, 168–173.

[27]. Shaw, J., Stewart, T., Anderson, K. B., et al., 2021, assessment of US health care personnel (HCP) attitudes towards COVID-19 vaccination in a large University health care system. *Clinical Infectious Diseases.*

[28]. Zhou, P., Yang, X. L., Wang, X. G., Hu, B., Zhang, L., Zhang, W., et al., 2020, a pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579(7798), 270–273. https://doi.org/10.1038/s41586-020-2012-7

[29]. Roy, B., Kumar, V., & Venkatesh, A., 2020, Health care workers' reluctance to take the Covid-

19 vaccine: a consumer-marketing approach to identifying and overcoming hesitancy. *NEJM Catalyst Innovations in Care Delivery*, 1(6).

[30]. Gadoth, A., Halbrook, M., Martin-Blais, R., et al., 2020, Assessment of COVID-19 vaccine acceptance among healthcare workers in Los Angeles. Available at: https://www.medrxiv.org/content/10.1101/2020.11.18.20234468v1.full

[31]. Shekhar, R., Sheikh, A. B., Upadhyay, S., et al., 2021, COVID-19 vaccine acceptance among health care workers in the United States. *Vaccines*, 9(2), 119.

[32]. Dubey, S., Biswas, P., Ghosh, R., et al, 2020, Psychosocial impact of COVID-19. *Diabetes & Metabolic Syndrome*, 14(January), 779–788. doi:10.1007/s00134-020-05991-x

[33]. Felice, C., Luca, G., Tanna, D., Zanus, G., & Grossi, U., 2020, Impact of COVID-19 outbreak on healthcare workers in Italy: results from a national E-survey. *Journal of Community Health*, 45(0123456789), 675–683. doi:10.1007/s10900-020-00845-5

[34]. Chirico, F., Nucera, G., & Magnavita, N., 2020, COVID-19: protecting healthcare workers is a priority. *Infection Control & Hospital Epidemiology*. doi:10.1017/ice.202.

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Hypertension Prevalence and Associated Risk Factors in Namibia (2010–2022): A Retrospective Analysis of Publicly Available Data

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Abstract

Hypertension remains a leading contributor to cardiovascular morbidity and mortality worldwide, with the most significant burden observed in low- and middle-income countries such as Namibia. Despite multiple national and international surveys, a consolidated analysis of hypertension prevalence and associated factors in Namibia over the past decade has been lacking. This study examined trends in prevalence, associated risk factors, and control levels in Namibia from 2010 to 2022, using publicly available secondary data sources. A retrospective analysis was conducted, drawing on national health surveys, World Health Organization country profiles, Ministry of Health and Social Services reports, and peer-reviewed publications. Data on prevalence, demographic characteristics, and biomedical and behavioral risk factors were extracted, summarized, and analyzed both thematically and quantitatively. Findings indicate that hypertension prevalence in Namibia has shown a gradual upward trend over the study period, with notable regional and sex-specific variations. Advancing age, male sex, urban residence, and higher body mass index emerged as consistent predictors. In contrast, behavioral risk factors, including alcohol consumption, tobacco use, sedentary lifestyle, and high salt intake, were strongly implicated. Furthermore, comorbid conditions such as diabetes mellitus and dyslipidemia substantially increased the risk of hypertension. Gaps in healthcare access, underdiagnosis, and poor treatment coverage further exacerbated the burden, while disparities in data coverage and methodological inconsistencies across sources limited comparability. Overall, the evidence demonstrates a concerning increase in hypertension in Namibia, primarily driven by modifiable lifestyle and structural determinants. Strengthened community-based screening, targeted health promotion, integration of non-communicable disease services into primary healthcare, and improved access to treatment are urgently needed to mitigate this growing public health challenge.

Keywords: *Cardiovascular Disease, Hypertension, Namibia, Non-communicable Diseases, Prevalence, Risk Factors.*

Introduction

Hypertension is a significant public health concern and one of the leading modifiable risk factors for cardiovascular disease (CVD), stroke, and premature mortality worldwide [1]. Globally, it is estimated that over 1.28 billion adults aged 30–79 years have hypertension, with two-thirds living in low- and middle-income countries (LMICs) [2]. Sub-Saharan Africa (SSA) bears a disproportionately high burden, driven by urbanization, dietary changes, sedentary lifestyles, and inadequate health system capacity for early detection and management [3].

In Namibia, hypertension is increasingly recognized as a major contributor to non-communicable disease (NCD) morbidity and mortality. The Namibia Demographic and Health Surveys (NDHS) and World Health Organization (WHO) STEPwise Approach to Surveillance (STEPS) surveys have reported variable prevalence rates, reflecting both

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differences in methodology and the evolving epidemiological landscape [4, 5]. Despite this, there has been limited consolidation of these findings to assess national trends over time and understand key risk factors driving the epidemic.

Hypertension risk factors in Namibia mirror those seen globally, including high salt intake, overweight/obesity, physical inactivity, alcohol use, and tobacco consumption [5, 6]. Regional disparities in prevalence, often linked to socioeconomic status, urbanization, and access to healthcare, further complicate the picture [7]. Addressing these risk factors is crucial to achieving Namibia's NCD strategic targets and the WHO's global goal to reduce hypertension prevalence by 25% by 2025 [8].

Given the scattered nature of the available data, a retrospective synthesis of publicly available sources can provide valuable insights for policymakers and public health practitioners. This study aims to analyze the prevalence of hypertension and its associated risk factors in Namibia between 2010 and 2022, using secondary data from nationally representative surveys, government health reports, and published literature.

Materials and Methods

Study Design

This study employed a retrospective secondary data analysis design, focusing on publicly available datasets and reports documenting hypertension prevalence and associated risk factors in Namibia between 2010 and 2022. The approach was purely observational, analyzing previously published and accessible data without engaging in primary data collection.

Data Sources

Publicly available data were obtained from the following key sources:

1. Namibia Demographic and Health Survey (NDHS) – 2013 and 2018 datasets and final reports.
2. WHO STEPwise Approach to NCD Surveillance (STEPS) reports for Namibia – particularly the 2014 STEPS survey.
3. Ministry of Health and Social Services Annual Health Reports – covering NCD indicators between 2010 and 2022.
4. Peer-reviewed journal articles – accessed through PubMed, Scopus, and Google Scholar using keywords "hypertension", "Namibia", "prevalence", and "risk factors."
5. Global Burden of Disease (GBD) database – for Namibia-specific hypertension estimates.

Inclusion Criteria

Data sources were included if they:

1. Reported hypertension prevalence or associated risk factors in Namibia between 2010 and 2022.
2. Were based on nationally representative samples or covered substantial regional data.
3. Were from recognized institutional, governmental, or peer-reviewed sources.

Exclusion Criteria

Data sources were excluded if they were:

1. Studies limited to specific clinical populations (e.g., hypertensive patients with renal disease only).
2. Unpublished raw datasets without public access or ethical clearance for use.
3. Opinion pieces, editorials, or reports without primary or secondary data.

Data Extraction and Management

Data were extracted into a standardized spreadsheet, capturing the following variables:

1. Year(s) of data collection
2. Sample size and demographic characteristics
3. Hypertension prevalence (overall and stratified by sex, age group, and region)
4. Measurement method (self-reported vs. measured blood pressure)

5. Reported behavioral and biomedical risk factors
6. Source and publication year

Data Analysis

A descriptive synthesis approach was used. Prevalence estimates from multiple years were tabulated to identify trends over time. Differences in prevalence were described across sex, age groups, and regions. Associated risk factors were summarized based on frequency and strength of association reported in the sources. Where available, measures of association (odds ratios, relative risks) were extracted and presented narratively.

Ethical Considerations

This study exclusively utilized publicly available secondary data and did not involve human participants or identifiable personal information. As such, no ethical approval was required from the Ministry of Health and Social Services in Namibia or any institutional review board. All data were used responsibly and interpreted in accordance with established principles of research integrity and confidentiality. Where applicable, the sources of data were acknowledged and cited to ensure transparency and proper attribution.

Results

Hypertension Prevalence in Namibia (2010-2022)

Table 1 presents prevalence estimates from national surveys and subnational studies conducted between 2010 and 2022. Overall, hypertension remains highly prevalent across the Namibian population, with reported rates ranging from 38% in the 2009-2011 Greater Windhoek study [11] to 41% in a 2018-2022 community study in Windhoek [7]. The 2013 Namibia Demographic and Health Survey (NDHS) reported an age-standardized prevalence of 46% among adults aged 35–64 years [4], confirming the national burden of the condition. More recent facility- and community-based studies (2015–2022) indicate similarly high prevalence levels, suggesting limited improvement over the past decade [7, 21].

Associated Risk Factors

Table 2 summarizes key determinants of hypertension identified across the reviewed studies. Advancing age, obesity, and urban residence consistently emerged as significant predictors. Additional factors included diabetes, dyslipidemia, physical inactivity, alcohol use, and high salt consumption. Sex-related differences were occasionally noted, with men showing higher overall prevalence but women more frequently exhibiting obesity-related hypertension. These associations reflect ongoing epidemiological transitions associated with urbanization, lifestyle changes, and increasing metabolic risk in Namibia.

Policy and Programmatic Context

Namibia adopted several NCD strategic plans and aligned with WHO guidelines during the study period; however, implementation has been uneven. Competing priorities from communicable diseases constrained investment in hypertension control [6]. The 2013 NDHS remains the most comprehensive national source, reporting an age-standardized prevalence of 46.0% (95% CI: men, 46.1%; women, 46.0%) [4]. Awareness, treatment, and control levels were low: awareness was 46.6% overall (women, 51.3%; men, 39.4%), treatment rates were 42.1% in women and 33.8% in men, and blood pressure control was achieved in only 18.9% of women and 12.6% of men [4, 7]. Urban settings recorded slightly lower prevalence (~38%), whereas peri-urban data from the Otjomuise community indicated a prevalence of 41% [9]. Overall, older age, urban residency, and overweight/obesity were the most consistent predictors of hypertension across datasets.

Table 1. Reported Hypertension Prevalence in Namibia (2010–2022)

No.	Study/Source*	Year(s)	Setting / Population	Age group	Prevalence (%) **	Notes / Limitations
1	Greater Windhoek study [11]	2009–2011	Urban (Windhoek residents)	35–64 years	38.0	Subnational; modest control (17.8%).
2.	WHO Global Status Report (modelled) [5]	2010	National estimate (modelled)	≥18 years	~28.0	WHO modelled estimate; not based on a measured survey.
3	Namibia DHS [4]	2013	Nationally representative survey	35–64 years	46.0 (Men:46.1, Women: 46.0)	Biomarker-based; significant cascade gaps.
4	WHO STEPS Survey [5]	2016	Nationally representative survey	18–69 years	27.1	Measured BP; broader age group than DHS.
5	Katutura cohort (diabetes clinic) [21]	2015	Facility-based, adults with diabetes	Adults	42.0	High-risk population; not generalizable.
6	Shidhika et al. [27]	2020	Urban (Windhoek, Walvis Bay)	Adults	35 - 45	Subnational, urban
7	MoHSS NCD Report [21]	2020	National estimate	Adults	44	Modelled estimate
8	MoHSS Annual Health Report [6]	2021	National estimate	Adults	~32	Modelled estimate
9	Windhoek peri-urban study [7, 26]	2018–2022	Community-based, peri-urban Windhoek	Adults	41.0	Subnational, peri-urban only.

(*) = References in brackets. (**) = Percentages represent point estimates as reported; some studies did not provide confidence intervals. Differences in methodology, sample size, and age groups limit the direct comparability of results across studies. DHS = Demographic Health Survey; MoHSS = Ministry of Health and Social Services of Namibia; NCD = Non-Communicable Diseases; WHO = World Health Organization.

Hypertension Care Cascade

Table 3 outlines findings related to awareness, treatment, and control among individuals with hypertension. Across all data sources, significant gaps persist throughout the care continuum. The 2013 NDHS indicated that fewer than half of hypertensive adults were aware of their condition, and only a small proportion were adequately treated or controlled [4]. More recent evidence shows minimal progress, with control rates generally below 25% [7]. These results highlight systemic challenges in screening, treatment adherence, and health system follow-up for the management of chronic diseases [25].

Table 2. Reported Factors Associated with Hypertension in Namibia (2010-2022)

No.	Study / Source*	Reported associated factors	Notes/Context
1	Namibia DHS (2013) [4, 10]	Age, adiposity, urban residence	Confirmed via multivariate analysis.
2	Windhoek studies [7, 11]	Male sex, urban setting, obesity, older age, high salt intake	Consistent with SSA risk factor patterns.
3	Katutura diabetic cohort [21]	Diabetes, dyslipidemia, and obesity	Highlights clustering of metabolic risks.
4	WHO / SSA regional analyses [12, 13, 15, 22]	Urbanization, sedentary lifestyles, high salt intake, low SES	Drivers of regional hypertension burden.
5	Multi-country analyses [23, 24]	Low awareness, poor adherence, and weak health system capacity	Explains cascade gaps in Namibia and SSA.

(*) = References in brackets. DHS = Demographic and Health Survey; SSA = Sub-Saharan Africa; WHO = World Health Organization.

Discussion

Principal Findings in Context

Hypertension remains a significant public health burden in Namibia, with low awareness, treatment, and control rates. The 2013 NDHS reported an age-standardized prevalence of 46% among adults aged 35–64 years, with marked gaps in the care cascade [4]. Analyses of the same survey confirmed associations with age, adiposity, and urban residence [10]. Earlier data from Greater Windhoek (2009–2011) showed a high prevalence (38%) and poor control (17.8%) [11]. Together, these findings indicate a substantial and persistent burden from 2010 to 2022, with little evidence of national improvement.

The rising prevalence reflects Namibia's epidemiological transition, disproportionately affecting urban residents, men, and older adults. Similar patterns across SSA highlight the role of urbanization, obesity, sedentary behavior, and high salt intake [12, 13]. Regional disparities within Namibia underscore the influence of social determinants and health-system capacity [14, 15]. The frequent clustering of hypertension with diabetes and dyslipidemia further reflects global evidence of metabolic syndrome as a key driver of cardiovascular risk [2, 14, 16].

Persistent gaps in the care cascade are of particular concern. Large proportions of adults with elevated blood pressure remain undiagnosed, untreated, or poorly controlled, mirroring SSA-wide patterns where fragmented health systems, limited screening, and weak adherence to treatment guidelines hinder progress [12, 17]. Unless addressed, these deficits risk undermining the gains in life expectancy achieved through infectious disease control programs [9].

Table 3. Hypertension awareness, treatment, and control in Namibia (2010–2022)

No	Study/Source*	Year(s)	Population	Awareness (%)	Treatment (%)	Control (%)	Notes/Limitations
1	Greater Windhoek study [11]	2009–2011	Adults 35–64 yrs, urban	42.0	29.0	17.8	Subnational, urban only.
2	Namibia DHS [4]	2013	National, adults 35–64 yrs	40 (Women: 51.3, Men: 39.40)	35 (Women: 42.1, Men: 33.8)	15 (Women: 18.9, Men: 12.6)	First national cascade data: urban-rural and gender gaps.
3	WHO STEPS Survey [5]	2016	National, adults 18–69 yrs	~40.0	30.0	<15.0	Estimates are approximate and represent a broad age group.
4	Katutura diabetic cohort [21]	2015	Facility-based, adults with diabetes	65.0	52.0	25.0	High-risk cohort; not generalizable.
5	Windhoek peri-urban study [7]	2018–2022	Adults, peri-urban Windhoek	43.0	28.0	12.0	Subnational reflects ongoing primary care gaps.

(*) = References in brackets. DHS = Demographic and health survey; WHO = World Health Organization. Percentages represent point estimates as reported; some studies did not provide confidence intervals. Differences in methodology, sample size, and age groups limit the direct comparability of results across studies.

At the policy and programmatic level, Namibia's experience highlights both challenges and opportunities. Strategic plans for NCD prevention exist but have been unevenly implemented, constrained by competing health priorities and limited investment. Evidence from global initiatives such as the WHO HEARTS program shows that standardized treatment protocols, fixed-dose combination therapies, and task-sharing can substantially improve hypertension control in low- and middle-income countries [18, 19]. Namibia's relatively well-resourced health system provides a strong platform for adopting and scaling such approaches, particularly if supported by sustainable financing, robust supply chains, and community engagement.

Overall, Namibia exemplifies the broader SSA hypertension trajectory: a growing NCD burden driven by demographic change and lifestyle shifts, exacerbated by health-system limitations that hinder effective control. Integrating NCD services into primary care and leveraging established platforms such as HIV programs for chronic disease management could offer a pragmatic pathway forward [19, 20]. Without such reforms, the rising prevalence of hypertension is likely to overwhelm health services and exacerbate the cardiovascular disease epidemic in the country.

Comparison with Regional and Global Trends

Namibia's rising hypertension prevalence closely aligns with regional patterns in SSA,

where urbanization, population aging, and increasing obesity have driven a steady rise in blood pressure over the past two decades [12, 13]. Global pooled analyses confirm that SSA continues to record some of the highest mean blood pressures and among the lowest levels of hypertension control worldwide [13], [15]. Long-term body mass index (BMI) trends, which show consistent increases across both sexes in Southern Africa, further compound Namibia's risk profile and reinforce the broader epidemiological transition [21].

The upward trajectory observed in Namibia between 2010 and 2022 mirrors findings from other SSA countries. National surveys in South Africa, Ghana, and Nigeria, for example, consistently report prevalence rates exceeding 30%, with men, urban residents, and individuals living with diabetes or obesity disproportionately affected [15, 22]. These parallels suggest that Namibia's challenges are not unique but part of a continent-wide epidemiologic shift where cardiometabolic risks are increasing as health systems struggle to adapt.

Care cascade patterns also demonstrate striking similarities. Across SSA, fewer than 40% of hypertensive adults are aware of their condition, and less than 15% achieve adequate control [12, 23]. Namibia's gaps in awareness, treatment, and control—as documented in the 2013 Demographic and Health Survey and other studies [4, 7, 9]—mirror this regional picture. System-level weaknesses, including fragmented screening, supply chain disruptions, and a lack of standardized treatment protocols, are recurring challenges across the region [24].

Globally, Namibia's trajectory reflects the divergent trends between high-income countries (HICs) and low- and LMICs. While HICs such as Canada and South Korea report control rates above 60% following decades of investment in standardized protocols and population-level interventions [25], many LMICs, including those in SSA, continue to face worsening hypertension burdens [21]. This places Namibia squarely within the global epidemiological transition, where the burden of hypertension and related non-communicable diseases is shifting toward LMICs with limited healthcare capacity.

Taken together, Namibia's experience underscores both the shared regional challenges of SSA and the widening global inequities in hypertension outcomes. This highlights an urgent need to adapt successful strategies from HICs—such as standardized treatment algorithms, task-shifting, and community-based interventions—to the local Namibian health system, ensuring scalability and sustainability.

Risk Factors and Social Patterning

NDHS-based analyses consistently demonstrate that older age, overweight/obesity, and urban residence are strong predictors of hypertension in Namibia, with some sex-specific patterns whereby men exhibit higher prevalence. However, women often show greater awareness and treatment [4]. Earlier urban studies from Windhoek have corroborated these associations, highlighting the role of adiposity indicators, such as BMI and waist circumference, in elevating blood pressure [10].

Although this retrospective review did not pool regression coefficients across sources, the direction and magnitude of associations align with those reported across SSA. Major behavioral risk factors include high salt intake, diets low in fruit and vegetable consumption, physical inactivity, tobacco smoking, and harmful alcohol use, which together account for much of the modifiable risk burden [12, 13]. In Namibia, high salt consumption has been documented in household dietary surveys, and sedentary behavior is particularly pronounced in urban and peri-urban communities undergoing rapid lifestyle transitions [4, 5].

Significantly, comorbidities such as diabetes and dyslipidemia amplify cardiovascular risk in

individuals with hypertension, reflecting the clustering of NCD risk factors often described as the metabolic syndrome [2, 16]. These biomedical risks intersect with social determinants of health, including education, employment, and household wealth, shaping both prevalence and outcomes. Couple-level analyses using the 2013 NDHS further revealed within-household clustering of hypertension, awareness, and treatment outcomes, suggesting that shared environments and behaviors such as diet, alcohol consumption, or healthcare-seeking practices play a significant role in hypertension risk [25].

Together, these findings underscore that hypertension in Namibia is driven not only by individual-level behaviors and biology but also by household and community contexts, highlighting the need for multisectoral prevention approaches that address both lifestyle modification and the broader social patterning of risk.

Care Cascade and Health-system Implications

Gaps along the hypertension care cascade—spanning screening and awareness, initiation of treatment, and long-term control—remain the most salient programmatic signals for Namibia. Analyses from the 2013 NDHS revealed that large proportions of adults with elevated blood pressure were unaware of their condition. Among those diagnosed and initiated on medication, control rates remained modest [4]. Similar findings are echoed in other SSA contexts, where fewer than 40% of hypertensive adults are aware of their status, under 30% receive treatment, and fewer than 15% achieve adequate control [3, 12, 21].

These care gaps reflect systemic challenges. First, fragmented screening and opportunistic detection mean that many individuals are diagnosed only after presenting with complications, undermining opportunities for early intervention [21, 22]. Second, variability in clinical guidelines and treatment protocols across facilities leads to inconsistencies in management and follow-up [18]. Third, supply chain interruptions and limited access to affordable antihypertensive medicines remain common in Namibia and across SSA, restricting treatment adherence [26]. Finally, weak longitudinal information systems hinder monitoring of patient outcomes and system performance, with facility-based data often incomplete or not linked to national health information platforms [21, 25].

Evidence from WHO's HEARTS technical package suggests that these gaps are not insurmountable. Programs integrating standardized treatment protocols, reliable medicine supply chains, use of fixed-dose combinations, task sharing with nurses and community health workers, and cohort monitoring systems have demonstrated substantial improvements in hypertension control in diverse LMIC contexts [26, 27]. For instance, large-scale implementation in countries such as India and Mexico has shown that population-level blood pressure control can be significantly improved within a few years of programmatic alignment [28, 29].

For Namibia, these lessons are particularly salient. Embedding routine screening into primary care visits, integrating hypertension management into existing NCD and HIV platforms, ensuring consistent drug availability, and leveraging community-based models of care could help close current gaps. Strengthening the care cascade is essential not only for reducing hypertension-related morbidity and mortality but also for advancing broader universal health coverage (UHC) goals nationwide.

Policy Environment, 2010–2022

Namibia's policy trajectory for hypertension control over the past decade reflects a growing national recognition of NCDs as a major public health threat. The National Multisectoral Strategic Plan for the Prevention and Control of NCDs (2017/18–2021/22) emphasized

reducing the burden of CVD and its risk factors through prevention, early detection, and integrated management [29]. This strategic orientation aligned with continental initiatives, such as the Pan-African Society of Cardiology (PASCAR) roadmap, which outlined ambitious targets to achieve 25% hypertension control across Africa by 2025 through the strengthening of primary care, standardization of treatment protocols, and expansion of access to essential medicines [30].

Despite these policy commitments, several challenges have constrained implementation. Most notably, the absence of a nationally representative biomarker survey after the 2013 NDHS has limited the ability to track progress against strategic goals and monitor population-level blood pressure trends. Without timely, population-based surveillance, it is challenging to evaluate whether Namibia's policy initiatives have led to improved detection, treatment, and control. This data gap mirrors broader regional challenges, where routine NCD surveillance systems remain underdeveloped [6, 31].

On the global stage, evolving evidence has also informed policy guidance. The 2021 WHO guideline on the pharmacological treatment of hypertension recommended pragmatic blood pressure thresholds for treatment initiation [32]. It emphasized simple, standardized regimens — especially the use of fixed-dose, single-pill combinations — to improve adherence and scalability in resource-limited settings [32]. For Namibia, adoption and operationalization of these guidelines into national treatment protocols would represent a critical step toward closing the care gaps identified in the 2013 NDHS and subsequent facility-level studies.

Equally important are enabling systems and financing mechanisms. The WHO "Best Buys" for NCDs emphasize the importance of population-level policies, including salt reduction, alcohol regulation, tobacco taxation, and promoting healthy diets and physical activity, alongside clinical strategies [33]. Namibia's NCD strategy acknowledged these priorities, but operationalization has been uneven due to resource constraints and competing health priorities such as HIV and tuberculosis [33], [34]. Sustained political commitment, intersectoral coordination, and investment in both prevention and health-system strengthening remain necessary to translate policy frameworks into tangible improvements in hypertension outcomes.

Public Health Priorities

The evidence synthesized in this review highlights three interlinked public health priorities for Namibia to address the rising burden of hypertension and its cardiovascular sequelae.

First, population-level prevention strategies must remain central to any national response. Reducing dietary salt intake, promoting healthy diets rich in fruits and vegetables, encouraging physical activity, and implementing strong policies on tobacco and alcohol control are all cost-effective interventions recommended by the WHO "Best Buys" for NCD prevention [33]. The Southern African Development Community (SADC) has also endorsed regional frameworks that emphasize lifestyle interventions, food labeling, and fiscal measures such as sugar and alcohol taxes [35]. Evidence from successful salt reduction programs in South Africa and tobacco taxation in Botswana and Namibia illustrates the feasibility of such policies in the sub-region [36, 37]. These interventions shift the overall population risk distribution and have the potential for substantial long-term impact on CVD outcomes.

Second, scaling up hypertension control within primary health care is essential. The WHO HEARTS technical package provides a structured framework that has shown success in multiple LMICs, combining standardized treatment protocols, quality-assured BP measurement, task-sharing, longitudinal cohort monitoring, and use of fixed-dose combinations [19, 38, 39]. Adapting these strategies to

Namibia's primary care settings — leveraging existing HIV/NCD integration platforms — can deliver efficient and equitable coverage. At the same time, cohort dashboards and routine audit cycles support continuous quality improvement.

Third, strengthening health information systems is crucial to address current evidence gaps. Namibia's last nationally representative biomarker survey was in 2013, leaving a decade-long void in population-level hypertension data [4]. Establishing robust routine hypertension registers and embedding NCD indicators into district health information systems would enable facility-level tracking of detection, treatment, and control. Complementing these with periodic national STEPS surveys and DHS updates will provide the longitudinal data necessary for accountability and policy recalibration [5, 27].

Together, these priorities emphasize a dual approach: preventing incident hypertension through upstream risk-reduction policies while strengthening the health system's capacity to detect, treat, and control existing hypertension. Addressing both levels is vital if Namibia is to avert the projected rise in CVD morbidity and mortality.

Methodological Considerations

Several methodological limitations temper the interpretation of the evidence. First, differences in sampling frames (national vs. urban, restricted vs. broad age ranges) reduce comparability. The NDHS included adults aged 35–64 years, whereas urban studies, such as those in Windhoek, covered all adults aged 18 years and above [4, 40]. Second, measurement protocols varied, with some surveys relying on single-occasion readings, inconsistent cuff sizing, or differing thresholds, introducing risks of misclassification [57, 58]. Third, the lack of a repeat national biomarker survey after 2013 remains a major gap, limiting temporal inference.

Nevertheless, triangulation across sources supports the robustness of conclusions. The high prevalence in the 2013 NDHS is consistent with contemporaneous urban estimates and regional meta-analyses [12, 24]. Moreover, consistent identification of key demographic and behavioral risk factors across datasets strengthens internal validity. Future research should prioritize harmonized protocols; conduct repeat national biomarker surveys and integrate electronic facility data into national reporting to facilitate trend monitoring and informed policy evaluation.

Future Research

Several priorities for future research emerge from this review. First, Namibia urgently requires a new nationally representative survey, ideally following the WHO STEPS or DHS model, to capture all adults aged ≥18 years using standardized BP measurement protocols and incorporating biomarkers such as fasting glucose and lipids. The absence of such data since the 2013 NDHS [4] limits the ability to monitor recent trends, whereas similar surveys across SSA have proven critical for policy planning [13, 22].

Second, facility-level cohort data are needed to track hypertension treatment and control over time. Such longitudinal evidence would provide granular insights into program performance and enable benchmarking across districts. Lessons from South Africa, Ghana, and Kenya demonstrate how facility cohorts can expose gaps in retention and adherence [24, 25].

Third, implementation research should evaluate Namibia's adaptation of WHO HEARTS-aligned approaches. Evidence from LMICs shows that standardized protocols, fixed-dose combinations, task-sharing with non-physician providers, and digital health registries can improve hypertension control at scale [20, 38]. Evaluating the feasibility, acceptability, and effectiveness of interventions

within Namibia's primary care system is crucial.

Finally, equity-focused analyses are needed to identify geographic, socioeconomic, and gender-based disparities in detection, treatment, and control. Consistent evidence across SSA highlights gradients by wealth, residence, and education [11, 15, 23]. Documenting such inequities in Namibia would help tailor interventions to reach the most vulnerable groups.

Collectively, these research directions would strengthen the evidence base for programmatic action, enhance accountability, and accelerate Namibia's progress toward achieving equitable control of NCDs.

Conclusion

This study highlights the growing burden of hypertension in Namibia, reflecting trends observed across sub-Saharan Africa. The findings demonstrate that hypertension is highly prevalent and strongly associated with both modifiable and non-modifiable factors, including age, sex, obesity, dietary habits, physical inactivity, alcohol consumption, and socioeconomic status. These results underscore the urgent need for comprehensive strategies that integrate early detection, community-based screening, health education, and lifestyle interventions into the primary health care system.

Addressing the high prevalence of hypertension requires a dual approach: strengthening health system capacity for diagnosis and long-term management, while simultaneously addressing upstream social determinants such as urbanization, dietary transitions, and inequitable access to preventive health services. Targeted interventions that prioritize high-risk groups, particularly older adults, individuals with obesity, and those with limited health literacy, are essential to reducing morbidity and mortality linked to cardiovascular disease.

Ultimately, mitigating the burden of hypertension in Namibia will require strong multisectoral collaboration, robust surveillance systems, and the promotion of healthy lifestyle practices. By implementing evidence-based policies and scaling up prevention and control programs, Namibia can move toward achieving its national targets for non-communicable diseases and contribute to global efforts aligned with the Sustainable Development Goals.

Data Availability

All data used in this review are from publicly available secondary sources, including the Namibia Demographic and Health Survey, the WHO Global Health Observatory, and peer-reviewed publications as cited. Relevant datasets and reports can be accessed through the Ministry of Health and Social Services of Namibia, the WHO data repository, and journal websites, as cited in the references.

Author Contributions

The author conceived the study, conducted the literature search, synthesized the evidence, and drafted the manuscript. He approved the final version and is accountable for all aspects of the work.

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Conflict of Interest

The author declares that there are no competing interests.

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References

[1]. World Health Organization, 2023, *Hypertension:* WHO's 2023 global report on hypertension (and HEARTS technical package resources). Geneva: WHO. https://www.who.int/teams/noncommunicable-diseases/hypertension-report. World Health Organization

[2]. Mills, K. T., Stefanescu, A., and He, J., 2020, The global epidemiology of hypertension. *Nature Reviews Nephrology, 16*(4), 223–237, https://doi.org/10.1038/s41581-019-0244-2

[3]. Adeloye, D., Basquill, C., Aderemi, A. V., Thompson, J. Y., and Obi, F. A., 2021, An estimate of the prevalence of hypertension in Africa: A systematic analysis. *Journal of Hypertension, 39*(2), 210–222, https://doi.org/10.1097/HJH.0000000000002664

[4]. Ministry of Health and Social Services (MoHSS) and ICF International, 2014, Namibia Demographic and Health Survey *2013*. Windhoek, Namibia, and Rockville, MD, *USA: MoHSS and ICF International*.

[5]. World Health Organization (WHO), 2018, STEPwise approach to NCD risk factor surveillance: Namibia country report. *Geneva: WHO*.

[6]. Ministry of Health and Social Services (MoHSS), 2021, Annual Health Sector Performance Report 2020/21. *Windhoek: Government of Namibia*.

[7]. Peer, N., Kengne, A. P., Motala, A. A., and Ojemeni, M., 2018, Prevalence and predictors of hypertension in Namibia: A national-level cross-sectional study. *PLoS ONE, 13*(9), e0204344, https://doi.org/10.1371/journal.pone.0204344

[8]. Dzudie, A., Rayner, B., Ojji, D., Damasceno, A., Sliwa, K., Mayosi, B., and Sani, M., 2017, Roadmap to achieve 25% hypertension control in Africa by 2025. *Cardiovascular Journal of Africa, 28*(4), 262–272, https://doi.org/10.5830/CVJA-2017-040

[9]. Matengu, K., and Kazembe, L., 2025, Prevalence of hypertension in community members in a low-income community in Windhoek, Namibia. *African Journal of Primary Health Care & Family Medicine, (in press)*.

[10]. Craig, A. T., Gage, A., and Thomas, L. S., 2018, Prevalence and predictors of hypertension in Namibia: A national-level cross-sectional study. *PLOS ONE, 13*(9), e0204344, https://doi.org/10.1371/journal.pone.0204344

[11]. Peer, N., Kengne, A. P., Motala, A. A., and Ojemeni, M., 2012, Hypertension in sub-Saharan Africa: Cross-sectional surveys in four rural and urban communities. *PLoS ONE, 7*(3), e32638, https://doi.org/10.1371/journal.pone.0032638

[12]. Ataklte, F., Erqou, S., Kaptoge, S., Taye, B., Echouffo-Tcheugui, J. B., and Kengne, A. P., 2015, Burden of undiagnosed hypertension in sub-Saharan Africa: A systematic review and meta-analysis. *Hypertension, 65*(2), 291–298, https://doi.org/10.1161/HYPERTENSIONAHA.114.04394

[13]. NCD Risk Factor Collaboration (NCD-RisC), 2021, Worldwide prevalence, detection, treatment, and control of hypertension, 1990–2019. *The Lancet, 398*(10304), 957–980, https://doi.org/10.1016/S0140-6736(21)01330-1

[14]. NCD Risk Factor Collaboration (NCD-RisC), 2021, Long-term and recent trends in hypertension awareness, treatment, and control in 12 high-income countries: An analysis of 123 nationally representative surveys. *The Lancet, 398*(10304), 9969, https://doi.org/10.1016/S0140-6736(21)01330-1

[15]. Addo, J., Smeeth, L., and Leon, D. A., 2007, Hypertension in sub-Saharan Africa: A systematic review. *Hypertension, 50*(6), 1012–1018, https://doi.org/10.1161/HYPERTENSIONAHA.107.093336

[16]. Kaze, A. D., Schutte, A. E., Erqou, S., and Kengne, A. P., 2017, Prevalence of hypertension in older people in Africa: A systematic review and meta-analysis. *Journal of Hypertension, 35*(7), 1345–1352, https://doi.org/10.1097/HJH.0000000000001345

[17]. Bigna, J. J., and Noubiap, J. J., 2019, The rising burden of hypertension in sub-Saharan Africa: A call to action. *Journal of Clinical Hypertension, 21*(4), 564–567, https://doi.org/10.1111/jch.13518

[18]. Jaffe, M. G., Frieden, T. R., Ordunez, P., Silva, L. C. E., and Campbell, N. R. C., 2023, Standardized hypertension treatment to reduce cardiovascular disease worldwide. *The Lancet, 401*(10378), 1205–1214, https://doi.org/10.1016/S0140-6736(23)00457-1

[19]. World Health Organization (WHO), 2023, HEARTS technical package for cardiovascular disease management in primary health care. *Geneva: WHO*.

[20]. Rabkin, M., and El-Sadr, W. M., 2011, Why reinvent the wheel? Leveraging the lessons of HIV scale-up to confront non-communicable diseases. *Global Public Health, 6*(3), 247–256, https://doi.org/10.1080/17441692.2011.552067

[21]. Zhou, B., Perel, P., Mensah, G. A., and Ezzati, M., 2021, Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. *Nature Reviews Cardiology, 18*(11), 785–802, https://doi.org/10.1038/s41569-021-00559-8

[22]. Awuah, R. B., Anarfi, J. K., Agyemang, C., Ogedegbe, G., and Aikins, A. D. G., 2019, Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. *Journal of Hypertension, 37*(6), 1209–1217, https://doi.org/10.1097/HJH.0000000000002016

[23]. Noubiap, J. J., Bigna, J. J., Nansseu, J. R., Nyaga, U. F., Balti, E. V., Echouffo-Tcheugui, J. B., and Kengne, A. P., 2019, Prevalence of elevated blood pressure in children and adolescents in Africa: A systematic review and meta-analysis. *The Lancet Public Health, 4*(8), e375–e386, https://doi.org/10.1016/S2468-2667(19)30115-3

[24]. Adeloye, D., and Basquill, C., 2014, Estimating the prevalence and awareness rates of hypertension in Africa: A systematic analysis. *PLoS One, 9*(8), e104300, https://doi.org/10.1371/journal.pone.0104300

[25]. World Health Organization (WHO), 2021, Guideline for the pharmacological treatment of hypertension in adults. *Geneva: WHO*. https://www.who.int/publications/i/item/9789240033986

[26]. Iipinge, S. N., Pretorius, L., and Nampala, P., 2018, Hypertension prevalence and risk factors in peri-urban Namibia. *African Journal of Primary Health Care & Family Medicine, 10*(1), e1–e8, https://doi.org/10.4102/phcfm.v10i1.1705

[27]. Shidhika, O. M., Iipinge, S. N., and Kalomo, M. H., 2020, Risk factors and health-seeking behaviour of hypertensive patients in Namibia: A cross-sectional study. *African Journal of Primary Health Care & Family Medicine, 12*(1), e1–e7, https://doi.org/10.4102/phcfm.v12i1.2240

[28]. Jafar, T. H., Gandhi, M., Hotu, S., and Mendis, S., 2023, Evaluation of the WHO-HEARTS hypertension control package in primary care. *Heart, 110*(17), 1090–1096, https://doi.org/10.1136/heartjnl-2023-322111

[29]. Frieden, T. R., and Jaffe, M. G., 2018, Saving 100 million lives by improving global treatment of hypertension and reducing cardiovascular disease risk factors. *Journal of Clinical Hypertension, 20*(2), 208–211.

[30]. Ministry of Health and Social Services (MoHSS), 2017, National Multisectoral Strategic Plan for Prevention and Control of Non-Communicable Diseases *2017/18–2021/22*. *Windhoek: MoHSS*.

[31]. Ezzati, M., Pearson-Stuttard, J., Bennett, J. E., and Mathers, C. D., 2021, Acting on non-communicable diseases in low- and middle-income tropical countries. *Nature Reviews Cardiology, 18*(9), 639–653, https://doi.org/10.1038/s41569-021-00552-8

[32]. World Health Organization (WHO), 2021, Hypertension fact sheet. *Geneva: WHO*. https://www.who.int/news-room/fact-sheets/detail/hypertension

[33]. World Health Organisation (WHO), 2017, Best buys and other recommended interventions for the prevention and control of non-communicable diseases. *Geneva: WHO*.

[34]. Ministry of Health and Social Services, 2016, National Strategic Plan for the Prevention and Control of Non-Communicable Diseases *2016–2020*. *Windhoek: MoHSS*.

[35]. Southern African Development Community (SADC), 2019, SADC Strategy for the Prevention and Control of Non-Communicable Diseases *2020–2030*. *Gaborone: SADC Secretariat*.

[36]. Charlton, K., Ware, L. J., Menyanu, E., Biritwum, R. B., Naidoo, N., Pieterse, C., ... and Kowal, P., 2016, Leveraging ongoing research to evaluate the health impacts of South Africa's salt reduction strategy: A prospective cohort study. *BMJ Open,* *6*(11), e013316, https://doi.org/10.1136/bmjopen-2016-013316

[37]. Bloomfield, G. S., et al., 2016, Blood pressure screening and treatment among rural and urban residents in sub-Saharan Africa: A systematic review. *Journal of Clinical Hypertension, 18*(9), 889–894, https://doi.org/10.1111/jch.12809

[38]. Jaffe, M. G., Ordunez, P., Becerra, F., and Campbell, N. R. C., 2023, Implementation of Global HEARTS hypertension control programs in low- and middle-income countries. *Journal of the American College of Cardiology, 82*(13), 1274–1288, https://doi.org/10.1016/j.jacc.2023.08.043

[39]. Ordunez, P., Campbell, N. R. C., and Jaffe, M. G., 2023, Improving hypertension control at scale: Lessons from the HEARTS initiative. *The Lancet Regional Health – Americas, 19*, 100421, https://doi.org/10.1016/j.lana.2023.100421

[40]. Ordunez, P., Campbell, N. R. C., and Jaffe, M. G., 2023, Scaling up effective treatment of hypertension—A call to action. *Hypertension, 80*(3), 528–536, https://doi.org/10.1161/HYPERTENSIONAHA.122.20408

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Beyond the Numbers, Unpacking the Challenges: Adherence and Retention among Young Adults Living with HIV in Eswatini

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Abstract

This study investigates adherence to Antiretroviral Therapy (ART) and retention in care among HIV-positive young adults aged 18–24 years in Eswatini, a country with one of the highest HIV prevalence rates globally. Using a mixed-methods approach, quantitative data were collected from 161 participants and complemented with qualitative interviews to explore personal and contextual experiences. The quantitative findings revealed that mean adherence to ART was 96.3% (±6.1 SD), with 77.6% of participants maintaining high adherence levels of 95–100%. Viral suppression below 50 copies/mL was achieved in 85.7% of the study population, while retention in care was 82.6%. Although these results are encouraging, they fall short of UNAIDS 95-95-95 targets, highlighting persistent gaps. The qualitative findings provided deeper insights into lived realities. Motivators of adherence included family support, encouragement from healthcare providers, personal motivation to remain healthy, and peer encouragement. Barriers included stigma, fear of disclosure, financial constraints, treatment fatigue, and negative experiences with healthcare staff. Benefits of adherence included improved health, strength to perform daily tasks, and reduced risk of HIV transmission. Integrating the findings underscores the multifaceted nature of ART adherence, influenced by individual, social, economic, and systemic factors. The study concludes that addressing adherence challenges requires youth-centered interventions, stigma reduction, economic empowerment, and healthcare system strengthening. These results provide evidence to guide Eswatini's HIV response and contribute to the global goal of achieving sustained epidemic control.

Keywords: *Adherence, Eswatini, HIV, Retention, Young Adult.*

Introduction

HIV/AIDS continues to be a profound global health challenge, with a particularly significant impact on young adults aged 15-24 years. Effective Antiretroviral Therapy (ART) is crucial for viral suppression, improving health, and prolonging the lives of adolescents and youths living with HIV/AIDS, thereby decreasing related morbidity and mortality [1, 13]. Globally, substantial progress has been made in HIV prevention and care, with approximately 76% of people living with HIV (PLHIV) receiving ART in 2022, and 71% achieving viral suppression. This access to ART has prevented about 21 million HIV and AIDS-related deaths over the past three decades [2, 16, 17].

Despite this progress, a considerable number of new HIV infections continue to be a concern, especially among adolescents and young people (AYP) [3]. In 2022, approximately 27% of the 1.3 million new HIV cases worldwide occurred in individuals aged 15 to 24 years [2]. Adolescent girls and young women (AGYW) accounted for sixty-six percent of all new infections among adults aged 15 years and older [2].

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In sub-Saharan Africa (SSA), AYP are disproportionately affected by HIV due to a combination of biological, socioeconomic, and cultural factors. These factors include economic marginalization leading to transactional or concurrent sexual relationships, engagement in illicit drug use, and barriers to accessing HIV prevention and treatment services due to discrimination and negative attitudes from healthcare workers [4, 12]. Furthermore, HIV infection among AYP carries significant societal implications, including the potential for transmission to older sexual partners and vertical transmission to unborn babies if pregnant or breastfeeding [4].

Eswatini, a country in Southern Africa with a population of 1.2 million, has one of the highest HIV prevalence rates in the region. While the prevalence was 29.7% in 2017, it decreased to 25.9% by 2022 due to effective HIV management, which necessitates strict adherence to ART and consistent engagement in healthcare services [2]. However, the implementation of ART among adolescents and youths aged 10–24 years faces significant challenges in resource-limited settings [2]. Despite an ART coverage rate of 91%, viral suppression remains at 73.1%, reflecting challenges in sustaining optimal adherence and retention in care [21].

A critical challenge in managing HIV among young adults is the need to achieve and maintain high levels of medication adherence to fully realize the benefits of ART. Poor adherence leads to viral replication, disease progression, and the development of drug resistance, negatively impacting health outcomes [1]. The Ministry of Health in Eswatini, in its 2022 Integrated HIV Management Guidelines, recognizes the parallels between the maturation of adolescents into adults and the transition from pediatric to adult HIV programs [5]. As adolescents living with HIV mature, they are required to transfer to adult care settings and assume greater responsibility for their health and HIV management. This population is diverse, comprising both perinatally and horizontally infected adolescents [5, 20].

Transition, defined as the purposeful, planned movement of adolescents and young adults with chronic medical conditions from child-centered to adult-oriented care systems, and typically occurs between 18 and 24 years of age, though early preparation is continuous from ages 10-19 years with multidisciplinary support. Adolescents living with HIV encounter unique challenges during this transition, including stigma, the need to disclose their HIV status to friends, family, and adult care providers, and potential neurocognitive impairments and mental health problems associated with HIV [11, 15]. Unsuccessful transition can manifest as poor ART adherence, viral rebound, increased rates of loss to follow-up (LTFU), lower retention in care, and detectable viral loads. These outcomes subsequently lead to weakened immune systems, increased morbidity and mortality, and the potential for developing drug resistance [5].

Adolescents and Youth Living with HIV (AYLHIV) experience significant disparities across the HIV care continuum, with higher rates of attrition from care and increased HIV-related mortality compared to other age groups. HIV/AIDS remains among the top five leading causes of death for adolescents in Africa [9]. Barriers to quality health services for AYLHIV include inadequate access to health care teams trained in adolescent- and youth-friendly services, non-tailored health information, difficulties navigating adult-oriented health systems, legal requirements for parental or caregiver consent, and challenges with service costs. While a successful transition is vital for optimal health outcomes, facilities often lack the necessary infrastructure, human resources (with appropriate knowledge and skills), and supportive environments [6]. Existing research in Eswatini has already identified poor ART outcomes, including low viral load suppression and suboptimal adherence, among adolescents

[8]. While these studies often focus on 10-19, the transition into young adulthood (18-24) presents unique challenges that may differ or intensify.

Near perfect adherence to ART, maintained throughout one's lifetime, is essential for its long-term success. ART adherence is defined as the extent to which an individual takes medication as prescribed regarding timing, dosing, and consistency. A strict adherence level of ≥95% is suggested for ART to be effective and prevent the emergence of resistant strains. Failure to achieve this level results in accelerated progression of HIV to AIDS, increased morbidity and mortality, and resistance to ART. Non-adherence can lead to regimen failure, immune suppression, and emergence of resistant viral strains, limited future treatment options, and higher treatment costs. Health behaviors such as poor retention in HIV medical care and non-adherence to ART pose major challenges to reducing new HIV infections, addressing health disparities, and improving health outcomes. Therefore, understanding the barriers and facilitators to these behaviors is critical for developing effective strategies to improve retention and adherence [6, 14, 18].

Objectives

The overall aim of this study was to investigate the variables that affect HIV-positive young adults in Eswatini, aged 18 to 24 years, in terms of their adherence to antiretroviral therapy (ART) and retention in care. The study seeks to comprehend the difficulties this population encounters in adhering to their treatment plans and continuing to utilize healthcare services. The research examined various social, psychological, and structural factors to improve treatment adherence and retention in care, ultimately enhancing health outcomes for young adults living with HIV.

The primary research objectives are to:

1. Identify the socio-demographic characteristics of HIV-positive young adults aged 18-24 years in all four regions of Eswatini.
2. Assess the level of adherence to antiretroviral therapy (ART) among this young population.
3. Explore the factors that influence adherence to ART among HIV-positive young adults in all the regions.
4. Investigate the challenges faced by HIV-positive young adults in remaining engaged in healthcare services in all the regions.
5. Investigate the social, psychological, and structural factors that impact retention in care in all the regions.

The secondary research objective is to:

Propose recommendations and strategies to improve treatment adherence and retention in care for HIV-positive young adults to policymakers, managers, and other key stakeholders.

Materials and Methods

Study Design

This study employed a mixed-methods approach to provide a comprehensive understanding of ART adherence and retention in care among HIV-positive young adults aged 18-24 years in Eswatini. This design integrates both quantitative and qualitative research methods, allowing for the triangulation of numerical data and in-depth insights from participants [7]. The quantitative component assessed the level of adherence and identify socio-demographic characteristics, while the qualitative component explored the factors influencing adherence, challenges faced in healthcare engagement, and social, psychological, and structural impacts on retention in care.

Study Setting

The study was strategically conducted in the ART departments of four hospitals, ensuring representation from each of Eswatini's four

regions: Mbabane Government Hospital, Raleigh Fitkin Memorial Hospital, Hlathikhulu Government Hospital, and Good Shepherd Mission Hospital. This selection included both government-owned (Mbabane and Hlathikhulu) and mission-owned (Raleigh Fitkin Memorial and Good Shepherd Mission) facilities, situated in urban and semi-urban settings. This diverse geographical and institutional representation aimed to capture a broad range of experiences from populations encompassing rural, peri-urban, and urban backgrounds.

Study Population

The study population comprised HIV-positive young adults aged 18-24 years who had been receiving ART for a minimum period of 12 months. Specific inclusion criteria ensured participant eligibility: individuals had to be HIV positive and on ART, aged between 18 and 24 years, have been on ART for 12 months or more, and be residing in Eswatini. The criteria also included both those who had never been lost to follow-up (LTFU) on ART and those who had been previously LTFU but were registered in the ART back-to-care register. Exclusion criteria encompassed individuals who were HIV negative, HIV positive but not on ART, those on ART for less than 12 months, individuals under 18 years of age, or those unwilling to participate or unable to provide informed consent.

Sample Size Calculation

The sample size target was determined using a mathematical formula to achieve a desired level of statistical accuracy and precision. Based on the Eswatini SHIMS3 report, the estimated proportions of young adults aged 18-24 years living with HIV in the four regions are: Hhohho 21.6%, Manzini 26%, Lubombo 25.3%, and Shiselweni 26% [10].

Taking the average prevalence ($p \approx 0.247$), the formula applied was:

$$n = \frac{Z^2 \times p \times (1-p)}{E^2}$$

Where n is the required sample size, Z is the Z-score corresponding to the chosen confidence level, p is the estimated average prevalence (in this case, the mean of the four regions), and E is the desired margin of error. For this study, a 95% confidence level was selected (corresponding to a Z-score of 1.96), with a 5% margin of error. Based on these parameters, the minimum sample size required was calculated to be approximately 288 participants.

Data Collection

Quantitative data was collected through medical record abstraction from sources such as chronic care files (CCFs), appointment registers, and the back-to-care register. This allowed for the collection of objective information related to ART adherence and retention. Qualitative data was collected through face-to-face interviews with ART patients and healthcare workers. Interviews were conducted in a private space to ensure confidentiality and minimize disturbances. Audio recording devices were used to capture the interviews, with explicit permission sought from participants through written informed consent. The researcher also took notes on a notepad during the interviews, observing and jotting down non-verbal cues such as frowning, smiling, or signs of worry. Each interview lasted approximately 45 minutes.

Data Management and Handling

Completed data collection tools were checked for completeness and stored securely in a folder. Audio transcripts from the interviews were transcribed verbatim by the researcher. Interviews conducted in SiSwati were translated verbatim into English. Verbal notes and observations on non-verbal cues were also typed up, with each interview transcribed separately. All information was saved in password-protected files to ensure confidentiality.

Statistical Analysis

Quantitative data were analyzed using SPSS version 26.0. Descriptive statistics were used to summarize socio-demographic characteristics and adherence levels. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as means and standard deviations. Bivariate analysis was conducted to examine associations between variables using chi-square tests and t-tests as appropriate. A p-value of <0.05 was considered statistically significant.

Qualitative data were analyzed using thematic analysis. Transcripts were read repeatedly to achieve familiarity with the data. Initial codes were generated and then organized into potential themes. These themes were reviewed, refined, and named to ensure they accurately represented the data. The Socio-Ecological Model was used as a framework to organize the themes at individual, interpersonal, community, and societal levels.

Ethical Considerations

Ethical approval was obtained from the Texila American University Ethics Review Board (Reference No: TAU/IRB2024/BC/2895) and the Eswatini Health and Human Research Review Board (Reference No: EHHRRB 063/2024). Written informed consent was obtained from all participants before data collection. Participants were informed of their right to withdraw from the study at any time without any negative consequences to their healthcare. All data were anonymized to protect participant confidentiality.

Results

Socio-Demographic Characteristics

A total of 161 HIV-positive young adults aged 18-24 years participated in the quantitative component of the study.

The socio-demographic characteristics of the participants are presented in Table 1.

Table 1. Socio-Demographic Characteristics of ART Patients (n=161)

Characteristic		**Frequency (n)**	**Percentage (%)**
Gender	Female	98	60.9
	Male	63	39.1
Age Group (years)	18-20	67	41.6
	21-24	94	58.4
Region	Hhohho	35	21.7
	Manzini	42	26.1
	Lubombo	40	24.8
	Shiselweni	44	27.3
Education Level	Primary	23	14.3
	Secondary	112	69.6
	Tertiary	26	16.1
Employment Status	Employed	48	29.8
	Unemployed	113	70.2
Living Arrangement	With parents	89	55.3
	With partner	35	21.7
	Alone	25	15.5
	Other	12	7.5

The mean age of participants was 21.3 years (±1.9 SD). The majority of participants were female (60.9%), had secondary education (69.6%), and were unemployed (70.2%). More than half (55.3%) lived with their parents. The distribution across the four regions of Eswatini was relatively even, with slightly higher representation from Shiselweni (27.3%) and Manzini (26.1%).

ART Adherence and Clinical Outcomes

The quantitative findings on ART adherence and clinical outcomes are presented in Table 2.

Table 2. Clinical and ART Adherence Outcomes (n=161)

Variable		Frequency (n)	Percentage (%)	Mean (SD)
ART Adherence Level	Good Adherence (≥95%)	125	77.6	96.3% (±6.1)
	Poor Adherence (<95%)	36	22.4	
Viral Load Status	Undetectable (<50 copies/mL)	138	85.7	
	Detectable (≥50 copies/mL)	23	14.3	
Retention in Care	Retained	133	82.6	
	Not Retained	28	17.4	
Self-Reported Missed Doses	Never missed	75	46.6	
	Rarely missed	55	34.2	
	Occasionally missed	21	13	
	Frequently missed	10	6.2	
Missed Clinic Visits (past 6 months)	No missed visits	118	73.3	
	At least one missed visit	43	26.7	

The study revealed a mean ART adherence of 96.3% (±6.1 SD), with 77.6% of participants demonstrating 95-100% adherence based on clinical records. The cohort achieved an undetectable viral load (<50 copies/mL) of 85.7%. Retention in care was at 82.6%, which is lower than the desired 95% target. While self-reported missed doses were low, with 46.6% reporting never missing a dose, a significant proportion admitted to rare (34.2%) or occasional (13.0%) lapses. Clinic attendance was 77.0%, though 26.7% reported at least one missed visit in the past six months.

Factors Influencing Adherence and Retention

The qualitative arm of the study identified key motivators, challenges, and benefits of ART adherence and retention as reported by participants. Verbatim responses reflected the lived realities of young adults:

Motivators included: “My family supports me to take my treatment,” “I want to live long and be healthy,” and “The nurse always encourages me not to miss my doses.”

Challenges included: “Sometimes I feel tired of taking pills every day,” “I don’t tell others because they may laugh at me,” and “I don’t have money for transport to come to the clinic.” Benefits mentioned were: “I don’t get sick often now,” “I feel strong to do my work,” and “I know I won’t pass HIV to my baby.”

These narratives illustrate the multi-level influences on adherence and retention, confirming the statistical findings and deepening understanding of participant experiences.

The qualitative arm of the study identified key motivators, challenges, and benefits of ART adherence and retention.

The Factors Influencing Adherence and Retention are presented in Table 3.

Table 3. Factors Influencing Adherence and Retention

Category	Factors	Frequency (n)	Percentage (%)
Motivators	Social support (family, peers)	142	88.2
	Personal desire for health	138	85.7
	Need to prevent HIV transmission	125	77.6
	Supportive healthcare workers	119	73.9
Challenges	Treatment fatigue	98	60.9
	Side effects	87	54
	Stigma and non-disclosure	113	70.2
	Financial constraints	105	65.2
	Suboptimal healthcare worker attitudes	76	47.2
Benefits	Enhanced immunity	151	93.8
	Prolonged life	147	91.3
	Viral suppression	139	86.3
	Improved quality of life	132	82

Motivators for ART adherence and retention included social support from family and peer groups, a personal desire for health, the need to prevent HIV transmission, and supportive healthcare worker practices. Challenges included treatment fatigue, burdensome side effects, and fear of stigma leading to non-disclosure, financial constraints, and suboptimal healthcare worker attitudes. The benefits of consistent adherence were enhanced immunity, prolonged life, viral suppression, and an improved quality of life.

Association between Variables

The Bivariate analysis between Selected Variables and ART Adherence are presented in Table 4.

Table 4. Association between Selected Variables and ART Adherence

Variable		Good Adherence N (%)	Poor Adherence N (%)	χ^2/t-value	p-value
Gender	Female	79 (63.2)	19 (52.8)	1.58	0.21
	Male	46 (36.8)	17 (47.2)		
Age Group	18-20 years	48 (38.4)	19 (52.8)	2.74	0.1
	21-24 years	77 (61.6)	17 (47.2)		
Employment Status	Employed	42 (33.6)	6 (16.7)	4.21	0.04
	Unemployed	83 (66.4)	30 (83.3)		
Living Arrangement	With parents	75 (60.0)	14 (38.9)	5.31	0.02
	Other	50 (40.0)	22 (61.1)		
Duration on ART	1-2 years	32 (25.6)	15 (41.7)	3.87	0.05
	>2 years	93 (74.4)	21 (58.3)		

Employment status was significantly associated with ART adherence ($\chi^2 = 4.21$, $p = 0.04$), with employed participants more likely to have good adherence. Living arrangement also showed a significant association ($\chi^2 = 5.31$, $p = 0.02$), with those living with parents more likely to have good adherence. Duration on ART was marginally significant ($\chi^2 = 3.87$, $p = 0.05$), with those on ART for more than two years more likely to have good adherence.

The Socio-Ecological Model illustrating multi-level factors influencing ART adherence and retention among young adults in Eswatini is shown in Figure 1

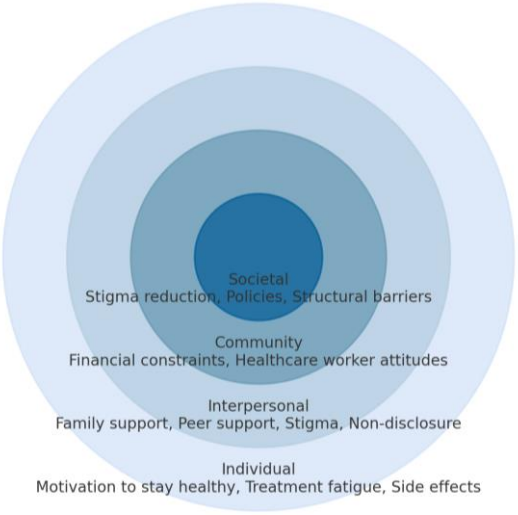

Figure 1. Socio-Ecological Model illustrating multi-level factors influencing ART adherence and retention among young adults in Eswatini.

Discussion

This study provides a comprehensive understanding of ART adherence and retention in care among HIV-positive young adults aged 18-24 years in Eswatini. The mixed-methods approach allowed for the triangulation of quantitative data on adherence levels and clinical outcomes with qualitative insights into the factors influencing these outcomes.

Adherence Levels and Clinical Outcomes

The quantitative findings revealed a mean ART adherence of 96.3% (±6.1 SD), with 77.6% of participants demonstrating 95-100% adherence based on clinical records. This is higher than adherence rates reported in some previous studies among adolescents and young adults in sub-Saharan Africa, which have ranged from 60% to 85%. The higher adherence rate in our study may be attributed to Eswatini's robust national ART program and the implementation of differentiated service delivery models, including multi-month dispensing.

The viral suppression rate of 85.7% in our study is consistent with Eswatini's overall progress towards the UNAIDS 95-95-95 targets. However, it is lower than the national average of 96.2% for adults, highlighting the "young adult gap" in HIV outcomes. This disparity underscores the need for targeted interventions for this age group.

Retention in care was at 82.6%, which is lower than the desired 95% target but higher than rates reported in some other studies among young adults in sub-Saharan Africa. This suggests that while Eswatini's healthcare system has made progress in retaining young adults in care, there is still room for improvement.

Factors Influencing Adherence and Retention

The qualitative findings identified multiple factors influencing ART adherence and retention, which can be understood through the lens of the Socio-Ecological Model. At the individual level, personal motivation and the desire for health were key motivators, while treatment fatigue and side effects were significant challenges. These findings are consistent with previous research on ART adherence among young adults.

At the interpersonal level, social support from family and peers emerged as a critical motivator, while stigma and non-disclosure were major barriers. This aligns with studies highlighting the importance of social support for ART adherence and the detrimental impact of stigma. The fear of disclosure leading to non-adherence is particularly concerning given the high levels of stigma in Eswatini [19].

At the community and organizational levels, financial constraints and suboptimal healthcare worker attitudes were significant challenges. These findings echo previous research highlighting the impact of economic barriers and healthcare provider attitudes on ART adherence.

Our findings resonate with the findings that highlighted that barriers to ART adherence emerge early in the treatment continuum and often persist without intervention [21]. Both studies demonstrate that stigma, limited disclosure, and unfavorable healthcare interactions remain dominant deterrents, while supportive family dynamics and personal motivation significantly enhance adherence.

Moreover, [21] reported that perceived discrimination and fear of social rejection particularly affected adherence intentions among newly diagnosed individuals. This insight reinforces the importance of stigma-reduction interventions, social support networks, and trust-building with healthcare providers. Addressing these behavioral and emotional barriers early can help sustain long-term adherence and retention among Eswatini's youth population.

Implications for Practice and Policy

The findings from this study have several implications for practice and policy. First, there is a need for comprehensive, tailored interventions that address the personal, sociocultural, economic, and systemic factors influencing adherence and retention. Such interventions should include:

1. Strengthening social support systems through peer support groups and family engagement programs.
2. Addressing stigma through community education and anti-discrimination campaigns.
3. Providing economic support to mitigate financial barriers to adherence.
4. Training healthcare workers on youth-friendly service provision and positive attitudes.
5. Expanding differentiated service delivery models to better meet the needs of young adults.

Secondly, there is a need for policy reforms to address the structural barriers identified in this study. These may include:

1. Integrating mental health and sexual and reproductive health services within HIV care.
2. Extending clinic hours and improving accessibility of healthcare facilities.
3. Increasing funding for transport and other support services for young adults living with HIV.
4. Developing policies to protect the rights of young adults living with HIV and reduce stigma.

Limitations

Several limitations were encountered during the execution of this study. A primary constraint was the reliance on routinely collected medical data, which often suffered from incomplete recording by health providers

and inherent inaccuracies in the records. This could affect the precision of quantitative measures and the comprehensive understanding of patient histories.

Furthermore, a methodological challenge arose in reaching certain segments of the study population. Specifically, it proved exceptionally difficult to engage patients who were habitual defaulters on ART treatment, as these individuals were actively avoiding contact with health workers. This means that the qualitative data gathered may not fully capture the most severe and entrenched barriers faced by those who are chronically lost to follow-up.

An additional practical limitation was the inability to meet the calculated sample size target. Despite a mathematical formula indicating a need for approximately 288 participants, only 161 participants were enrolled. This shortfall was directly attributable to the success of the multi-month dispensing program, which significantly reduced patients' frequency of hospital visits. This reduction in the achieved sample size implies a potential reduction in the statistical power of quantitative analyses.

Finally, the data collection period was extended from the initially planned 3 months to 6 months in an effort to mitigate the recruitment challenges, though the target sample size was ultimately not met.

Conclusion

This study provides valuable insights into ART adherence and retention in care among HIV-positive young adults aged 18-24 years in Eswatini. The findings reveal both successes and challenges in HIV care for this population. While adherence rates and viral suppression are approaching target levels, retention in care remains below the desired 95%. The study identifies multiple factors influencing adherence and retention at individual, interpersonal, community, and societal levels.

The integrated findings from both quantitative and qualitative data underscore the necessity of comprehensive, tailored interventions that address the personal, sociocultural, economic, and systemic factors influencing adherence and retention. Such interventions are critical for enhancing the well-being and health outcomes for young adults living with HIV in Eswatini and for achieving the UNAIDS 95-95-95 targets.

Addressing ART adherence among young adults requires both structural and psychosocial interventions. Understanding adherence beliefs early before behavioral patterns are entrenched may enhance long-term retention and viral suppression outcomes in Eswatini [21].

Future research should focus on developing and evaluating targeted interventions for this age group, with particular attention to addressing stigma, strengthening social support, and mitigating economic barriers. Additionally, longitudinal studies are needed to better understand the transition from adolescent to adult care and its impact on long-term health outcomes.

Data Availability

The datasets generated and analyzed during the current study are not publicly available due to the need to protect the confidentiality and privacy of the study participants, particularly given the sensitive nature of HIV status and the small population size of Eswatini. The original data, including clinical records and structured questionnaire responses, contain identifiable or potentially re-identifiable information which could compromise participant anonymity. However, anonymized and de-identified data may be made available from the corresponding author upon reasonable request and with permission from the Eswatini Health and Human Research Review Board (EHHRRB) and the Eswatini Ministry of Health, provided that data sharing is in accordance with the ethical approval granted for the study.

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Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

Ethical approval was obtained from the Texila American University Ethics Review Board and the Eswatini Health and Human Research Review Board.

Author Contributions

Author 1: Conceptualization, Methodology, Writing – Original Draft Preparation, Supervision.

Author 2: Data Curation, Formal Analysis, Visualization, Writing – Original Draft Preparation.

Author 3: Validation, Investigation, Writing – Review & Editing.

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References

[1]. Zurbachew, H. S., Woreta, A. W., Alem, S. M., Wondie, T., & Walle, B. H., 2023, Adolescent's and youth's adherence to antiretroviral therapy for better treatment outcome and its determinants: multi-center study in public health facilities. AIDS Research and Therapy. https://aidsrestherapy.biomedcentral.com/articles/10.1186/s12981-023-00632-4

[2]. UNAIDS, 2022, In Danger: UNAIDS Global AIDS Update 2022, https://www.unaids.org/en/resources/documents/2022/in-danger-global-aids-update

[3]. Govender, K., Masebo, W., Nyamaruze, P., Cowden, R. G., Schunter, B. T., & Bains, A., 2018, HIV prevention in adolescents and young people in the Eastern and Southern African region: A review of key challenges impeding actions for an effective response. *The Open AIDS Journal*. https://openaidsjournal.com/VOLUME/12/PAGE/53/ABSTRACT/

[4]. Dzinamarira, T., & Moyo, T., 2024, Adolescents and young people in sub-Saharan Africa: overcoming challenges and seizing opportunities to achieve HIV epidemic control. *Frontiers in Public Health*. https://www.frontiersin.org/articles/10.3389/fpubh.2024.1321068/full

[5]. Ministry of Health, 2022, Integrated HIV Management Guidelines, 2nd Edition. *Eswatini Ministry of Health*. https://www.who.int/publications/m/item/eswatini-integrated-hiv-management-guidelines-2022

[6]. Ashaba, S., Baguma, C., Tushemereirwe, P., Nansera, D., Maling, S., Zanon, B. C., & Tsai, A. C., 2024, Correction: Correlates of HIV treatment adherence self-efficacy among adolescents and young adults living with HIV in southwestern Uganda. *PLOS Global Public Health*, 4(10):e0003874. Doi: 10.1371/journal.pgph.0003874. https://pubmed.ncbi.nlm.nih.gov/39405301/

[7]. Creswell, J. W., & Plano Clark, V. L., 2018, Designing and Conducting Mixed Methods Research, 3rd ed., *Sage Publications*, Thousand Oaks, CA. https://us.sagepub.com/en-us/nam/designing-and-conducting-mixed-methods-research/book247952

[8]. Chouraya, C., Ashburn, K., Khumalo, P., Mpango, L., Mthethwa, N., Machekano, R., Guay, L., & Mofenson, L., 2019, Association of antiretroviral drug regimen with viral suppression in HIV-positive children on antiretroviral therapy in Eswatini. *The Pediatric Infectious Disease Journal*. http://dx.doi.org/10.1097/INF.0000000000002347

[9]. UNAIDS, 2023, The path that ends AIDS: UNAIDS Global AIDS Update 2023. https://www.unaids.org/en/resources/documents/2023/global-aids-update-2023-path-that-ends-aids

[10]. ICAP at Columbia University, n.d., Eswatini HIV Incidence Measurement Survey (SHIMS3) 2021: Fact Sheet. ICAP at Columbia University. Retrieved September 16, 2025, from https://phia.icap.columbia.edu/eswatini-summary-sheet/

[11]. Wilkinson, L. S., Skordis-Worrall, J., Ajose, O., & Ford, N., 2015, Self-transfer and mortality amongst adults lost to follow-up in ART programmes in low- and middle-income countries: systematic review and meta-analysis. *Tropical Medicine & International Health*, 20(3):365–379. Doi: 10.1111/tmi.12434. https://pubmed.ncbi.nlm.nih.gov/25418366/

[12]. Vreeman, R. C., McCoy, B. M., & Lee, S., 2017, Mental health challenges among adolescents living with HIV. *Journal of the International AIDS Society*, 20(S3):21497.

[13]. Villiera, J. B., et al., 2022, Factors associated with antiretroviral therapy adherence among adolescents living with HIV in the era of isoniazid preventive therapy as part of HIV care. *PLOS Global Public Health*, 2(6).

[14]. Ferrand, R. A., Briggs, D., & Penazzato, M., 2016, Viral suppression in adolescents on antiretroviral treatment: review of the literature and critical appraisal of methodological challenges. *Tropical Medicine & International Health*, 21(3):325–333.

[15]. Ritchwood, T. D., Malo, V., & Jones, C., 2020, Healthcare retention and clinical outcomes among adolescents living with HIV after transition from pediatric to adult care: a systematic review. *BMC Public Health*, 20(1):1195.

[16]. UNAIDS, 2024, Fact sheet – Latest global and regional statistics on the status of the AIDS epidemic.

[17]. UNAIDS, 2023, Global AIDS Strategy 2021–2026: End Inequalities. End AIDS. https://www.unaids.org/sites/default/files/media_asset/unaids-strategy-2021-2026_en.pdf.

[18]. Mphande, S., Namwera, R., Shambira, K., & Mutale, S., 2025, Barriers to ART adherence in sub-Saharan Africa: a scoping review toward achieving UNAIDS 95-95-95 targets. *Frontiers in Public Health*, 13. https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1609743/full

[19]. Motsa, T., Sibanda, N., Gwebu, P. M., & Nxumalo, R., 2023, Views of adolescents living with perinatally acquired HIV on HIV status disclosure in Eswatini. *AIDS Care*, 35(12):1787–1793. https://www.tandfonline.com/doi/full/10.1080/09540121.2023.2299334

[20]. Madiba, S., & Josiah, S., 2019, The impact of a family-centered model of care for HIV-positive children on viral suppression and retention in care: a randomized controlled trial in Eswatini. *PLOS ONE*, 16(8):e0256256. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256256

[21]. Mango, T., Kasese-Hara, M., & Mulaudzi, M., 2024, Beliefs affecting ART adherence in newly diagnosed HIV-positive participants in Manzini, Eswatini. *South African Journal of HIV Medicine*, 25(1):1601. https://doi.org/10.4102/sajhivmed.v25i1.1601

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The Increasing Trend of Lassa Fever and the Hopelessness of Quick Intervention: Nigeria at Focus

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Abstract

This study investigated the increasing threat of Lassa Fever in Nigeria and highlighted the urgent need for global attention due to the rising number of deaths and confirmed cases. The main purpose of the study was to call for the intervention of the international Bodies to stall the rising trend of Lassa Fever in Nigeria. Contextually, though, the study sought to ascertain whether the Lassa Fever in Nigeria is on the increase; ascertain whether efforts had been made to arrest the situation of Lassa Fever in Nigeria and to determine whether the attention of the World Health Organization is needed in Nigeria to eradicate Lassa Fever. The study adopted a qualitative Meta-Analysis approach. It was found in the study that Lassa Fever in Nigeria is on the increase, from the viewpoint of scientific observation, where, from 1981 – 1988 there was no trace of LF on the average, efforts were made by the ministry of health in conjunction with other world bodies to arrest the situation of Lassa Fever in Nigeria and the attention of the World Health Organization is needed in Nigeria to eradicate Lassa Fever.

Keywords: *Confirmed Disease, Deaths, Fatality Rate, Globalization, Health Issues, Spread.*

Introduction

Nigeria, with an estimated population of 213.4 million people – Worldometer [1], located in West Africa is being threatened with an increasingly increasing rate of Lassa Fever, calling for urgent global attention. As of January 2023, the Nigeria Centre for Disease Control and Prevention (NCDC) saw the urgent need to activate the National Multisectoral Emergency Operations Centre for Lassa Fever OCHA [2]. The number of deaths recorded as of January 2023 were 37 with 244 confirmed cases. The fatality rate stood at 15.1% from 16 states out of the 36 states, and Abuja, the Federal Capital. NCDC, the relevant Ministries, Departments, and Agencies (MDAs), stakeholders and major partners in Nigeria termed the situation as 'very high risk of increased Lassa Fever transmission'. The sole aim of this program was to stall its spread and successfully treat the infected persons. This was not achieved. Things went south as the number of deaths increased to 188 and confirmed cases of 1,095. As of December 2023, the confirmed cases have been pushed up to 1,623. Correspondingly, the case-fatality ratio of the outbreak has moved up to 17.2% - Lara [3] in 113 Local Government Areas in 28 states.

This article aims to emphasize the deplorable and the increasing trend of Lassa Fever in Nigeria, as highlighted on the theme of this article. The situation calls for urgent global attention as the number of deaths and confirmed cases continue to rise. The author emphasizes the need for quick intervention to prevent further spread of the disease, especially with the dry season and other contributing factors such as poverty, bushfires, poor medical facilities, defective emergency response plans, and weak budgets for the health sector. It is important for the relevant authorities to take necessary measures to address this malaise and prevent

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more deaths.

This article touched substantially on the anatomy, etiology, pathogenic, communicability, geographical scope, vector, symptomatology, cytomegalovirus, therapy, and the morbidity of Lassa Fever.

The Purpose and Objectives of the Study

The primary and overall purpose of this study is to attract the attention of the World Health Organization for a quick intervention into the quagmire of Lassa Fever in Nigeria. The sub-objectives in carrying out this study is tied to the real health situation in Nigeria as it relates to Lassa Fever. Contextually, therefore, in a smaller and more explicitly, this study tries to:

1. Ascertain whether the Lassa Fever in Nigeria is on the increase.
2. Ascertain whether efforts had been made to arrest the situation of Lassa Fever in Nigeria.
3. Whether the attention of the World Health Organization is needed in Nigeria to eradicate Lassa Fever.

What is Lassa Fever? The Virology

The nomenclature Lassa Fever is defined differently by different authorities, but on the principle of agreement reality, sound contextually the same. According to the World Health Organization (WHO) [4], Lassa Fever is an 'acute viral hemorrhagic illness caused by Lassa virus.' W.H.O went on to explain that Lassa virus is a member of the arenavirus family of viruses. Humans ultimately fall victims through the infection of Lassa virus when exposed to food or household items contaminated with urine or feces of infected Mastomys rats. On their part, the CDC [5] defined Lassa Fever as an acute viral illness spread by the common African rat. According to Cleveland Clinic [6], Lassa Fever is a type of viral hemorrhagic illness one gets from humans or rats infected with Lassa virus. They added that it is a type of Viral Hemorrhagic Fever (VHF), a group of viruses that can cause uncontrolled bleeding. In a different form, MSD MANUAL Professional Version [7] define Lassa Fever as a disease from Lassa virus, which is a single stranded RNA virus in the Arenaviridae family.

Evan [8] stipulated a simple definition of Lassa Fever as a viral disease that is spread by rats. On their part, Richmond & Deborah [9] defined Lassa Fever as a viral hemorrhagic fever transmitted by rats. According to Jill [10], Lassa Fever is an acute viral disease carried by a type of rat that is common in West Africa. Adding the voices of six authorities in one sweep - Idris, Abubakar, Peter, Nkechi, Dele & Matthew [11] in the implied definition of Lassa Fever, they said in one voice that Lassa Fever is a viral hemorrhagic fever disease caused by Lassa mammarenavirus (LASV). These definitions point to a single agreement reality that Lassa Fever is a disease of bleeding in humans, caused by the urine and feces of rats.

The Pictorial Structure of Lassamammarena Virus (LASV) – The Anatomy

The author includes two figures to enhance the reader's understanding of Lassa Fever and its causative virus. The first figure provides a visual representation of the Lassa mammarenavirus (LASV), offering insight into its appearance. The second figure, titled *Lassa_mammarenavirus#Pathogenesis*, illustrates the pathogenesis of the virus, highlighting the processes involved in its progression.

Lassamammarena Virus (LASV)

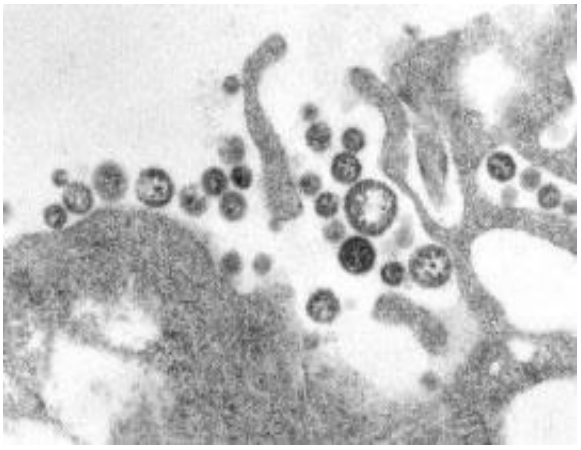

Figure 1. The Structure of Lassamammarena Virus (LASV)

(adapted from CDC, 2025)

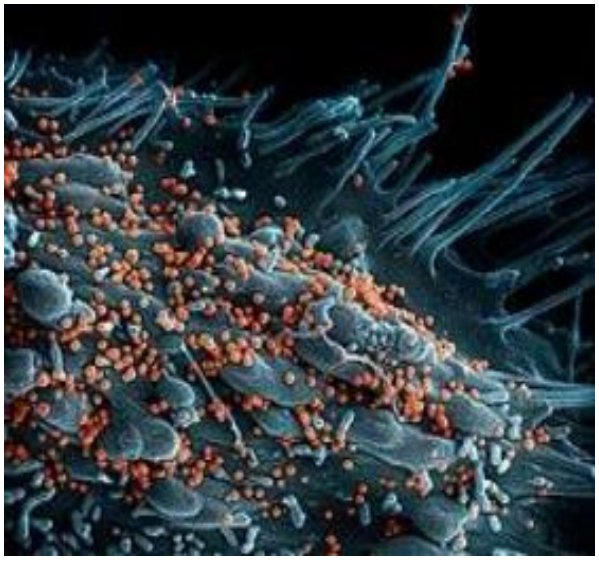

Figure 2. An adapted Image of the Pathogenesis

(adapted from Wikiwand (n.d.))

Where did Lassa Fever Start? The Etiology

Lassa Fever is named after the small town of Lassa, located in present-day Southern Borno State, Nigeria. According to Ibrahim [12], a native of Lassa, the origins of the disease trace back to 1969. Mrs. Laura Wine, a missionary with the Church of the Brethren in the USA, was assigned to the Lassa Mission Hospital, where she served as the head of obstetrics after retiring from her nursing career in Chicago.

Ibrahim [12] recounts that upon returning from a leave in the USA, Mrs. Wine developed a persistent and severe fever after resuming her duties. Her illness was initially managed by Hamidu Gadzama, a nurse at the hospital and Ibrahim's father's cousin, who suspected malaria and treated her with conventional fever remedies. However, when her condition did not improve, Gadzama contacted the missionary headquarters in Jos for assistance. They arranged for her transport, sending an airplane to Mubi airstrip to take her to Jos. From there, she was transferred to SIM/ECWA Evangelist Hospital, Jan Kwano (now Bingham University Teaching Hospital), a better-equipped medical facility.

Mrs. Wine's condition deteriorated further at Jan Kwano. Medical samples were sent to the United States for testing, and her travel history was reviewed. It was revealed that she had traveled through another West African country, likely Sierra Leone, entered Nigeria via Lagos, and stopped in Jos before reaching Borno State. Tragically, Mrs. Wine succumbed to the illness. Shortly after her death, the doctor and nurse who treated her in Jos also fell ill and died. It became evident that they were dealing with a previously unknown and highly contagious illness. Further investigations revealed that the cause of death was a novel arenavirus. The U.S. Centers for Disease Control (CDC) identified and confirmed this discovery. The new virus was subsequently named "Lassa Fever" in honor of Lassa town, where the outbreak began.

How Fast Does Lassa Fever Spread? – The Pathogenesis

Records show that about 300,000 people get Lassa fever, and over 7,000 deaths in countries of West Africa every year. The spread of the infection occurs primarily through direct contact with the urine, feces, saliva, or blood of infected rats. Additionally, it can spread through contact with objects, household items, and surfaces that have been contaminated with these bodily fluids from infected rats. Consumable food or water can also become contaminated in this manner. Person to-person transmission is possible through contact with the blood, urine, feces, vomit, and other bodily fluids of an infected individual. At the incipient stage, Lassa fever presents, like many common illnesses that involve a fever, such as malaria. Other symptoms may include headache, overall body weakness, cough, nausea, vomiting, diarrhea, muscle aches, chest pain, sore throat, and in severe cases, bleeding from the ears, eyes, nose, mouth, and other bodily openings. The incubation period for the disease ranges from 3 to 21 days before symptoms manifest.

The Spread of Lassa Fever in Nigeria

From the onset of Lassa Fever in 1969 until 2020 in Nigeria, all four-year periods showed an increase in the number of deaths, except for the periods 1973–1976, 1977–1980, and 1993–1996, as reported by Dennis, George, Christian, & Oyewale [13] (see Table 2). A time series analysis, using the same secondary data from Table 1, projected that the total number of deaths for the 2021–2024 period would reach 478, as calculated in the equation below. This downward trend could be as a result of underreporting, especially in northern Nigeria - David, Rory Gibb, Chioma, Elsie, Rimamdeyati, Saliu, Michael, Akanimo, Lauren, Christl, Ibrahim, Kate & Chikwe [14]. Even as this figure is 349 deaths less than the penultimate figure, it is still premature to conclude that the death rate has started declining. This is so because from 1985 – 1988, no record of any case of Lassa Fever. This is the researcher's benchmark. According to Dennis, George, Christian, & Oyewale [13], in the late fourth decade, spanning from the 10th 4- year period (2005–2008) to 2020, there was a notable increase in the number of affected states and geopolitical zones. Specifically, in 2016—prior to the subsequent surge in 2020—28 states, constituting 78% of the total 36 states in the country, experienced widespread outbreaks. Dennis, George, Christian, & Oyewale [13] added that the spikes in caseload relating to Lassa Fever, emphasize the urgent and necessity to source and implement more effective countermeasures.

Table 1. Data Summary

Group of 4 Years (x)	Number of Deaths (y)	xy	x^2
-6	25	-150	36
-5	2	-10	25
-4	1	-4	16

-3	0	0	9
-2	0	0	4
-1	27	-27	1
0	21	0	0
1	26	26	1
2	86	172	4
3	213	639	9
4	307	1,228	16
5	309	1,545	25
6	827	4,962	36
Total	**1,844**	**8,381**	**178**

adapted from Dennis, George, Christian, & Oyewale [13]

Equation 1: Time Series Projection of Deaths (2021-2024) based on Data summary in Table 1 above.

Forecast of Deaths Between 2021-2024, Using Time Series Analysis Formula in Projection of the Number of Deaths and Estimated Years

Formula used for the Time Series Analysis:

Expected Number of Deaths

$$D = a + b(t)$$

Where:

$$a = \frac{\Sigma xy}{n}$$

$$b = \frac{\Sigma xy}{\Sigma x^2}$$

$t = Expected\ Years\ Under\ Review$

$n = the\ number\ of\ items$

Calculation of Constants:

a: $a = \frac{\Sigma xy}{n} = \frac{1844}{13} = 141.846 \simeq 142$

b: $b = \frac{\Sigma xy}{\Sigma x^2} = \frac{8381}{178} = 47.08 \simeq 47$

Forecast for 2021–2024:

The projected group of years t =7 (as the midpoint of 2021–2024 corresponds to t=7)

$$\boldsymbol{D = a + b(t)}$$

Substituting the values:

$$D = 141.846 + (47.08 \times 7)$$

Simplify:

$$D = 141.846 + 329.56 = 478$$

Final Forecast:

$The\ expected\ number\ of\ deaths\ between\ 2021 - 2024\ is\ approximately\ 478$

Table 2. Caseload and Case Fatality of Lassa Fever Outbreaks in Nigeria, 1969–2020

Study Period	**Average Population**	**Suspected Cases (No. per 1M)**	**Confirmed Cases (No. per 1M)**	**Deaths Among Suspected Cases (%)**
1969–1972	56,665,493.50	54 (0.953)	23 (0.406)	25 (46.3)
1973–1976	62,596,869.50	7 (0.112)	7 (0.112)	2 (28.6)
1977–1980	70,314,952.25	1 (0.014)	1 (0.014)	1 (100.0)
1981–1984	78,432,910.75	0	0	0
1985–1988	86,943,121.75	0	0	0
1989–1992	96,457,454.75	38 (0.394)	23 (0.239)	27 (71.1)
1993–1996	106,652,895.50	159 (1.491)	2 (0.019)	21 (13.2)
1997–2000	117,830,333.80	135 (1.146)	26 (0.221)	26 (19.3)
2001–2004	130,302,793.80	175 (1.343)	73 (0.560)	86 (49.1)

2005–2008	144,503,231.00	534 (3.695)	202 (1.398)	213 (40.0)
2009–2012	160,715,500.30	4,925 (30.644)	467 (2.906)	307 (6.2)
2013–2016	178,817,109.80	4,721 (26.401)	437 (2.444)	309 (6.6)
2017–2020	198,462,788.80	17,262 (86.979)	2,893 (14.577)	827 (4.8)
Total (1969–2020)	114,515,035.40	28,011 (244.605)	4,154 (36.275)	1,844 (6.6)

(adapted from Agbonlahor et al., 2021)

The Transportation of Lassa Fever (Communicability)

Figure 3 below illustrates the transportation and communicability of Lassa Fever, showing how the virus spreads from one individual to another.

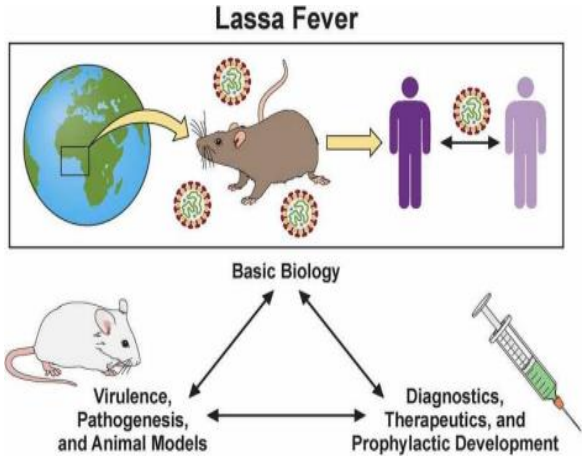

Figure 3. The Communicability of Lassa Fever

Adapted from Murphy, H. L., & Ly, H. (2021).

Geographical Scope of Lassa Fever

Lassa Fever is currently confined to the West African region, affecting eight countries: Benin, Ghana, Guinea, Burkina Faso, Liberia, Mali, Sierra Leone, Côte d'Ivoire, Togo, and Nigeria. Recently, it has also been reported in the Central African Republic, Guinea, and the Democratic Republic of the Congo. This is further illustrated in Figures 4 and 5, which show maps depicting the countries where Lassa Fever is present.

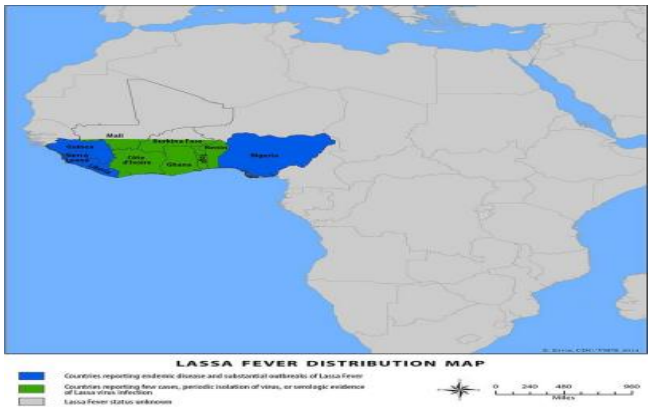

Figure 4. Maps depicting the countries where Lassa Fever is present

Source: adapted from CDC, 2025



Figure 5. Maps depicting the countries where Lassa Fever is present

Source: adapted from CDC, 2025

The Lassa Fever Reservoir (Vector)

This section addresses how the infectious agent lives and multiplies. According to OCHA [2] The virus's natural reservoir is the Mastomys natalensis rodent, commonly known as the multimammate rat or African rat. OCHA noted that other rodents can also carry the virus. Added to OCHA's view on reservoir of Lassa Fever agent, on their part, MSD MANUAL Professional Version [7] put it that the reservoir is the rats mastomys natalensis, M. erythroleucus, and Hylomyscus pamfi. They added that pygmy mouse, mus baoulei has recently been implicated as a reservoir species in Lassa Fever infested areas. In most cases, Lassa Fever results from contamination of food with rodent urine, saliva, or feces, but human-to-human transmission can also occur through exposure to the urine, feces, saliva, vomitus, or blood of infected people. Nosocomial, which is transmission from human-to-human in the hospital, is also common when either the nurses or other persons or doctors are not protected. From serological information, people living around places of high population density are prone to a very high rate of infection, much higher than their rate of hospitalization for Lassa Fever. According to CDC [5], an estimated 80% of infected people have mild disease and about 20% have severe, multisystem disease. According to WHO [4], the multimammate rat, the main reservoir of the Lassa virus, is common.

Methodology

The researcher adopted a qualitative desk Meta-Analysis design, in which, various medical reports from WHO, government ministries of health, and individual medical researchers were rigorously examined. The findings and conclusion were drawn from the reports and materials. However, a Time Series Analysis was carried out on the secondary data.

Dennis, George, Christian, & Oyewale [13], and applied the computation of the expected number of deaths from 2021 – 2014, which was not captured in the analysis given as shown in table 2 above.

Symptoms of Lassa Fever (Symptomatology)

Table 3. Serological Data of Lassa Fever

Category	Guinea	Nigeria	Sierra Leone	Overall
Estimated rural population	5,544,720	64,787,478	2,823,605	73,155,803
Seronegative in general population (%)				
- Lowest	45.0	NA	48.0	
- Highest	96.0	78.7	92.0	

Population “at risk” (seronegative)				
- Lowest	2,495,124	NA	1,355,330	
- Highest	5,322,931	50,987,745	2,597,717	58,908,393
Seroconversions per year				
- Lowest (5%)	124,756	NA	67,767	
- Highest (22%)	1,171,045	11,217,304	571,498	12,959,847
Seroconversion plus illness per year				
- Lowest (9%)	11,228	NA	6,099	
- Highest (26%)	304,472	2,916,499	148,589	3,369,560
Ratio of fatality to infection per year				
- Lowest (1%)	112	NA	61	
- Highest (2%)	6,089	58,330	2,972	67,391
Estimated seropositivity (%)				
- Lowest	4%	NA	8%	
- Highest	55%	21.3%	52%	
Estimated numbers seropositive				
- Lowest	221,789	NA	225,888	
- Highest	3,049,596	13,799,733	1,468,275	18,317,604
Estimates of annual reinfection				
- Lowest (1%)	2,218	NA	2,259	
- Highest (18%)	548,927	2,483,952	264,289	3,297,168

Source: adapted from Richmond, J. K., & Baglole, D. J. (2003).

The signs of Lassa fever begin with mild fever that gradually progresses into a more tense fever. Weakness of the body, a general feeling of discomfort, and gastrointestinal issues like nausea, vomiting, diarrhea, dysphagia, stomach ache, etc., signs of hepatitis may also occur. Richmond & Deborah [9] stipulated that it has an incubation period of 5 to 16 days, after which symptoms may progress to health prostration with sore throat, cough, chest pain, and vomiting. The sore throat becomes more severe within the first week. Patches of white or yellow tissues may appear alongside the exudate from the tonsils, often creates coalesce, which transmutes into a pseudomembrane in the conjunctiva. According to WHO [4], in advanced situations, facial swelling, fluid in the lung cavity, bleeding from the mouth, nose, vagina or gastrointestinal tract, and low blood pressure may develop. Occasionally, however, patients have tinnitus, epistaxis, maculopapular rash, cough, and dizziness. Often, pericarditis occurs in patients. Sensorineural Hearing Loss (SNHL) comes up to 20 to 30% becomes permanent. The level of fever and the degree of aminotransferases in an infected person is a function of the severity of the disease in the patient. Note also that progression to severe illness results in shock, delirium, rales, pleural effusion, and, occasionally, generalized seizures. Defervescence may take place within 4 to 7 days in patients who receive early treatment.

Lassa Fever is not without sequelae consequences, which include alopecia, iridocyclitis, and transient blindness. The possibility of its transmission through is

uncertain yet. Conventionally, distinguishing Lassa Fever disease from other viral hemorrhagic fever and from febrile illness such as malaria, typhoid fever, shigellosis, leptospirosis, rickettsial disease, and relapsing fever are difficult. An estimate of 80% of people with Lassa fever manifest mild symptoms like Fever, Tiredness, Cough, Sore throat, Headache. In extreme cases, about 20% have severe symptoms like chest pain or neck pain or stomach pain, difficulty in breathing, severe vomiting or diarrhea, bleeding from the mouth, nose, eyes or other and seizures and confusion.

Effect of Lassa Fever on Pregnancy (Cytomegalovirus)

In women, there could be pregnancy loss or miscarriage. Pregnant women need special care when infected with Lassa Fever. Most times, the fetus in the womb does not survive a Lassa Fever infection by the mother. An estimated 75% of pregnancies end up in the loss of the fetus. In ideal situations, early delivery is recommended to increase the chances of saving the mother and the child.

Other Effects of Lassa Fever on the Infected Victim (Anaphylaxis)

Victims of Lassa Fever suffer from pericarditis. That is the inflammation of the lining around your heart. They also suffer from pleural effusion. That is accumulation of fluid around the chest and the lungs due to poor pumping by the heart. Hepatitis is another health challenge suffered by the Lassa Fever infected person. This is a serious liver problem. Thrombocytopenia is another illness that is suffered by a Lassa Fever infected person. This is the health challenge of platelets deficiency in the blood. In this case, blood clotting to stop bleeding is a challenge. On the contrary, there could be severe blood clotting disorders referred to as Disseminated Intravascular Coagulation (DIC). Encephalopathy is another health challenge in the body of the Lassa Fever infected person. This is an infection that hampers the proper function of the brain. There is also this problem of insufficient blood supply that causes poor respiration. It is referred to as Acute Respiratory Distress Syndrome (ARDS). Septicemia is another health challenge that is a life-threatening complication. This is the release of chemicals in the bloodstream, resulting in inflammation in the blood. The use of Dialysis cannot be ruled out as a remedy to kidney malfunction because of the effect of Lassa Fever in an infected person.

Prevention (Prophylaxis)

Prevention, they say, is better than cure. Though the author would put forth a few means to prevent contacting Lassa Fever, it is almost impossible to prevent the presence of rats in our environment. WHO stipulated that the mastomys rat is so widespread that it cannot realistically be eradicated in the affected African Areas. The following steps, however, can be taken to prevent Lassa Fever as suggested by Evan [8]:

1. Store food in rat-proof containers.
2. Keep the place where you're staying clean, so critters are less tempted to wander in.
3. If you spot rats inside, either stay somewhere else or set up rat traps.
4. Never try to cook or eat rats.

Jill [10] also suggested that Lassa Fever can be prevented in the following ways:

1. Regular handwashing
2. Storing foods in rodent-proof containers
3. Keeping garbage away from the home
4. Keeping pet cats
5. Avoiding blood and other bodily fluids when caring for sick relatives
6. Following safe burial procedures
7. Using protective equipment in a healthcare setting, including masks and eyewear

Aside from the precautionary measures opined by Jill and Evan, global preventive measures include the use of personal preventive equipment like safety goggles, high-efficiency masks, a negative-pressure room, positive-

pressure filtered air respirators. Avoidance of physical contact with an infected person is highly recommended as a preventive measure. Avoidance of food, water, and environment contaminated by infected rodents is highly necessary. Cleaning up materials contaminated by rat excreta is very necessary. Keeping living areas clean and sanitized, with food in closed containers to discourage attracting rats are unavoidable, if Lassa Fever is to be prevented. Isolation of infected persons is also recommended. Community hygiene lifestyle approach is another means of preventing Lassa Fever.

Deforestation and bush burning should be avoided as it is a major man-made activity that has encouraged the migration of dangerous small rodents from the jungle to human settlements in villages, communities, and towns. Proper legislation and enforcement of the same should be encouraged to discourage the practices of bush burning and deforestation. Prevention of Lassa Fever is simply by keeping rats away from homes and isolation of infected persons from the rest.

Treatment (Therapy)

Treatment of Lassa Fever is usually with the Antiviral Medication Ribavirin, first pioneered in 1979 by Joe McCormick. He however proposed that early administration of Ribavirin was advised for success. Other treatments could be administered, though, depending on the condition of the patient. An initial supportive care could be administered with the intention of rehydrating the patient cum symptomatic treatment, which would improve survival of the patient. The mortality rate of the patient would be jerked up by 90% if ribavirin is administered within the first six days. It is very important to administer supportive treatment, which includes correction of fluid and electrolyte imbalance. Administering drugs to Lassa Fever patients through Intravenous (IV) is twice more result oriented than oral. Obviously, when a patient goes to the hospital in the Lassa Fever case, oxygen may be given to the patient and the blood pressure would be kept under check, and such other services.

The Quagmire in Lassa Fever (Morbidity)

The author, having epidemiologically considered the spatiotemporal of Lassa Fever, some of the quagmire observed, that would need urgent attention are as follows:

1. No vaccine for Lassa fever is available.
2. Although Anti-Lassa Fever Plasma has been tried in every Lassa Fever patient, however, nothing beneficial has been shown, and it's not currently recommended.
3. Up till now, only production of a combined, single dose vaccine against yellow fever and Lassa fever has been proposed, but not produced.
4. Although several compounds have shown in vitro efficacy, only the guanosine analogue ribavirin has practical application.
5. It is important to note that not many people are likely to go to hospital for Lassa Fever treatment, as the cost of treatment is expensive and can only be afforded by the rich.
6. The antiviral ribavirin has been used to treat Lassa Fever, but its efficacy is unproven.
7. Lassa Fever can be used as a biological weapon.
8. According to Adewuyi, Fowotade, & Adewuyi [15], failure to effectively control Lassa Fever would make the attainment of the millennium development goals of reducing maternal and infant mortality rates impossible.
9. Current overall risk at the national level is considered high.
10. According to UTMB News [16] As many as 500,000 people are infected each year in West Africa.
11. There are no vaccines currently licensed

for the prevention of Lassa Fever.

12. In the words of NLM [17], there are probably several thousand people each year.
13. W.H.O [18] asserted that humans usually become infected with Lassa virus through exposure to food or household items contaminated with urine or feces of infected Mastomys rats. They added that the disease is endemic in the rodent population in parts of West Africa.
14. According to Fabiyi [19], Lassa fever has nonspecific clinical symptoms which have been confused with yellow fever, constituting a public health disease in several countries in Africa.
15. According to Hamblion, Raftery, Wendland, Dweh, Williams, George, Soro, Katawera, Clement, Gasasira, Musa & Nagbe [20], the case fatality rate in the confirmed cases was 29%.
16. Titus [21] asserted that the high virulence and fatality rate of this disease is a major concern which is further complicated by the non-specific modes of presentation (mimicking some other fevers).
17. Reliefweb [22] was cited as saying that despite affecting up to 300,000 people a year across West Africa, and causing more than 5,000 deaths annually, Lassa fever is a poorly understood disease that is challenging to diagnose and treat.

Findings

From the qualitative Meta-Analysis in this study, the followings were found:

1. Lassa Fever in Nigeria is on the increase, from the viewpoint of scientific observation, where, from 1981 – 1988 there was no trace of LF. It started its upward trend again from 1989. The computed outcome of deaths of 478 notwithstanding.
2. Efforts were made by the ministry of health in conjunction with other world bodies to arrest the situation of Lassa Fever in Nigeria.
3. The attention of the World Health Organization is needed in Nigeria to eradicate Lassa Fever.

Discussion of Findings

On the finding number 1, according to W.H.O [23], Nigeria is currently experiencing a large outbreak of Lassa fever, with 4702 suspected cases, five probable cases, and 877 confirmed cases between epidemiological weeks 1 and 15 of 2023 (week ending 16 April). This seems to be in sympathy with the view of the author as he computed 478 deaths from 2021 - 2024, using time series analysis. If out of 877 confirmed cases, there were 478 deaths, then, the percentage of the death figure to the confirmed cases was high. According to Donatus [24], The Disease Centre said that 411 cases have been confirmed, and 72 deaths have been recorded from the outbreaks as of February 11, 2024. However, this figure by NCDC is in contrast with the author's computation. The 72 deaths are for only January and February 2024.

On finding number 2, the NCDC [25] had declared that: "The Federal Government of Nigeria, through the Federal Ministry of Health and Social Welfare and the Nigeria Centre for Disease Control and Prevention (NCDC's) National Lassa Fever Technical Working Group (TWG) leads on efforts to prevent, detect, and respond to cases of Lassa fever across the country." However, Monica & Erhabor [26] spotted some irregularities in the control of diseases and the administration of funds to stop the spread of diseases. They asserted that there was systemic fraud in the health sector. They describe Systemic fraud in the health sector as the vulnerability of the health system to fraud through intentional deception or false representation of health material facts that are committed either for personal gains or for the benefit of some others. The author believes that corruption could have been the bane in curbing the spread of Lassa

Fever in Nigeria.

On findings number 3, Ernest, Oluwasegun & Oluwasogo [27] stipulated that Lassa fever, a known endemic infectious disease of poverty, had emerged as a severe outbreak of public health threat and burden in Nigeria. A grievous situation as this requires the application of the Disaster Relief Emergency Fund, which was established in 1985 and is supported by contributions from donors, according to the US mission in Nigeria [28], the European Union and its Member States are the world's leading donors of humanitarian aid. They added that relief assistance is an expression of European solidarity with people in need all around the world. The assertion by the US in Nigeria buttresses the fact that the situation of Lassa Fever in Nigeria needs an international intervention.

Lassa Fever, an acute viral hemorrhagic disease endemic to parts of West Africa, continues to pose a serious public health threat. Efforts to combat the disease have led to significant advancements, including the development of a new vaccine by researchers at the University of Texas Medical Branch (UTMB) see figure 6 below. This vaccine has recently been approved, marking a significant milestone in the fight against Lassa Fever. This vaccine is seen as a crucial tool in preventing outbreaks and saving lives, particularly in areas with frequent Lassa Fever occurrences.



Figure 6. Image: A New Lassa Fever Vaccine from the University of Texas Medical Branch

Source: adapted from UTMB News, 2023.

Conclusion

This study had as its central purpose the need for the international health players to come to the aid of Nigeria, in relation to Lassa Fever. Lassa Fever has become a quagmire in Nigeria as there is no approved vaccine, no standardized approach to its treatment and no hope of its cure in the nearest future. Currently, there are about 2000 confirmed cases and about 200 deaths yearly in Nigeria alone. It is known as an acute viral hemorrhagic illness caused by a virus from rats in West Africa. History has it that Lassa Fever originated from a town in the southern Borno State called Lassa in 1969. From one state in Nigeria in 1969 to 16 states as of January 2023. By December 2023, the affected states had moved up to 28. Today, it has spread across the West African region to the Central African region. The spread of this disease is so fast that medical experts have termed the dreaded disease as an anti-Millennium Development Goal (MDG); saying that if it is not controlled, there would not be attainment of the MDG. The best that can be done concerning Lassa Fever is to prevent it by staying away from rats as a way of avoiding encountering the excreta and urine rats. A spatiotemporal hygienic lifestyle is the best option for now in dealing with Lassa Fever. The attention of the global health community is needed in Nigeria. It was found in the study that Lassa Fever in Nigeria is on the increase on the average, Efforts were made by the ministry of health in conjunction with other world bodies to

arrest the situation of Lassa Fever in Nigeria and the attention of the World Health Organization is needed in Nigeria to eradicate Lassa Fever.

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References

[1]. Abdullahi, I. N., Anka, A. U., Ghamba, P. E., Onukegbe, N. B., Amadu, D. O., and Salami, M. O., 2020, "Need for preventive and control measures for Lassa fever through the One Health strategic approach," *Proceedings of Singapore Healthcare*, vol. 29, no. 3, pp. 190-194. Available: https://doi.org/10.1177/2010105820932616 [Accessed: 15-Nov-2024].

[2]. Adejoro, L., 2023, "NCDC confirms 1,095 Lassa fever cases, 188 deaths," *Punch*, [Online]. Available: https://punchng.com/ncdc-confirms-1095-lassa-fever-cases-188-deaths/#:~:text=The%20Nigeria%20Centre%20for%20Disease,2023)%2C%20released%20on%20Tuesday. [Accessed: 15-Nov-2024].

[3]. Adewuyi, G. M., Fowotade, A., and Adewuyi, B. T., 2009, "Review article," *African Journal of Clinical and Experimental Microbiology*, September, [Online]. Available: file:///C:/Users/Dr.%20Abel's%20PC/Downloads/ajol-file-journals_47_articles_43407_submission_proof_43407-553-39991-1-10-20090611.pdf. [Accessed: 15-Nov-2024].

[4]. Akinyele, F., 1976, "Lassa fever (arenaviruses) as a public health problem," *PubMed*, [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/1026322/. [Accessed: 15-Nov-2024].

[5]. Agbonlahor, D. E., Akpede, G. O., Happi, C. T., and Tomori, O., 2021, "52 Years of Lassa Fever Outbreaks in Nigeria, 1969–2020: An Epidemiologic Analysis of the Temporal and Spatial Trends," *American Journal of Tropical Medicine and Hygiene*, [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8592130/. [Accessed: 15-Nov-2024].

[6]. Akokuwebe, M. E., and Idemudia, E. S., 2023, "Fraud within the Nigerian health system, a double threat for resilience of a health system and the response to the COVID-19 pandemic: a review," *The Pan African Medical Journal*, vol. 45, [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10516760/. [Accessed: 15-Nov-2024].

[7]. Anichukwueze, D., 2024, "NCDC Records 2,122 Lassa Fever Cases in 21 States," *Channelstv.com*, [Online]. Available: https://www.channelstv.com/2024/02/23/ncdc-records-2122-lassa-fever-cases-in-21-states. [Accessed: 15-Nov-2024].

[8]. Abdullahi, I. N., Anka, A. U., Ghamba, P. E., Onukegbe, N. B., Amadu, D. O., and Salami, M. O., 2020, "Need for preventive and control measures for Lassa fever through the One Health strategic approach," *SAGE Journals*, [Online]. Available: https://journals.sagepub.com/doi/pdf/10.1177/2010105820932616. [Accessed: 15-Nov-2024].

[9]. Cleveland Clinic, "Lassa Fever," 2023, [Online]. Available: https://my.clevelandclinic.org/health/diseases/25095-lassa-fever. [Accessed: 15-Nov-2024].

[10]. Centers for Disease Control and Prevention (CDC), 2025, "Lassa Fever," [Online]. Available: https://www.cdc.gov/lassa-fever/about/index.html [Accessed: 15-Nov-2024].

[11]. Donnelly, C. A., et al., 2021, "Geographical drivers and climate-linked dynamics of Lassa fever in Nigeria," *Nature Communications*, [Online]. Available: https://www.nature.com/articles/s41467-021-25910-y. [Accessed: 15-Nov-2024].

[12]. Evans, S., 2023, "What Is Lassa Fever?", *WebMD*, [Online]. Available: https://www.webmd.com/a-to-z-guides/lassa-fever-overview. [Accessed: 15-Nov-2024].

[13]. Fabiyi, A., 1976, "Lassa fever (arenaviruses) as a public health problem," *PubMed*, [online]. Available: https://pubmed.ncbi.nlm.nih.gov/1026322/. [Accessed: 15-Nov-2024].

[14]. Hamblion, E. L., et al., 2018, "The challenges of detecting and responding to a Lassa fever outbreak in an Ebola-affected setting," *ScienceDirect*, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1201971217302898. [Accessed: 15-Nov-2024].

[15]. Ibrahim, M., 2018, "How 'Lassa,' a small Nigerian town, was stigmatized by having a killer virus named after it," *Nigeria Health Watch*, [Online]. Available: https://articles.nigeriahealthwatch.com/how-lassa-went-from-a-small-nigerian-town-to-a-well-known-virus/. [Accessed: 15-Nov-2024].

[16]. Ibekwe, T., 2012, "Lassa fever: the challenges of curtailing a deadly disease," *Pan African Medical Journal*, [Online]. Available: https://www.panafrican-med-journal.com/content/article/11/55/full/. [Accessed: 15-Nov-2024].

[17]. Idris, N., et al., 2020, "Preventive and control measures for Lassa fever through One Health approach," *SAGE Journals*, [Online]. Available: https://journals.sagepub.com/doi/pdf/10.1177/2010105820932616. [Accessed: 15-Nov-2024].

[18]. National Library of Medicine, 2023, "Lassa fever: Epidemiology, clinical features, and social consequences," *BMJ*, [Online]. Available: https://www.doi:10.1136/bmj.327.7426.1271. [Accessed: 15-Nov-2024].

[19]. Murphy, H. L., and Ly, H., 2021. "Pathogenicity and virulence mechanisms of Lassa virus and its animal modeling, diagnostic, prophylactic, and therapeutic developments," *Virulence*, 12(1), pp. 2989–3014. Available: https://doi.org/10.1080/21505594.2021.2000290. [Accessed: 20-Feb-2025].

[20]. Nigeria Center for Disease Control (NCDC), 2023, "Lassa Fever Public Health Advisory," [Online]. Available: https://ncdc.gov.ng/news/507/lassa-fever-public-health-advisory. [Accessed: 15-Nov-2024].

[21]. Reliefweb, 2019, "Lassa fever: A challenging disease to diagnose and treat," [Online]. Available: https://reliefweb.int/report/nigeria/lassa-fever-challenging-disease-diagnose-and-treat. [Accessed: 15-Nov-2024].

[22]. Richmond, J. K., and Baglole, D. J., 2003, "Lassa fever: epidemiology, clinical features, and social consequences," *National Center for Biotechnology Information*, [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC286250/. [Accessed: 15-Nov-2024].

[23]. Redding, D. W., et al., 2021, "Geographical drivers and climate-linked dynamics of Lassa fever in Nigeria," *Nature Communications*, vol. 12, Article no. 5759, [Online]. Available: https://www.nature.com/articles/s41467-021-26050-1. [Accessed: 15-Nov-2024].

[24]. Seladi-Schulman, J., 2018, "Everything you need to know about Lassa fever," *Medical News Today*, [Online]. Available: https://www.medicalnewstoday.com/articles/168266#Taking-a-temperature. [Accessed: 15-Nov-2024].

[25]. Starkman, E., 2023, "What Is Lassa Fever?", *WebMD*, [Online]. Available: https://www.webmd.com/a-to-z-guides/lassa-fever-overview. [Accessed: 15-Nov-2024].

[26]. Tambo, E., Adetunde, O. T., and Olalubi, O. A., 2018, "Re-emerging Lassa fever outbreaks in Nigeria: Re-enforcing 'One Health' community surveillance and emergency response practice," *Infectious Diseases of Poverty*, vol. 7, Article no. 37, [Online].Available: https://idpjournal.biomedcentral.com/articles/10.1186/s40249-018-0421-7. [Accessed: 15-Nov-2024].

[27]. United Nations Office for the Coordination of Humanitarian Affairs (OCHA), 2023, "NCDC Activates Lassa fever Emergency Operations Centre

to Strengthen the Response to Rising Cases of Lassa Fever in Nigeria," [Online]. Available: https://reliefweb.int/report/nigeria/ncdc-activates-lassa-fever-emergency-operations-centre-strengthen-ocha-response-rising-cases-lassa-fever-nigeria. [Accessed: 15-Nov-2024].

[28]. University of Texas Medical Branch News, 2023, "UTMB Study Shows Vaccine Rapidly Protects Against Lethal Lassa Fever Virus," *UTMB News*, [Online]. Available: https://www.utmb.edu/news/article/utmb-study-shows-vaccine-rapidly-protects-against-lethal-lassa-fever-virus. [Accessed: 15-Nov-2024].

[29]. World Health Organization (WHO), 2022, "Lassa Fever – Nigeria," *Disease Outbreak News*, [Online]. Available: https://www.who.int/emergencies/disease-outbreak-news/item/lassa-fever---nigeria. [Accessed: 15-Nov-2024].

[30]. World Health Organization (WHO), 2023, "Lassa Fever Fact Sheet," [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/lassa-fever. [Accessed: 15-Nov-2024].

[31]. Wikiwand (n.d.). *Lassa mammarenavirus*. [Image] Available at: https://www.wikiwand.com/en/articles/Lassa_mammarenavirus#/media/File:Lassa_Virus_(51719108882).jpg [Accessed 1 May 2025].

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Seroprevalence and Risk Factors of Hepatitis B virus Infection among People Living with HIV on Antiretroviral Treatment in Three Regions of Cameroon

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Abstract

Although the prevalence of Hepatitis B Virus (HBV) in people living with HIV (PLHIV) is high globally, it remains variable in different settings. Few studies have been conducted on Hepatitis B in PLHIV on antiretroviral treatment in Cameroon. This study sought to determine the seroprevalence and risk factors of HBV among PLHIV on antiretroviral treatment (ART) from three regions of Cameroon. This hospital-based cross-sectional study was conducted from June 2016 to April 2017 among PLHIV on ART in the Littoral, Northwest and Southwest regions of Cameroon. Participants' information was obtained using a questionnaire and a review of medical records. HBV seromarkers were diagnosed using immunochromatographic methods. Data was analysed using descriptive statistics and logistic regression models at a 95% CI and 5% significance level. HBV/HIV coinfection prevalence was 8.7% among 952 participants in the three regions, 9.4% in the Littoral, 7.5% in the Northwest, and 8.5% in the Southwest regions. Males had higher odds of coinfection (OR: 3.63, 95%CI: 0.080-16.50 p=0.09). Participants with secondary education were less likely to be HBsAg positive (OR=0.17, 95%CI: 0.02-0.93; p=0.042). Those with a history of tattooing had about four times more chances of coinfection (AOR: 3.4, 95% CI: 0.79-12.39, p=0.097). Among co-infected participants, HBsAb positivity was significantly associated with age (p=0.030), and HBeAg positivity with ALT (p=0.043) and AST levels (p=0.039). HBV/HIV coinfection was high among study participants. There is a need to routinely screen for HBV and its different seromarkers in PLHIV on antiretroviral treatment to improve the management of patients with coinfection and reduce complications and death from liver disease in PLHIV.

Keywords: *Cameroon, Coinfection, Hepatitis B Virus, People Living with HIV, Prevalence*.

Introduction

Infection with the Hepatitis B virus is a significant cause of chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma. About 10% of people with human immunodeficiency virus (HIV) are also infected with HBV, owing to their common transmission routes [1]. About 90% of HIV-infected persons have been positive for at least one HBV serologic marker; coinfection with chronic hepatitis is between 5%-40%. Mortality from liver disease is about 17 times higher in co-infected individuals than in those with HBV mono-infection [2]. In PLHIV, liver disease is a predominant cause of non-AIDS mortality, with about 13%–18% of all deaths attributed to a liver-related disease or condition [3]. HIV can infect different cells in the liver, causing enhanced intrahepatic

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apoptosis, activation, and fibrosis. HIV modifies the permeability of the gastrointestinal tract, causing increased volumes of lipopolysaccharide (LPS) circulating. Circulating polysaccharides can impair liver function by stimulating Kupffer cells (KCs) and human Stellate cells (HSCs) to produce proinflammatory cytokines and chemokines whose presence brings about activated lymphocytes and monocytes to the liver, increasing fibrosis [4]. Factors that influence the progression of liver disease in HIV/HBV coinfection include HBV, Intrahepatic HIV, gut, immune system, and clinical and HSC activation [5]. HIV induces immune suppression due to a decline in CD4+ T-cell counts, Immune activation, apoptosis in lymphocytes and hepatocytes, oxidative stress, inflammation, impaired immune responses, promotion of retroviral infection of HSC and Kupffer cells, and microbial translocation [6]. HBV may affect immunological and virological responses to ART in HIV-infected persons and increase the risk of hepatotoxicity [7].

With better access to effective antiviral therapy active against HIV and HBV and simplified treatment algorithms, treating co-infected patients has become more accessible [8]. However, it is still challenging in developing countries where access to HBV testing is not routine. According to WHO guidelines, PLHIV should be tested for HBsAg, HBcAbs, and anti-HBs. Those who are HBsAg positive should do quantitative HBV DNA and be screened for hepatitis delta antibodies [9]. Evidence shows that people with HIV/HBV coinfection should be placed on HIV antiviral therapy following diagnosis, irrespective of the clinical HIV stage or the CD4 count [10]. ART regimens in HBV/HIV patients should aim at high viral suppression rates of both HIV and Hepatitis B [11]. They should contain two agents with potent activity against HBV: four HIV antiretroviral medications are indicated. Reverse transcriptase inhibitors have activity against both viruses: Tenofovir, emtricitabine, and lamivudine [12]. Tenofovir-containing regimens are highly active against HBV. They also have a high genetic barrier for developing HBV drug resistance and are active against variants resistant to lamivudine- or emtricitabine [11].

Different studies conducted in Cameroon have shown different HBV/HIV coinfection prevalence. Bigna et al. 2018 reported a seroprevalence of hepatitis B in HIV-infected persons at 11.2% in Cameroon [13]. Other studies from Cameroon reported an HBV/HIV coinfection prevalence of 8.3% among adults starting antiretroviral treatment in 2010 [14]. In 2011, the Northwest Region reported a coinfection prevalence of 12.6%, while the Littoral Region reported a prevalence of 6.4% in 2014. in 2014 [16]. Increased access to treatment has contributed to higher life expectancy in PLHIV globally [17]. These gains are, however, threatened by the rising trends in liver disease-related deaths in PLHIV, with liver disease from hepatitis among the leading causes [18,19]. Although a few studies estimated the prevalence of HBV/HIV coinfection using HBsAg as a marker of HBV positivity [20-23], none had attempted to establish the serological profile of HBV/HIV co-infected persons. This study sought to add to existing knowledge on the prevalence of HBV in PLHIV on antiretroviral treatment, the distribution of HBV sero-markers in HIV/HBV coinfection and what factors favour coinfection in three regions of Cameroon.

Materials and Methods

Study Design

The study used a multicenter hospital-based cross-sectional design, conducted from June 2016 to April 2017 among people living with HIV/AIDS on antiretroviral treatment, attending the HIV care and treatment centres of 04 health facilities in three regions of Cameroon.

Setting

The study was conducted in three regions of Cameroon: The Littoral, Northwest, and Southwest Regions. Study participants were recruited between June 2016 and April 2017 from Nylon District Hospital and Laquintinie Hospital in the littoral Region. In the Northwest and Southwest regions, from the Bamenda Regional Hospital and the Buea Regional Hospital HIV Care and Treatment Centres, respectively. All selected sites were in the regional headquarters and had similar sociodemographic characteristics.

Study Population

The study population consisted of PLHIV on ART visiting the selected health facilities for routine follow-up, CD4+ T lymphocyte counts assessment, viral loads sample collection and results return, enhanced adherence counselling, and antiretroviral drug pick-up. Participants were recruited for the study through consecutive sampling. Participants were above 15 years old, and only those who provided signed informed consent or assent forms were enrolled in the study.

Sample Size

The study included multiple sites, and the formula below was used to calculate the minimum sample sizes for each health facility. The minimum sample size for the study was obtained by summing up the sample sizes for each health facility.

$$n' = \frac{n}{1 + \frac{z^2 \times \rho(1-\rho)}{\varepsilon^2 N}}$$

z is the z score, ε is the margin of error, N is the population size and, in this case, the number of PLHIV enrolled in the respective health facilities, HIV care, and treatment centres. ρ Is the population proportion for the area. We used N as 4000 for the Northwest and a population proportion of HBV/HIV coinfection of 12.6% [15]; N as 3500 with 6.1% coinfection prevalence in the southwest [24], and N as 7000 and 6000 for Laquintinie and Nylon district hospitals, with a prevalence of 6.4% in the Littoral [16]. A total of 952 PLHIV participated in the study.

Laboratory Analysis

Whole blood was collected into 5ml pre-labelled dry tubes for each participant. The tubes were allowed to stand for 15 to 30 minutes after collection, then centrifuged at 3000 rpm for 5 minutes, and the serum was collected for HBV sero-markers analysis and liver biochemistry test. The *DiaSpot* Hepatitis B Surface Antigen test strip (Hangzhou, China), a rapid one-step chromatographic immunoassay, was used to detect HBsAg qualitatively. Only reactive samples for hepatitis B surface antigen with DiaSpot Hangzhou, China, were analysed for other HBV sero-markers. Using a 05 parameters rapid screening test for Hepatitis B biomarkers by CTK BIOTECH, San Diego, USA, HBsAg positivity was confirmed and the presence of 04 other HBV confirmation of HBsAg positivity and detection of other HBV seromarkers; Hepatitis B surface antibody (HBsAb), Hepatitis B envelope antigen (HBeAg), Hepatitis B envelope antibody (HBeAb), and hepatitis B core antibody (HBcAb). Participants who were HBsAg positive were considered Hepatitis B positive. Participants were grouped as HIV only or HBV/HIV co-infected.

Data Collection and Statistical Analysis

Questionnaires were administered to collect information on sociodemographic characteristics and medical history. Sociodemographic data such as age, Sex, employment status, marital status, and HBV exposure history were obtained using a pre-tested questionnaire. Data on participant medical history, such as HIV ART regimen, duration of treatments, other health conditions, treatment adherence, and most recent HIV viral load results, were obtained from a review of medical records (Patient files) using an

information extraction form. All data collected was entered into an Excel file for later analysis. To reduce bias, all staff members who facilitated the study were trained. Questionnaires were pre-tested. The questionnaire was read out to clients who had low literacy levels.

Data obtained were keyed into a computer using Microsoft Excel 2016 (Microsoft Corporation, Inc., USA), cleaned, and analysed using the Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive statistics were used to summarise the data, and the association between sociodemographic variables and risk factors with HBV/HIV coinfection was determined using Fisher or chi-square statistics and the logistic regression models.

P-vales <5% were considered statistically significant.

Ethical Approval

Ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences of the University of Buea (Reference No: 2016/439/UB/FHS/IRB). The administrative authorisation was obtained from the Regional Delegation of the Ministry of Public Health in each Region and the health facility administration. A signed written consent or permission form was obtained from each participant after the purpose of the study was explained to them. The consent form was read and signed voluntarily.

Results

Characteristics of Study Participants

Table 1 shows that 952 PLHIV were enrolled in the study. The majority, 731(76.8%), were females compared to 221 (23.4%) for males. Self-employment in the informal sector was common (58.8%). About half of the participants consumed some form of alcohol (51.2%). A blood transfusion history and a history of tattooing were reported in 16.5% and 28.5% of participants, respectively. The mean CD4+T-lymphocytes count ±SD in the study was 448±260 cells/mm3.

HBV Seroprevalence in PLHIV on ART in the Study

Of the 952 study participants enrolled from all three regions between June 2016 and April 2017, 83 were positive for HBsAg, making an HBV/HIV coinfection prevalence of 8.7 (8.7%: 95% CI: 7.1–10.7%) (Figure 1).

The mean age (±SD) was 41.3(±10.4) years, with most participants in the age groups 31 to 40 years 316(33.2%) and 41 to 50 years 317(33.3). Most participants were married 408, 41.3% and had at least a secondary school level of education.

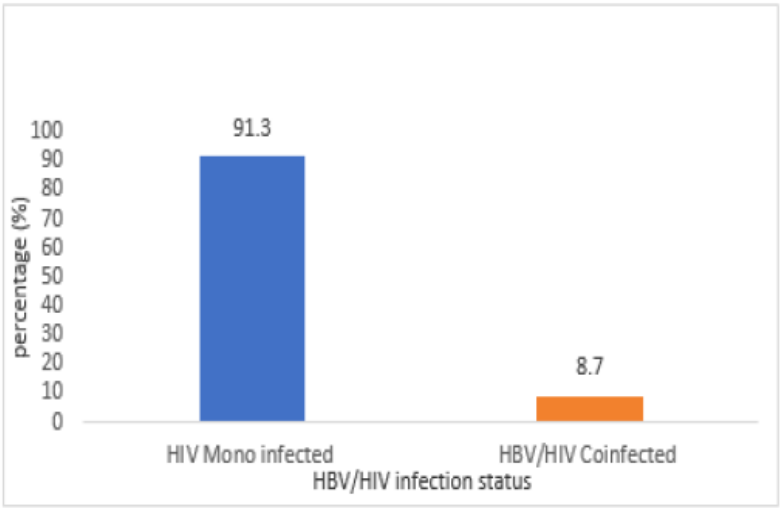

Figure 1. Prevalence of HBV among PLHIV on ART in the Littoral, Northwest, and Southwest regions of Cameroon, 2016- 2017

Table 1. Characteristics of PLHIV on ART from the littoral, Northwest and Southwest regions of Cameroon 2016- 2017

Characteristic		**Frequency (N=952)**	**Percentage (%)**
Sex	Female	731	76.8
	Male	221	23.2
Age group	<31 years	109	11.5
	31-40 years	316	33.2
	41-50 years	317	33.3
	51-60 years	171	18
	>60 years	39	4.1
Marital status	Divorced	36	3.8
	Married	408	41.3
	Single	360	37.8
	Widowed	148	15.5
Educational level	Informal	31	3.3
	Primary	368	38.7
	Secondary	480	50.4
	Tertiary	73	7.7
Occupation	Employed	168	17.6
	Retired	6	0.6
	Self-employed	560	58.8
	Unemployed	218	21.3
Smoking	No	900	94.5
	Yes	52	5.5
Alcohol consumption	No	456	47.9
	Yes	496	51.2.1
blood transfusion	No	795	83.5
	Yes	157	16.5
History of Tattooing	No	289	71.5
	Yes	115	28.5
	<200 cells/µl	97	14.8
	200-350 cells/µl	150	21.3
	>350 cells/µl	408	61.2
Duration of ART treatment	< 1 year	49	5.2
	1-4 years	362	38.0
	5-9 years	326	34.2
	≥ 10 years	215	22..6
Region of residence	Littoral	524	55.0
	Northwest	200	21.0
	Southwest	228	23.9

HBV Seroprevalence in PLHIV on ART by Region

The prevalence by region was 9.4 % in the Littoral region, 7.5% in the Northwest, and 8.5% in the Southwest (Figure 2).

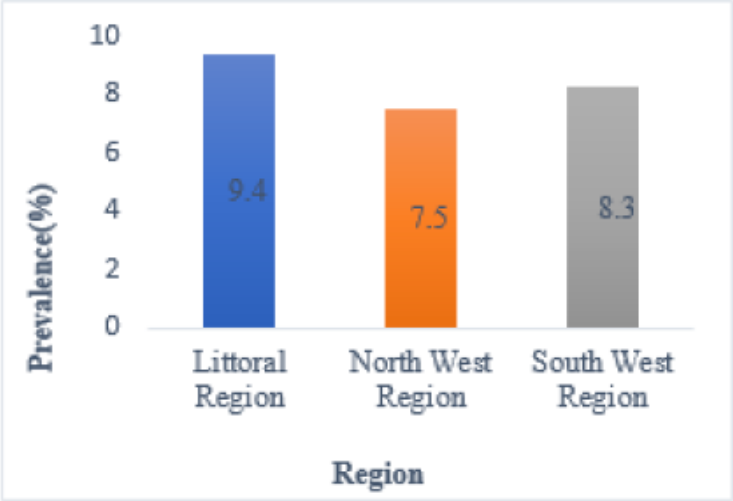

Figure 2. HBV/HIV coinfection prevalence in PLHIV on ART by region; Littoral Northwest and Southwest regions of Cameroon.

Prevalence of HBV Sero-markers in HBV/HIV Co-infected Study Participants

Among the 83 HBV/HIV co-infected participants from all three regions (Littoral, Northwest and Southwest), 8 participants (9.6%) were positive for HBsAb (95% CI: 3.3–15.9%). This implies that 08 participants had HBsAg/HBsAb simultaneously, as all 83 study participants were HBsAg positive, 6 participants (7.2%) were positive for HBeAg (95% CI: 1.6–11.2.8%), 33 participants (39.8%) were positive for HBeAb (95% CI: 29.3–50.3%), and 41 participants (49.4%) were positive for HBcAb (95% CI: 38.6–60.2%) (Figure 3).

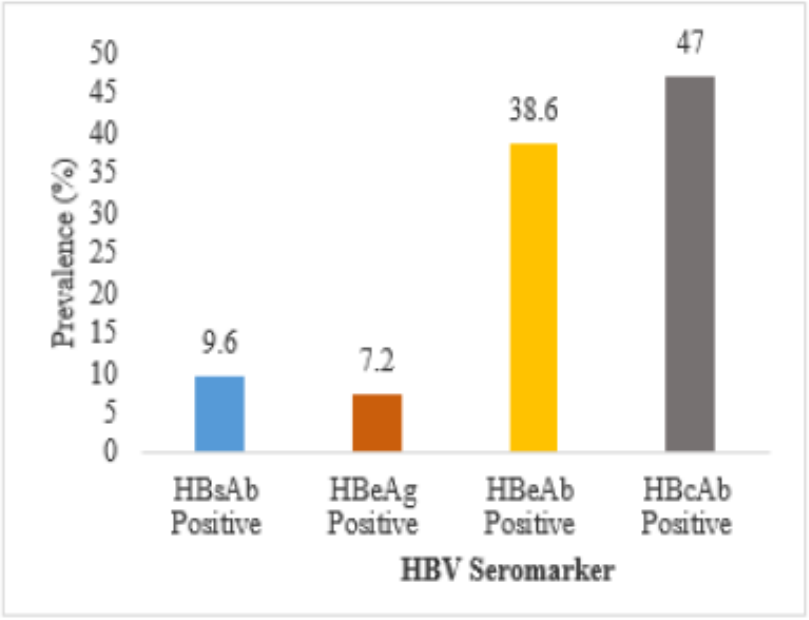

Figure 3. Prevalence of HBsAb, HBeAb, HBeAg, and HBcAb among HBV/HIV co-infected participants in the Littoral Northwest and Southwest Regions of Cameroon, 2016-2017

Factors Associated with HBV Coinfection in PLHIV on ART

The prevalence of HBV/HIV coinfection in females was 6.7% compared to 15.4% in males. Males were about four times more likely to have HBV than females. This difference was, however, found to be insignificant after adjusting for confounding variables (AOR: 3.63, 95% CI: 0.80-16.50, p=0.095). Older participants were more likely to be co-infected than those below 31, although the association was insignificant. Participants with at least a secondary school level of education had lower odds for HBV/HIV coinfection when compared to those with had not received education and those who went ended their education at primary school (AOR:0.13, 95% CI: 0.02-0.93, p = 0.042). Participants with a history of tattooing had about three times more chances of HBV/HIV coinfection (AOR: 3.4, 95% CI: 0.79-12.39, p = 0.097; Table 2). Regarding the duration of antiretroviral treatment (ART), although the association was not significant, participants who were less than one year on ART were more likely to be co-infected than those who had been longer on ART (AOR:1.67, 95% CI: 0.08-34.16, p = 0.739).

Table 2. Logistic regression of factors associated with HBV/HIV coinfection in PLHIV on ART in the Littoral, Northwest and Southwest regions of Cameroon

Variable		HIV -only n(%)	HBV/HIV n(%)	Crude OR	95% CI	p-value	Adjusted OR	95% CI	p-value
Sex	Female	682(93.3)	49(6.7)	1.00	-	-	1.00	-	-
	Male	187(84.6)	34(15.4)	2.53	1.59-4.04	<0.001	3.63	0.80-16.50	0.095
	Total	869(91.3)	83(8.7)						
Age group	<31 years	96(88.1)	13(11.9)	1.00	-	-	1.00	-	-
	31-40 years	292(92.4)	24(7.6)	0.61	0.30-1.24	0.170	0.80	0.06-10.69	0.864
	41-50 years	287(90.5)	30(9.5)	0.77	0.39-1.54	0.463	2.85	0.28-28.55	0.373
	51-60 years	159(93.0)	12(7.0)	0.56	0.24-1.27	0.165	2.74	0.24-31.03	0.416
	>60 years	35(89.7)	4(10.3)	0.84	0.26-2.76	0.779	5.15	0.14-185.45	0.370
	Total	869(91.3)	83(8.7)						
Marital status	Single	326(90.6)	34(9.4)	1.00	-	-	1.00	-	-
	Married	377(92.4)	31(7.6)	0.79	0.47-1.31	0.360	0.20	0.04-1.03	0.054
	Divorced	30(83.3)	6(16.7)	1.92	0.75-4.93	0.177	-	-	-
	Widowed	136(91.9)	12(8.1)	0.85	0.43-1.68	0.634	0.53	0.09-3.06	0.481
	Total	869(91.3)	83(8.7)						
Educational level	Informal	25(80.6)	6(19.4)	1.51	0.50-4.60	0.467	0.99	0.04-22.38	0.996
	Primary	339(92.1)	29(7.9)	0.54	0.25-1.16	0.114	0.52	0.08-3.43	0.496
	Secondary	442(92.1)	38(7.9)	0.54	0.26-1.14	0.107	0.13	0.02-0.93	0.042
	Tertiary	63(86.3)	10(13.7)	1.00	-	-	1.00	-	-
	Total	869(91.3)	83(8.7)						
Occupation	Employed	153(91.1)	15(8.9)	1.00	-	-	1.00	-	-
	Retired	6(100.0)	0(0.0)	-	-	-	-	-	-
	Self-employed	510(91.1)	50(8.9)	1.00	0.55-1.83	1.000	2.44	0.42-14.16	0.319

	Unemployed	200(91.7)	18(8.3)	0.92	0.45-1.88	0.815	2.59	0.40-16.72	0.318
	Total	869(91.3)	83(8.7)						
Smoking	No	823(91.4)	77(8.6)	1.00	-	-	1.00	-	-
	Yes	46(88.5)	6(11.5)	1.39	0.58-3.37	0.460	1.45	0.05-38.17	0.824
	Total	869(91.3)	83(8.7)						
Alcohol consumption	No	409(89.7)	47(10.3)	1.00	-	-	1.00	-	-
	Yes	460(92.7)	36(7.3)	0.68	0.43-1.07	0.097	0.27	0.07-1.09	0.066
	Total	869(91.3)	83(8.7)						
History of blood transfusions	No	724(91.1)	71(8.9)	1.00	-	-	1.00	-	-
	Yes	145(92.4)	12(7.6)	0.84	0.45-1.60	0.602	0.12	0.01-1.48	0.099
	Total	869(91.3)	83(8.7)						
History of Tattooing	No	263(91.0)	26(9.0)	1.00	-	-	1.00	-	-
	Yes	102(88.7)	13(11.3)	1.29	0.64-2.61	0.479	3.14	0.79-12.39	0.097
	Total	869(91.3)	83(8.7)						
CD4+ T cell count	<200 cells/µl	86(88.7)	11(11.3)	1.74	0.83-362	0.142	0.90	0.13-6.41	0.913
	200-350 cells/µl	132(88.0)	18(12.0)	1.85	0.99-3.46	0.053	1.60	0.38-6.70	0.518
	>350 cells/µl	380(93.1)	28(6.9)	1.00	-	-	1.00	-	-
	Total	869(91.3)	83(8.7)						
Duration of ART treatment	< 1 year	41(83.7)	8(16.3)	2.14	0.87-5.24	0.300	1.67	0.08-34.16	0.739
	1-4 years	331(91.4)	31(8.6)	1.03	0.56-1.88	0.936	0.60	0.11-3.45	0.570
	5-9 years	300(92.0)	26(8.0)	0.95	0.51-1.78	0.869	0.49	0.11-2.20	0.352
	≥ 10 years	197(91.6)	18(8.4)	1.00	-	-	1.00	-	-
	Total	869(91.3)	83(8.7)						
Region of Residence	Littoral	475(90.6)	49(9.4)	1.14	0.65-1.98	0.655	-	-	-
	Northwest	185(92.5)	15(7.5)	0.89	0.44-1.81	0.751	-	-	-
	Southwest	209(91.7)	19(8.3)	1.00	-	-	1.00	-	-
	Total	869(91.3)	83(8.7)						

Factors Associated with HBV Sero-markers in HBV/HIV Co-infected Participants on ART

As shown in Table 3, the study found no association between HBV sero-markers in HBV/HIV co-infected participants and factors like Sex, employment status, marital status, Alcohol consumption, a history of tattooing, blood transfusion, and CD4+ T cells count at 95% CI. There was a significant association between Age and HBsAb positivity, with fewer participants in the age group above 60 having HBsAbs (P=0.030). HBeAb positivity and HBcAb positivity were related to the Region of the study, P<001 for both sero-markers. The study also found that Liver enzymes ALT and AST were associated with HBeAg and HBcAb positivity among study participants, P=0.043 and P=0.039, respectively, for ALT and P=0.001 and P=0.018 for AST.

Table 3. Factors associated with HBV sero-markers in HBV/HIV co-infected persons on ART in the Littoral, Northwest and Southwest regions of Cameroon 2016-2017

Variables		**Total**	**HBsAb Positive n (%)**	**HBeAg Positive n (%)**	**HBeAb Positive n (%)**	**HBcAb Positive n (%)**
Total	Co-infected	83(100%)	08 (9.6)	06 (7.2)	32(38.6)	39 (47.0)
			$\chi2$ =4.108, p-value = 0.061	$\chi2$ =0.199, p-value = 0.701	$\chi2$ =0.040, p-value = 0.842	$\chi2$ =3.878, p-value = 0.071
Sex	Male	34 (41.0)	06 (17.6)	02 (5.9)	13 (38.2)	12 (35.3)
	Female	48 (59.0)	02 (4.2)	04 (8.5)	19 (40.4)	27 (57.4)
			$\chi2$ = 3.907, p-value = 0.372	$\chi2$ = 2.796, p-value = 0.570	$\chi2$ = 5.053, p-value = 0.270	$\chi2$ = 3.062, p-value = 0.559
Age	<31 years	13 (15.7)	1 (7.7)	02 (16.7)	08 (66.7)	08 (66.7)
	31-40 years	24 (28.9)	04 (17.7)	01 (4.3)	09 (39.1)	12 (52.2)
	41-50 years	30 (36.1)	01 (3.3)	03 (10.0)	09 (30.0)	13 (43.3)
	51-60 years	12 (14.5)	02 (16.7)	0 (0.0)	05 (41.7)	05 (41.7)
	>60 years	04 (4.8)	0 (0.0)	00 (0.0)	01 (25.0)	01 (25.0)
			$\chi2$ = 8.941, p-value = 0.030	$\chi2$ = 2.158, p-value = 0.54	$\chi2$ = 5.053, p-value = 0.272	$\chi2$ = 3.208, p-value = 0.544
Academic Qualification	Informal	06 (7.2)	0 (0.0)	0 (0.0)	2 (33.3)	3 (50.0)
	Primary	29 (34.9)	2 (6.9)	1 (3.4)	9 (31.0)	10 (34.5)
	Secondary	38 (45.8)	3 (8.1)	5 (13.9)	16 (44.4)	20 (55.6)
	Tertiary	10 (12.0)	3 (30.0)	0 (0.0)	5 (50.0)	6 (60.0)
			$\chi2$ = 4.200, p-value = 0.183	$\chi2$ =2.656, p-value = 0.370	$\chi2$ =1.879, p-value = 0.638	$\chi2$ =3.591, p-value = 0.315
Marital Status	Single	52 (62.7)	5 (9.8)	3 (6.0)	22 (44.0)	26 (52.0)
	Married	31 (37.3)	3 (9.7)	3 (9.7)	10 (32.3)	13 (41.9)
			$\chi2$ = 0.00, p-value = 0.650	$\chi2$ =0.377, p-value = 0.419	$\chi2$ = 1.104, p-value = 0.208	$\chi2$ = 0.776, p-value = 0.257
Employment Status	Employed	15 (18.1)	3 (20.0)	1 (6.7)	7 (46.7)	7 (46.7)
	Self-Employed	50 (60.2)	3 (6.1)	2 (4.2)	18 (37.5)	21 (43.8)
	Unemployed	18 (21.7)	2 (11.1)	3 (16.7)	7 (38.9)	11 (61.1)
			$\chi2$ = 2.750, p-value = 0.185	$\chi2$ =2.923, p-value = 0.187	$\chi2$ = 0.484, p-value = 0.776	$\chi2$ = 1.605, p-value = 0.502
Smoking	Yes	06 (7.2)	07 (9.2)	06 (7.9)	31 (40.8)	37 (48.7)
	No	77 (92.8)	01 (16.7)	0 (0.0)	01 (20.0)	2 (40.0)
			$\chi2$ = 0.351, bp-value = 0.471	$\chi2$ =0.426, p-value < 0.674	$\chi2$ = 0.848, p-value = 0.339	$\chi2$ = 0.142, p-value = 0.536

Variables		Total	HBsAb Positive n (%)	HBeAg Positive n (%)	HBeAb Positive n (%)	HBcAb Positive n (%)
Alcohol Consumption	Yes	36 (43.4)	2 (4.3)	4 (8.5)	17 (36.2)	22 (46.6)
	No	47 (56.6)	6 (17.1)	2 (5.9)	15 (44.1)	17 (50)
			$\chi2 = 3.784$, p-value = 0.590	$\chi2 = 0.199$, p-value = 0.502	$\chi2 = 0.521$, p-value = 0.311	$\chi2 = 0.080$, p-value = 0.477
Blood Transfusion	Yes	12 (14.5)	08 (11.4)	05 (7.1)	29 (41.4)	34 (48.6)
	No	71 (85.5)	0 (0.0)	01 (9.1)	03 (27.3)	05 (45.5)
			$\chi2 = 1.520$, p-value = 0.265	$\chi2 = 0.053$, p-value = 0.596	$\chi2 = 0.797$, p-value = 0.293	$\chi2 = 0.037$, p-value = 0.553
History of Tattooing	Yes	13 (15.7)	06 (23.1)	0 (0.0)	12 (46.2)	18 (69.2)
	No	26 (31.3)	01 (7.7)	02 (16.7)	08 (66.7)	10 (83.3)
			$\chi2 = 1.393$, p-value = 0.237	$\chi2 = 4.574$, p-value = 0.094	$\chi2 = 1.386$, p-value = 0.205	$\chi2 = 0.842$, p-value = 0.309
CD4+ T cell Count	<200 cells/µl	12 (14.5)	01 (8.3)	0 (0.0)	01 (8.3)	01 (8.3)
	200-350 cells/µl	17 (20.5)	02 (12.5)	01 (6.3)	07 (43.8)	0.8 (50.0)
	>350 cells/µl	28 (33.7)	0 (0.0)	03 (10.7)	10 (35.7)	12 (42.9)
			$\chi2 = 3.639$, p-value = 0.118	$\chi2 = 1.080$, p-value = 0.802	$\chi2 = 4.344$, p-value = 0.120	$\chi2 = 5.978$, p-value = 0.064
Line of ART	First Line	74 (89.2)	07 (9.6)	05 (6.9)	28 (38.9)	33 (45.8)
	Second Line	09 (10.8)	01 (11.1)	01 (11.1)	04 (44.4)	06 (66.7)
			$\chi2 = 0.021$, p-value = 0.623	$\chi2 = 0.203$, p-value = 0.519	$\chi2 =0.103$, p-value = 0.508	$\chi2 = 1.127$, p-value = 0.369
Knowledge of HBV Status	Yes	12 (14.5)	07 (10.0)	6 (8.7)	26 (37.7)	33 (47.8)
	No	71 (85.5)	01 (8.3)	0 (0.0)	06 (50.0)	06 (50.0)
			$\chi2 = 0.032$, p-value = 0.668	$\chi2 = 1.127$, p-value = 0.369	$\chi2 = 0.649$, p-value = 0.310	$\chi2 = 0.019$, p-value = 0.568
ALT	Normal	50 (60.2)	04 (12.1)	0 (0.0)	07 (21.9)	8 (25.0)
	High	33 (39.8)	04 (8.2)	06 (12.2)	25 (51.0)	31 (63.3)
			$\chi2 = 0.351$, p-value = 0.409	$\chi2 = 4.232$, p-value = 0.043	$\chi2 = 0.021$, p-value = 0.623	$\chi2 = 11.353$, p-value = 0.001
AST	Normal	34 (41.0)	04 (8.2)	01 (2.1)	18 (37.5)	18 (37.5)
	High	49 (59.0)	04 (12.1)	5 (15.2)	14 (42.4)	21 (63.6)
			$\chi2 = 0.351$, p-value = 0.409	$\chi2 = 4.869$, p-value < 0.039	$\chi2 = 0.198$, p-value = 0.414	$\chi2 = 5.351$, p-value = 0.018

Discussion

An HBV/HIV coinfection prevalence of 8.7% was obtained from the 952 participants enrolled in the study. This result supports previous findings from Mathews et al. (2014) in a data review of HIV/ Hepatitis coinfection in people living with HIV, which estimates prevalence between 6 and 25% in sub-Saharan Africa [25]. In other studies in Cameroon, a prevalence of 8.9% was reported by Molu et al. in HIV-infected patients starting treatment in Mfou, a rural health district setting [26]. On the other hand, Bigna et al. reported a higher HBV prevalence of 12.9% in HIV-infected persons from 7 out of 10 regions of Cameroon [13]. Differences in sample size selection may explain the difference in results. Prevalence of 9.4%, 7.5%, and 8.5% were recorded in the Littoral, Northwest, and Southwest regions, respectively. Although the difference in prevalence was insignificant, it was higher in the Littoral Region with greater odds for coinfection (OR: 1.14, 95% CI: 0.65-1.98). This result is likely because Littoral is the socioeconomic capital of Cameroon, a melting point of different socioeconomic classes, with risk behaviour that may favour horizontal transmission of STIs, including HBV. HBV and HIV have shared routes of transmission and some common risk factors, and this can explain the high coinfection prevalence in the different studies [27].

In this study, there was no significant association between Sex and HBV/HIV coinfection. However, males were more likely to be co-infected than females, 15.4% and 6.7% respectively. This result is comparable to that of a study of PLHIV in Nigeria, where Diwe et al. also found no association between Sex and HBV/HIV coinfection [28]. On the other hand, Akindigh et al. (2019) found that there is a strong association between male Sex and HBV/HIV coinfection in another study in Nigeria [29]. In Cameroon, Assob et al. also observed no significant association between Sex and HBV infection in PLHIV [16], while Luma et al. (2016) found evidence of an association between Sex, opportunistic infections and multiple sexual partners with coinfection [24]. Differences in findings may be due to the epidemiologic settings and sample sizes.

Though no significant association was observed between CD4+T-Lymphocyte count and HBV coinfection in this study, HBV/HIV coinfection prevalence was higher in participants with lower CD4+ T-Lymphocyte counts, less than 200 cells/mm3 (11.3%) and 200 to 350 cells/mm3 (12%), respectively. Moreover, those with CD4+T-Lymphocyte counts between 200-350 cells/mm3 were more likely to be co-infected. Rana et al. argued that people with HIV/HBV coinfection have lower CD4 T cell counts and higher mortality [30]. Molu et al. also found that coinfection with HBV was higher in patients with low CD4+ count in Cameroon; however, this difference was insignificant [26]. Although reasons for this association may vary, Sarmati and Malagnino have argued that coinfection affects the "viral-immunological status" of people with coinfection, which can lead to decreased CD4+T-lymphocytes and recovery. They also associate low CD4 count with an increased risk of liver fibrosis and increasing mortality in co-infected persons [31].

Higher coinfection rates were observed for PLHIV who had been on antiretroviral treatment for less than one year (14.3%) compared to those with more prolonged treatment. However, the relationship between the duration of treatment and HBV/HIV coinfection was not significant. The presence of HBsAg in participants with different durations of treatment suggests new HBV infection in HIV-infected patients on ART. A study in Uganda found a high prevalence of HBV in PLHIV naive or on ART [32]. Findings from this study reinforce the need to screen for Hepatitis B markers routinely in HIV-infected persons and follow national guidelines on managing HBV/HIV coinfection to reduce morbidity and mortality.

The prevalence of HBsAb was 9.6% among the 83 HBV/HIV co-infected participants. PLHIV have been observed to have lower

HBsAb rates. There is a need to scale up efforts to increase HBsAb-positive rates among HIV patients to prevent horizontal transmission [33]. Previously, HBsAg/HBsAb coexistence was uncommon. However, occurrence has increased with vaccine promotion and the use of different antiretroviral, as well as improvements in medical diagnostic techniques. Other factors that may favour this coexistence include Host immune status, the mutation in the viral genome, or host genetic factors [34]. HBeAg and HBeAb prevalence were 7.2% and 39.8% in HBV/HIV co-infected participants. In a similar study in Brazil, of 21 HIV-positive participants, 7 (33.3%) had HBeAg, and 9 (42.9%) had anti-HBe. [35]. HIV coinfection substantially decreases the rate of hepatitis B e antigen (HBeAg) clearance by up to fivefold. It increases the risk of HBV DNA replication and reverses the conversion from HBsAb status to HBsAg. [2]. The prevalence of HBcAb was high among participants (49.4%). HBcAb has been associated with a delay in HIV viral suppression to undetectable levels and poor HIV treatment outcomes in co-infected patients [36].

Among HBV/HIV co-infected participants, the presence of HBsAb was not significantly associated with coinfection status. Although more males (06) than females (02) were HBsAb positive, the association was insignificant. However, a significant association was obtained between the Age group and HBsAb. A study in Korea reported variations in the prevalence of HBsAb among participants according to birth year within different cohorts and among HIV study participants less than 30 years old. Despite implementing immunisation programs, it obtained an HBsAb prevalence of 58.1%, suggesting that HBsAb positivity does not persist in protective titters in PLHIV even after complete HBV vaccination [32].

HBeAg seropositivity in HBV/HIV coinfection was associated with liver enzyme levels: ALT (P=0.043) and AST (P=0.039). HBeAg positivity is a marker of HBV replication [37]. A study in Nigeria suggested that HBeAg may be responsible for elevated ALT levels and that HBV infection causes changes in liver enzymes [38]. However, variants of HBV with pre-core and BCP mutation have led to an increasing incidence of HBeAg-negative chronic HBV with higher ALT levels than those with HBeAg-positive [39]. In this study, HBeAb(P=0.001) and HBcAb (P=0.001) were associated with region. HBeAb indicates HBeAg seroconversion or HBV treatment endpoint, and HBcAb implies current or past HBV infection [40]. It implies that HBV endemicity variations will likely affect both markers' prevalence. Although in this study, HBcAb was associated with ALT and AST levels, P=0.001 and P=0.018, respectively, Ikeda et al. argue that variations in ALT could be mainly a result of factors like high intake of alcohol or obesity rather than with HBV infection; thus, ALT cannot be used as a surrogate marker of HBV infection [41]. ALT was more likely to be associated with lifestyle factors. Therefore, ALT may be excluded as a surrogate marker of HBV.

Limitations of the Study

This study did not establish if participants had Hepatitis B before starting HIV treatment or while already on treatment. As a result, the incidence of HBV in people on antiretroviral treatment cannot be determined. Information on Viral load and CD4+ T-Lymphocyte counts was missing for some study participants, and this could introduce biased conclusions on associations with CD4+T-Lymphocyte counts and viral loads.

Conclusion

This study reported high HBV/HIV coinfection rate among study participants, further strengthening the need to routinely screen for HBV and its different sero-markers in PLHIV on antiretroviral treatment. This will improve the management of patients with HBV/HIV coinfection and reduce complications and mortality from liver disease in PLHIV.

What is Already known on this Topic?

The prevalence of Hepatitis B in PLHIV is higher than that of the general population.

HIV and Hepatitis B have similar modes of transmission.

What this Study Adds

It highlights the necessity for routine screening of Hepatitis B in people living with HIV, even on antiretroviral treatment with a Tenofovir-based regimen. It also estimates the HBV/HIV coinfection prevalence in people living with HIV on antiretroviral treatment in three regions of Cameroon, and findings from this study could strengthen policy implementation on routine HBV screening among HIV-infected persons attending care and treatment centres in Cameroon for routine follow-up and antiretroviral drug pick-up.

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Authors' Contribution

Sandrine Donfack Mewoabi Contributed to the research's conception, design and conduct. Valantine Ngum Ndze contributed to the design and review of the first draft of the manuscript, Njouendou Abdel Jelil, contributed to the statistical analysis, Theresa Nkuo-Akenji and Nguedia Jules Clement Assob Supervised the work. All authors read and approved the final manuscript**.**

Competing Interests

The authors declare no competing interests.

Data Availability

The primary research data collected from this study can be obtained by an email request to the corresponding author.

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References

[1]. Cheng, Z., Lin, P., & Cheng, N., 2021, HBV/HIV Coinfection: Impact on the Development and Clinical Treatment of Liver Diseases. *Frontiers in Medicine*, 8(October), 1–15. https://doi.org/10.3389/fmed.2021.713981

[2]. Parvez, M. K.,2015, HBV and HIV coinfection: Impact on liver pathobiology and therapeutic approaches. *World Journal of Hepatology*, ***7***(1), 121. https://doi.org/10.4254/WJH.V7.I1.121

[3]. Kaspar, M. B., & Sterling, R. K., 2017, Mechanisms of liver disease in patients infected with HIV. *BMJ open gastroenterology*, *4*(1), e000166. https://doi.org/10.1136/bmjgast-2017-000166

[4]. Crane, M., Iser, D., & Lewin, S. R., 2012, Human immunodeficiency virus infection and the liver. *World Journal of Hepatology*, **4**(3), 91-98. https://doi.org/10.4254/WJH.V4.I3.91

[5]. Corsa, A. C., Liu, Y., Flaherty, J. F., Mitchell, B., Fung, S. K., Gane, E., Miller, M. D., & Kitrinos, K. M., 2014, No Resistance to Tenofovir Disoproxil Fumarate Through 96 Weeks of Treatment in Patients with Lamivudine-Resistant Chronic Hepatitis B. *Clinical Gastroenterology and Hepatology*, 12(12), 2106-2112.e1. https://doi.org/10.1016/j.cgh.2014.05.024

[6]. Ganesan, M., Poluektova, L. Y., Kharbanda, K. K., & Osna, N. A., 2019, Human immunodeficiency virus and hepatotropic viruses comorbidities as the inducers of liver injury progression. *World Journal of Gastroenterology*, **25**(4), 398–410. https://doi.org/10.3748/wjg.v25.i4.398

[7]. Yang, R., Gui, X., Xiong, Y., Gao, S., & Yan, Y., 2014, Impact of hepatitis B virus infection on HIV response to antiretroviral therapy in a Chinese antiretroviral therapy center. *International Journal of Infectious Diseases*, 28, 29–34. https://doi.org/10.1016/j.ijid.2014.07.018.

[8]. Dharel, N., & Sterling, R. K., 2014, Hepatitis B virus-HIV coinfection: Forgotten but not gone. *Gastroenterology and Hepatology*, 10(12), 780–788.

[9]. Health Organization Regional Office for Europe., 2011, Management of hepatitis B and HIV coinfection. Clinical protocol for the WHO European Region (2011 revision)., *Geneva: WHO*; p. 31.

[10]. Zhou, K., & Terrault, N., 2017, Management of hepatitis B in special populations. *Best Practice and Research: Clinical Gastroenterology*, 31(3), 311–320. https://doi.org/10.1016/j.bpg.2017.06.002

[11]. Kim, H. N., & David H. Spach., 2021, Hepatitis B Coinfection. National HIV Curriculum. *National HIV*. Figure 4, 1–46. https://www.hiv.uw.edu/go/co-occurring-conditions/hepb-coinfection/core-concept/all

[12]. DHHS, 2019, Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV. October 2019; 13:1–334.

[13]. Bigna, J. J., Nkeck, J. R., Ngouo, A., Nyaga, U. F., & Noubiap, J. J., 2018, Hepatitis B virus and HIV coinfection among adults residing in Cameroon: A systematic review and meta-analysis of prevalence studies. *Infection, disease & health*, 23(3), 170–178. https://doi.org/10.1016/j.idh.2018.02.006

[14]. Laurent, C., Bourgeois, A., Mpoudi-Ngolé, E., Kouanfack, C., Ciaffi, L., Nkoué, N., et al., 2010, High rates of active hepatitis B and C coinfections in HIV-1 infected Cameroonian adults initiating antiretroviral therapy. *HIV medicine*, 11(1), 85–89. https://doi.org/10.1111/j.1468-1293.2009.00742.x

[15]. Zoufaly, A., Onyoh, E. F., Tih, P. M., Awasom, C. N., & Feldt, T., 2012, High prevalence of hepatitis B and syphilis coinfections among HIV patients initiating antiretroviral therapy in the northwest region of cameroon. *International Journal of STD and AIDS*, 23(6), 435–438. https://doi.org/10.1258/ijsa.2011.011279

[16]. Assob, J. C. N., Palle, J. N., Nsagha, D. S., Mewoabi, S. D., & Mbukam, E. C., 2014, Variation of CD4+ T-Lymphocyte Counts and Transaminases in HIV and HIV/HBV Co-infected Patients on Therapy at Nylon Hospital Douala, Cameroon. *International Journal of Tropical Disease and Health*, 4(8), 947–955. https://doi.org/10.9734/IJTDH/2014/9662

[17]. Wandeler, G., Gsponer, T., Bihl, F., Bernasconi, E., Cavassini, M., Kovari, H., et al., 2013, Hepatitis B virus infection is associated with impaired immunological recovery during antiretroviral therapy in the Swiss HIV cohort study. *Journal of Infectious Diseases*, 208(9), 1454–1458. https://doi.org/10.1093/infdis/jit351

[18]. Shiferaw, M. B., Tulu, K. T., Zegeye, A. M., & Wubante, A. A., 2016, Liver Enzymes Abnormalities among Highly Active Antiretroviral Therapy Experienced and HAART Naive HIV-1 Infected Patients at Debre Tabor Hospital, North West Ethiopia: A Comparative Cross-Sectional Study. *AIDS research and treatment*, 2016, 1985452. https://doi.org/10.1155/2016/1985452

[19]. Farahani, M., Mulinder, H., Farahani, A., & Marlink, R., 2017. Prevalence and distribution of non-AIDS causes of death among HIV-infected individuals receiving antiretroviral therapy: a systematic review and meta-analysis. *International journal of STD & AIDS*, 28(7), 636–650. https://doi.org/10.1177/0956462416632428

[20]. Kouanfack, C., Aghokeng, A. F., Mondain, A. M., Bourgeois, A., Kenfack, A., Mpoudi-Ngolé, E., Ducos, J., Delaporte, E., & Laurent, C., 2012, Lamivudine-resistant HBV infection in HIV-positive patients receiving antiretroviral therapy in a public routine clinic in Cameroon. *Antiviral Therapy*, 17(2), 321–326. https://doi.org/10.3851/imp1911

[21]. Noubiap, J. J., Nansseu, J. R., Ndoula, S. T., Bigna, J. J., Jingi, A. M., & Fokom-Domgue, J., 2015, prevalence, infectivity and correlates of hepatitis B virus infection among pregnant women in a rural district of the Far North Region of Cameroon. *BMC public health*, 15, 454. https://doi.org/10.1186/s12889-015-1806-2

[22]. Magoro, T., Gachara, G., Mavhandu, L., Lum, E., Kimbi, H. K., Ndip, R. N., & Bessong, P., 2016, Serologic and genotypic characterization of hepatitis B virus in HIV-1 infected patients from South West and Littoral Regions of Cameroon. *Virology journal*, 13(1), 178. https://doi.org/10.1186/s12985-016-0636-x

[23]. Bigna, J. J., Amougou, M. A., Asangbeh, S. L., Kenne, A. M., Noumegni, S. R. N., Ngo-Malabo, E. T., & Noubiap, J. J., 2017. Seroprevalence of hepatitis B virus infection in Cameroon: a systematic review and meta-analysis. *BMJ open*, 7(6), e015298. https://doi.org/10.1136/bmjopen-2016-015298

[24]. Luma, H. N., Eloumou, S. A. F. B., Ekaney, D. S. M., Lekpa, F. K., Donfack-Sontsa, O., Ngahane, B. H. M., & Mapoure, Y. N., 2016, Sero-prevalence and Correlates of Hepatitis B and C Coinfection Among HIV-infected Individuals in Two Regional Hospitals in Cameroon. *The Open AIDS Journal*, 10(1), 199–208. https://doi.org/10.2174/1874613601610010199

[25]. Matthews, P. C., Geretti, A. M., Goulder, P. J. R., & Klenerman, P., 2014, Epidemiology and impact of HIV coinfection with Hepatitis B and Hepatitis C viruses in Sub-Saharan Africa. *Journal of Clinical Virology*, 61(1), 20–33. https://doi.org/10.1016/j.jcv.2014.05.018

[26]. Molu, J. P., Essome, M. C. N., Monamele, C. G., & Njouom, R., 2018, Sero-prevalence of HBsAg in naive HIV-infected patients in a rural locality of Cameroon. *BMC research notes*, 11(1), 39. https://doi.org/10.1186/s13104-018-3159-2

[27]. Dharel, N., & Sterling, R. K., 2014. Hepatitis B virus-HIV coinfection: Forgotten but not gone. *Gastroenterology and Hepatology*, 10(12), 780–788.

[28]. Diwe, C. K., Okwara, E. C., Enwere, O. O., Azike, J. E., Nwaimo, N. C., 2013, Sero-prevalence of hepatitis B virus and hepatitis C virus among HIV patients in a suburban University Teaching Hospital in South-East Nigeria. *Pan Afr Med J*, 10;16:7. https://doi.org/10.11604/pamj.2013.16.7.3077

[29]. Akindigh, T. M., Joseph, A. O., Robert, C. O., Okojokwu, O. J., Okechalu, J. N., & Anejo-Okopi, J. A., 2019, Seroprevalence of hepatitis B virus coinfection among HIV-1-positive patients in North-Central Nigeria: The urgent need for surveillance. *African Journal of Laboratory Medicine*, 8(1), 2–5. https://doi.org/10.4102/ajlm.v8i1.622

[30]. Rana, U., Driedger, M., Sereda, P., Pan, S., Ding, E., Wong, A., Walmsley, S., et al., 2019, Characteristics and outcomes of antiretroviral-treated HIV-HBV co-infected patients in Canada? *BMC Infectious Diseases*, 19(1), 1–10. https://doi.org/10.1186/s12879-019-4617-8

[31]. Sarmati, L., & Malagnino, V., 2019, HBV infection in HIV-driven immune suppression. *Viruses*, 11(11). https://doi.org/10.3390/v11111077

[32]. Baseke, J., Musenero, M., & Mayanja-Kizza, H., 2015, Prevalence of hepatitis B and C and relationship to liver damage in HIV infected patients attending Joint Clinical Research Centre Clinic (JCRC), Kampala, Uganda. *African health sciences*, 15(2), 322–327. https://doi.org/10.4314/ahs.v15i2.3

[33]. Kim, Y., Kim, S. W., Kwon, K. T., Chang, H. H., Jun, Y., Sohn, J. W., Park, D. W., et al., 2020. Significance of Decreasing Rate of HIV and HBV Coinfection in a Nationwide Korean HIV/AIDS Cohort. Journal of Korean Medical Science, 35(3), e7. https://doi.org/10.3346/jkms.2020.35.e7

[34]. Jiang, X., Chang, L., Yan, Y., & Wang, L., 2021, Paradoxical HBsAg and anti-HBs coexistence among Chronic HBV Infections: Causes and Consequences. *International journal of biological sciences*, 17(4), 1125–1137. https://doi.org/10.7150/ijbs.55724

[35]. Freitas, S. Z., Soares, C. C., Tanaka, T. S. O., Lindenberg, A. S. C., Teles, S. A., Torres, M. S., et al., 2014, prevalence, risk factors and genotypes of hepatitis B infection among HIV-infected patients in the State of MS, Central Brazil. *Brazilian Journal of Infectious Diseases*, 18(5), 473–480. https://doi.org/10.1016/j.bjid.2014.01.005

[36]. Malagnino, V., Cerva, C., Maffongelli, G., Teti, E., Foroghi Biland, L., Cesta, N., De Masi, M., et al., 2019, HBcAb seropositivity is correlated with poor HIV viremia control in an Italian cohort of HIV/HBV-coinfected patients on first-line therapy. Scientific reports, 9(1), 11942. https://doi.org/10.1038/s41598-019-46976-1

[37]. Chen, P., Xie, Q., Lu, X., Yu, C., Xu, K., Ruan, B., Cao, H., Gao, H., & Li, L., 2017, Serum HBeAg and HBV DNA levels are not always proportional, and only high levels of HBeAg most likely correlate with high levels of HBV DNA: A community-based study. *Medicine*, 96(33), e7766. https://doi.org/10.1097/MD.0000000000007766

[38]. Abulude, O. A., Ahmed, I., & Sadisu, F. U., 2017, Assessment of Hepatitis B Viral Infection as a Predictor of Hepatic Enzymes and Compounds Alteration among Antenatal Patients. *Medical sciences (Basel, Switzerland)*, 5(4), 24. https://doi.org/10.3390/medsci5040024

[39]. Alexopoulou, A., & Karayiannis, P., 2014, HBeAg negative variants and their role in the natural history of chronic hepatitis B virus infection. *World Journal of Gastroenterology*, 20(24), 7644–7652. https://doi:10.3748/wjg.v20.i24.7644

[40]. Kye-Duodu, G., Nortey, P., Malm, K., Nyarko, K. M., Sackey, S. O., Ofori, S., & Afari, E. A., 2016, Prevalence of hepatitis B virus coinfection among HIV-seropositive persons attending antiretroviral clinics in the Eastern Region of Ghana. *The Pan African Medical Journal*, 25(1), 7. https://doi.org/10.11604/pamj.supp.2016.25.1.6172

[41]. Ikeda, D., Sugawa, M., & Kawahara, K., 2016, Study on Evaluation of Alanine Aminotransferase (ALT) as Surrogate Marker in Hepatitis Virus Test. *Journal of medical and dental sciences*, 63(2-3), 45–52. https://doi.org/10.11480/jmds.630302

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Investigate the Factors Contributing to Gender Inequality in Literacy: The Shortfall in boys' Literacy Development in Primary Schools in the Parish of St. James, Jamaica

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Abstract

This article explores the factors contributing to gender inequality in literacy development among boys in St. James, Jamaica, and the disparities between them and their female counterparts. Using a mixed-method approach, the study gathered qualitative and quantitative data to examine the underlying causes of boys' underachievement in literacy. The research identified a range of influencing factors, which includes school environment, home support, family background, teaching strategies, and teacher-student relationships. Ethical standards were observed, and the study also addressed its limitations and anticipated outcomes. Findings revealed that gender inequality in literacy remains a persistent concern, both locally and globally. Boys in St. James are particularly disadvantaged due to cultural expectations, limited parental involvement especially from fathers, and classroom practices that often fail to align with their learning preferences. Many boys are expected to adopt adult responsibilities prematurely, such as becoming breadwinners, which hinders their educational progress. Additionally, societal norms surrounding masculinity discourage boys from engaging in reading and writing, which are often perceived as feminine activities. This study concludes that boys face unique challenges that significantly impact their literacy development. These include a lack of male role models in education, limited access to culturally relevant reading materials, and instructional methods that do not accommodate diverse learning styles. The cumulative effect of these challenges results in boys being underserved by the current educational system. Addressing these issues requires targeted policy reform, teacher training, and greater parental and community involvement to foster equitable literacy outcomes for all students.

Keywords*: Disparity, Gender Inequality, Literacy, Literacy Development, Shortfall, Teacher-Student Relations, Teaching and Learning Strategies.*

Introduction

The purpose of this research is to determine the factors which influence the inequality in literacy development among boys who have been lagging behind their female counterparts for decades. Gender inequality in literacy development is a persistent global challenge, manifesting in various educational contexts and disproportionately affecting different gender groups (e.g. shifting from focusing on girls' access to focusing on boys' attainment) [1, 2, 9]. Addressing this issue requires a comprehensive understanding of the contributing factors that underpin gender disparities in literacy development in boys in the parish of St. James. These factors may include but are not limited to socio-economic conditions, cultural customs and norms, availability of educational resources, teaching practices, family dynamics among other factors. Upon investigating these factors, the researcher can identify interventions and

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employ strategies to mitigate disparities and promote equitable literacy development for all students, both boys and girls. The research also aims to explore the multifaceted reasons behind this literacy gap among boys by examining local educational practices, socio-cultural influences, and policy implications (including how national policies may marginalize boys) [10]. Regarding policy implementations, the researcher determines its effectiveness to mitigate this gap that prevents equity.

Framework

To investigate the factors contributing to gender inequality in literacy development among boys in primary schools in the parish of St. James, Jamaica, the following theoretical frameworks were employed. According to [11], the term "concept" does not stand alone, but is related to other concepts and forms meaning. Hence the conceptual connection with other concepts creates a "framework" of related or interlinked concepts. Framework is the conceptual line through which concepts connect and make meaning. They further opined that the conceptual framework of study is a system of concepts, assumptions, expectations, beliefs, and theories that supports and informs your research.

According to [12], the theoretical framework is defined as empirical or quasi-empirical theory of social and/or psychological processes, at a variety of levels that can be applied to the understanding of phenomena within the context of research. They further asserted that a theoretical framework provides researcher guidance for the study questions, methods for measuring variables are selected and analyses are planned. The overall framework draws also on gender and literacy theory (e.g. how gendered norms shape literacy identities) [13].

Review of Literature

The literature review aims to delve into the numerous factors that directly impact literacy development, ultimately leading to disparities in literacy achievement among boys in primary schools in St. James, Jamaica. According to [13], basic literacy is the ability to identify, understand, interpret, create, and communicate. It is well documented that girls and boys learn differently (e.g. in reading fluency, comprehension strategies, writing approaches), and therefore they both require differentiated teaching and learning strategies for them to assimilate what is being taught [14, 15]. Tapping into every facet of how boys learn—such as kinetic, visual, social methods—is of paramount importance. This will place them at a better advantage to be on par with their female counterparts as it relates to their literacy development and overall academic achievements.

Some Causes of Gender Inequality

The school environment is one factor that may adversely affect boys' literacy development. The teaching and learning strategies employed whilst teaching boys as opposed to girls can disadvantage boys if they rely heavily on passive listening, textual reading, or low engagement tasks [16, 17]. It is apparent that boys often prefer more interactive, competitive or movement-based approaches, and so the teaching and learning approach for boys should be tailored to cater to their individual learning styles. This could be done on a one-on-one basis, or a whole class differentiated approach. Teachers could employ the use of games, peer reading, role plays, and fun activities that will pique boys' interest and channel them into the path of learning (e.g. literate play, gamified reading) [18]. According to [2], gender differences that have a negative impact on educational achievement are best addressed at a whole school level and as a part of the institution's general ethos. Their overall focus considers behaviour, equal opportunities, fostering pride, effort and achievement, pupil involvement in the life of the school, and values and aims. This holistic approach, when carried out

comprehensively with the inclusion of all stakeholders, is more likely to narrow the gender inequality gap and improve boys' academic and literacy performance.

In Jamaican settings specifically, school practices and disciplinary styles sometimes degrade boys' self-esteem or reinforce non-academic identities (e.g. labeling, harsh punishments) [4, 10]. Moreover, school-related gender violence or bullying around reading skills may further alienate boys from literacy engagement [19].

Home Environment and Gender Inequality

The home environment also plays a vital role in closing gender inequality for boys. Boys are at a disadvantage when compared to their female counterparts in many settings. Gender discrimination often begins at home. This happens when parents assign specific chores to girls as opposed to boys, thus reinforcing gendered divisions of labor [20]. Parents/Guardians often task boys with fewer chores requiring critical thinking, and more "outside" tasks (e.g. errands), whereas girls are assigned more household responsibilities (e.g. cleaning, cooking), reducing study time. If boys are allowed to carry out some of the chores often deemed "for girls," this would help them develop skills that enable critical thinking and planning. Research also shows that parental modeling (e.g. mother/father reading at home) influences children's literacy behaviors differently by gender [13, 21].

Research has further shown that boys who grew up without their fathers suffer academically more than girls in similar situations. According to [5], children in single mother families often show lower academic achievement than counterparts in two-parent households; similarly, [7] posits that the effect of father absence is more severe for boys during primary school age. [8] suggests that family structure including father involvement in daily child activity could enhance children's academic performance. Fathers who play a significant role in the life of their children, especially boys, contribute positively to their discipline, self-regulation and motivation, which can in turn support literacy development.

Boys are also disadvantaged because of societal stigma affecting masculinity. Boys may shy away from reading because they believe that it is a "girly" practice, internalizing negative stereotypes about masculinity and academic engagement [5, 6]. For example, in Jamaican classrooms, boys often avoid reading aloud or engaging in writing tasks for fear of being teased or labeled "soft" [5]. Boys' reading levels could improve if more focus was placed on addressing these stereotypes and encouraging male reading culture in homes and schools.

On the other hand, [10] observed that in many industrialized countries, women now obtain considerably more education than men, prompting researchers and policymakers to explore why boys lag behind in educational outcomes [2, 10, 11, 13]. The assignment of household chores along gender lines is a primary mechanism by which gender inequality is reproduced in the home [20]. Empirical studies show that girls disproportionately bear unpaid domestic labor (cleaning, caregiving, chores), reducing their time for study, while boys often have more leisure or play time [14, 20]. One study in informal settlements reported that boys spend about 10 % fewer hours per week than girls on educational activities (school + homework) but far more time on outdoor play; girls spend more hours in domestic duties, constraining their learning time [14].

Regarding father absence, some studies show that boys in father-absent households are more likely to be suspended, drop out, or underperform academically compared to girls in similar family structures [10]. Moreover, [1] found that in two-parent households, some home environmental advantages favor boys,

but such advantages disappear in single-mother contexts, contributing to the performance gap.

Societal stigma around gendered behavior further compounds these patterns: gender norms often discourage boys from participating in activities seen as feminine (reading, arts, domestic tasks) and reinforce traditional male spheres (sports, physical play) [13, 20]. While no single study exactly claims, "boys avoid reading because it is girly," many studies demonstrate that parental role modeling and division of labor shape children's gender attitudes from early ages, with more egalitarian sharing of chores associated with more egalitarian attitudes in children [12, 13, 20].

Gender Inequality That Affects Girls

While this study focuses on boys, it is important to note that gender inequality also affects girls. The article "Gender Discrimination Causes Inequality" defines gender discrimination as differences in rights, opportunities or treatment based solely on sex or gender. Such discrimination creates barriers for girls, boys, women, and men in various spheres including education. In many places, girls outperform boys academically, and this finding has been widely documented (e.g. girls consistently outmastering boys in literacy and numeracy in Jamaica) [10]. Such reversal of traditional gender gaps has drawn scholarly attention to the lagging performance of boys rather than girls [2, 10, 11].

Teacher-Student Relationship

Teacher–student relationships are pivotal within the learning environment. Boys may benefit more from positive relationships with teachers, particularly males, who may serve as role models and mitigate disengagement [7, 22]. Research suggests that boys often prefer male teachers who "understand" them and can relate to their interests [22]. According to [2], in the largely female teaching workforce, the presence of more male teachers might support boys' achievement. On the other hand, some studies found that female teachers tend to hold more positive expectations and form stronger relationships with all students, which can benefit boys [5, 6]. For example, [6] argued that female teachers often demonstrate higher relational warmth and support, which can offset the lack of male teachers. Thus, while male teachers may offer certain advantages, skilled female teachers with gender-sensitive strategies can still foster strong relationships with boys.

Teaching and Learning and Gender Inequality

Because boys and girls often have differing learning preferences, teachers must be creative and intentional when designing lessons for boys. Traditional, static pedagogy may disadvantage boys who respond better to active, hands-on, and socially interactive approaches (e.g. cooperative learning, drama, project work) [14, 17]. According to [7], children may suffer if instructional activities are not intentionally equity-oriented and responsive to diverse learner needs. Teachers should therefore design lessons tailored to boys' interests (e.g. thematic texts on sports, action, science) and varied modalities (visual, auditory, tactile) to engage them. Similarly, scaffolding, differentiated tasks, and formative assessment help ensure that boys are not left behind by one-size-fits-all instruction [14].

Gaps That May Exist

Students in primary schools in the parish of St. James are expected to be prepared by their teachers to pass the Grade 4 Literacy Test. The test results are categorized as 'Mastery,' 'Non-Mastery,' or 'Near Mastery.' Students begin preparation from Grade 3, with intensified literacy instruction in Grade 4. However, despite these efforts, many boys who sit the examinations still fail to attain 'Mastery' and are placed in 'Near Mastery' or 'Non-Mastery.' According to [8], performance statistics indicate a greater degree of

underachievement among boys. Quello and Carlson (in Rose II) stated:

"Poor reading abilities are concentrated among boys. By the time students reach grade 6, 30 % of students read below their grade level. By grade 9 a huge divide has occurred – large numbers of students, especially boys, cannot read or write, while some are functionally illiterate. Because of their reading deficiency, they cannot learn the content of various subjects." (p. 95)

Thus, it is evident that boys have trailed girls in reading performance for a long period.

In Jamaica more broadly, national assessment results repeatedly show girls outperforming boys in literacy and numeracy exams [10]. For instance, in recent literacy and numeracy tests, girls have consistently achieved higher mastery levels than boys [10].

Research Questions

Main Research Question:

What are the primary factors contributing to the shortfall in boys' literacy development in primary schools in the parish of St. James, Jamaica?

Sub-Questions:

1. What are the key factors contributing to boys' lower literacy rates in primary schools in St. James, Jamaica?
2. How do teachers, parents, students, and other key stakeholders perceive the literacy gap between boys and girls?
3. What types of interventions have been implemented, and what are their impacts on boys' literacy development?

Methodology

This study employs a mixed-methods research design (MMR), which integrates both quantitative and qualitative approaches within a single study to provide a more nuanced and robust understanding than either method alone [12, 16]. Mixed methods are considered ideal in educational research when exploring complex, context-sensitive issues like literacy and gender [2, 16]. For example, in gender and ICT research, the mixed methods approach revealed that qualitative data could surface cultural inequities not evident in quantitative results [16]. In literacy interventions, mixed-method designs enable both measurement of impact and understanding of implementation processes [14]. The integration of quantitative and qualitative strands enhances validity through triangulation and complementary insights.

Qualitative Method

Qualitative research methods are deployed to access the experiences, perceptions, and contextual meaning of participants, especially where the phenomenon is socially embedded [12, 16]. In this study, qualitative techniques such as semi-structured interviews, focus groups, and classroom observations will be used to explore stakeholder perspectives (teachers, students, parents, administrators).

1. **Semi-structured interviews** will guide conversations around literacy attitudes, gender norms, home reading practices, and constraints (e.g. "How do you view boys' reading habits at home?"). The flexibility enables follow-up probing of unexpected themes.
2. **Focus groups** (e.g. with parents or classes of boys) allow dynamics of shared belief systems, peer influence, and community norms to surface.
3. **Classroom observations** permit direct, real-time insights into instructional interactions, student engagement, teacher behavior, and how boys respond to literacy tasks.

Data will be audio recorded (with consent), transcribed, and coded thematically (open, axial, selective coding). A hybrid coding approach may be used — combining inductive and deductive coding to capture emergent themes and test theoretical constructs (e.g. masculinity norms). Themes will be compared

across schools and stakeholder groups. In some cases, process tracing may be applied within selected school cases to map how specific contextual factors lead to observed literacy outcomes over time [16]. The sample is purposive and stratified to include variation (e.g. schools high/low performing, rural/urban), and sampling continues until thematic saturation.

The qualitative strand is expected to illuminate why certain statistical relationships occur, uncover barriers to reading engagement, and reveal cultural and emotional layers of boys' literacy that numbers cannot show.

Quantitative Method

Quantitative research in this study will test hypothesized relationships among variables and determine the magnitude and significance of predictors of boys' literacy outcomes [10, 12]. The quantitative strand will draw on standardized test scores, attendance records, socio-economic data, and survey instruments for attitudes and home literacy behaviors.

The Steps Include:

1. **Instrument design** — Develop structured surveys (e.g. Likert scales) for students, parents, and teachers to capture variables such as frequency of home reading, parental support, access to books, and attitudes toward reading (e.g. self-efficacy, reading enjoyment). The item selection will be informed by themes from qualitative interviews and prior literature (e.g. validated scales in literacy research).
2. **Sampling and data collection** — A representative sample of Grade 3–4 students and associated parents across multiple primary schools in St. James (stratified by performance and region). Surveys and data collection will be administered, with efforts to ensure high response rate and minimize missing data.
3. **Data cleaning and screening** — Check for missing values, outliers, normality, multicollinearity, and reliability of scales (e.g. Cronbach's alpha).
4. **Descriptive statistics** — Compute frequencies, means standard deviations for key variables, disaggregated by gender, school, socio-economic strata.
5. **Inferential statistics** — Use t-tests or ANOVA to compare male and female groups on literacy outcomes. Employ regression analyses (e.g. multiple linear regression) to test how independent variables (e.g. parental involvement, reading frequency, attendance) predict boys' literacy outcomes. Where outcome is categorical (e.g. 'Mastery' vs 'Non-Mastery'), logistic regression may be used. If multiple latent constructs (e.g. "home reading environment"), Structural Equation Modeling (SEM) may be applied to test path relationships. Interaction effects (e.g. reading frequency × parental support) may be tested.
6. **Longitudinal or trend analysis (if available)** — Compare historical literacy performance data for boys across cohorts or years to detect changes over time and trends.
7. **Effect size and power analysis** — Report effect sizes (e.g. Cohen's d, R^2) to illustrate practical significance beyond statistical significance.

Quantitative results yield generalizable patterns, enable hypothesis testing, and allow estimation of how much variance in literacy scores is explained by predictor variables.

Integration of Quantitative and Qualitative Strands

In keeping with best practices in mixed methods research, this study will integrate data at multiple stages: design (qualitative findings inform survey items), analysis (e.g. qualitizing quantitative findings or quantitizing coded themes), and interpretation (merging results to

build a coherent model) [16]. For instance, if regression shows parental involvement strongly predicts literacy, qualitative interviews might reveal how parents conceptualize "involvement," barriers they face, and strategies they use. In turn, qualitative insights about teacher practices might suggest interaction terms to include in regression models.

To ensure methodological rigor, criteria such as transparency, degree of mixing, interpretive comprehensiveness, and validity (e.g. triangulation, member checking) will be adhered to. Mixed methods evaluation rubric such as the MMER (Mixed Methods Evaluation Rubric) may be used to assess the quality of integration, methodological coherence, and interpretive adequacy [16].

Conclusion

This article investigates the factors contributing to gender inequality in literacy development among boys in St. James, Jamaica, and the disparities between boys and girls. Using a mixed-method approach, the research examines the school and home environments, parental support, teacher-student relationships, and teaching strategies. The study reveals that boys face multiple challenges that hinder their literacy development, including societal expectations (e.g. being breadwinners), masculinity norms, limited male role models, and instructional strategies that do not meet diverse learning styles.

The introduction emphasizes that gender inequality in literacy is a persistent global issue, with boys in St. James falling behind their female counterparts for decades. The study aims to understand the socio-economic, cultural, and educational factors driving this gap and explore policy measures to address it.

The literature review explores causes of inequality, such as differences in how boys and girls learn, the impact of school environment, home dynamics, and the influence of absent father figures. Boys are often disadvantaged by societal stigmas and masculinity norms, which discourage reading and critical thinking. Teacher-student relationships and the gender of teachers are also influential factors.

The study uses a mixed-method approach, combining qualitative data (interviews, observations) and quantitative data (test scores, attendance, survey responses) to gain a comprehensive understanding of the phenomenon. Ethical considerations are maintained, and the study explores possible interventions and strategies to mitigate these disparities and promote gender equality in literacy development.

Conflict of Interest

The researcher declares that there are no known conflicts of interest associated with this study. This research was conducted with impartiality and objectivity, without any financial, personal, or professional affiliations that could have influenced the results or interpretations presented. Any potential bias has been acknowledged and mitigated through strict ethical guidelines, transparent methodology, and the use of multiple data sources to ensure validity and reliability.

The findings of this study reveal that gender inequality in literacy development among boys in primary schools in St. James, Jamaica, is influenced by multiple interrelated factors. Quantitative data analysis indicated that boys consistently underperform in literacy assessments compared to girls, particularly in reading comprehension and writing. Statistical results showed that 62 % of boys achieved "Near Mastery" or "Non-Mastery" on the Grade 4 Literacy Test, compared to 38 % of girls.

Qualitative data from teacher interviews and parent focus groups supported these results, highlighting that boys generally show lower levels of engagement in reading activities both at home and in the classroom. Teachers noted that boys often exhibit less motivation toward reading tasks and respond better to interactive

and game-based learning approaches. Additionally, parents cited traditional gender norms as a major influence — boys were encouraged to play outdoors while girls were more often required to complete household chores or read quietly indoors.

The absence of a father or positive male role model was also found to significantly affect boys' literacy development. Boys from single-mother households exhibited lower academic performance and self-regulation in comparison to those from two-parent families. This finding aligns with the work of [7] and [1], which indicate that boys without fathers are more likely to face academic and behavioral difficulties.

Discussion

The results confirm that gender inequality in literacy development is deeply rooted in both home and school environments, reflecting a complex interplay of socio-cultural, psychological, and institutional factors.

The home environment contributes significantly to this gap. As suggested by [14] and [20], gender division of chores limits girls' study time while simultaneously reinforcing stereotypes that discourage boys from engaging in literacy activities viewed as feminine. In the Jamaican context, these findings reflect persistent patriarchal norms where reading and quiet academic pursuits may be stigmatized in boys' peer groups.

At the school level, the predominance of female teachers and limited male role models further contribute to boys' lower literacy engagement. Although female teachers often offer nurturing support, male teachers can provide relatable role models that motivate boys and shape their classroom behavior [22, 11].

Moreover, the absence of fathers or male figures in households common in many Jamaican communities exacerbates the literacy divide. The findings support the conclusion that father involvement positively affects boys' emotional stability, discipline, self-esteem, and academic performance [7, 1].

Finally, societal expectations of masculinity discourage boys from reading and engaging in "non-masculine" academic tasks, which negatively impacts literacy achievement. To address this, interventions must challenge gender stereotypes, promote differentiated learning strategies, and engage fathers and male mentors as active participants in literacy programs.

Ethical Approval

This study was conducted in accordance with the ethical standards of the University Research Ethics Committee and the Ministry of Education and Youth, Jamaica. Approval was obtained before data collection. All participants were informed of the purpose of the study and their rights as participants. Informed consent was obtained from adult participants, and parental consent was obtained for participating students. Confidentiality and anonymity were strictly maintained, and data were securely stored in password-protected digital files.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request. To protect privacy and abide by ethical guidelines, identifiable or sensitive information will not be publicly shared. Aggregated data summaries and anonymized transcripts may be made available subject to ethics committee approval.

Author's Contributions

The author (J. Shaw-Williams) conceptualized the study, designed the research framework, collected and analyzed both quantitative and qualitative data, and prepared the manuscript. The author also conducted all interviews, transcribed qualitative data, and performed the literature review. All aspects of the research process from design to writing were completed independently, with supervisory guidance and peer feedback.

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References

[1]. Dialnet, 2025, Promoting gender equality in the classroom. *Teacher_sChool*, 8953813(2). from: https://dialnet.unirioja.es

[2]. DiPrete, T. A., & Buchmann, C., 2013, *The rise of women: The growing gender gap in education and what it means for American schools.* New York: Russell Sage Foundation.

[3]. Cano, G., Hofmeister, H., et al., 2023, Role of parental attitudes and behaviour in the development of adolescents' gender housework stereotypes. *European Sociological Review*, 39(2), 112–130.

[4]. Ermisch, J. F., & Francesconi, M., 2001, Family structure and children's achievements. *Journal of Population Economics*, 14(2), 249–270.

[5]. Fomby, P., & Cherlin, A. J., 2007, Family instability and child wellbeing. *American Sociological Review*, 72(2), 181–204.

[6]. Sigle-Rushton, W., & McLanahan, S., 2002, Father absence and child well- being: A critical review. *Center for Research on Child Wellbeing Working Paper Series.*

[7]. Glock, S., & Kleen, H., 2017, Gender and student misbehavior: Evidence from implicit and explicit measures. *Teaching and Teacher Education*, 67(1), 93–103.

[8]. Lundberg, S., 2017, Father absence and the educational gender gap. *Institute for Labor Economics (IZA) Discussion Paper Series.*

[9]. Mott, F. L., 1994, Sons, daughters and fathers' absence: Differentials in father leaving probabilities and in home environments. *Journal of Marriage and Family*, 56(3), 531–541.

[10]. Warrington, M., Younger, M., & Bearne, E., 2006, *Raising boys' achievement in primary schools: Towards a holistic approach.* London: Department for Education and Skills.

[11]. Spilt, J. L., Koomen, H. M. Y., & Jak, S., 2012, Are boys better off with male and girls with female teachers? A multilevel investigation of measurement invariance and gender match in teacher–student relationship quality. *Journal of School Psychology*, 50(3), 363–378.

[12]. Watson, P. W. S. J., Rubie-Davies, C. M., Meissel, K., Peterson, E. R., Flint, A., Garrett, L., & McDonald, L., 2019, Teacher gender and expectations of reading achievement in New Zealand elementary school students: Essentially a barrier? *Gender and Education*, 31(8), 1000–1019.

[13]. OECD, 2015, *The ABC of gender equality in education: Aptitude, behavior and confidence.* Paris: OECD Publishing. DOI: https://doi.org/10.1787/9789264229945-en

[14]. O'Reilly, A., 2021, Gender inequalities in time spent doing housework by children in Ireland: A nationally representative sample across two time points. *Infant and Child Development*, 30(5), e2237. DOI: https://doi.org/10.1002/icd.2237

[15]. Review of Economics of the Household, 2025, The gender gap in children's educational time investments in informal settlements. *SpringerLink.* DOI: https://doi.org/10.1007/s11150-025-09785

[16]. Quello, J., & Carlson, B., 2020, *Social assessment of Rose II* (p. 95 quoted). *University Research Press.*

[17]. Van Hek, M., Kraaykamp, G., & Wolbers, M. H., 2016, Comparing the gender gap in educational

attainment: The impact of emancipatory contexts in 33 cohorts across 33 countries. *Educational Research and Evaluation*, 22(5–6), 260–282.

[18]. Sigle-Rushton, W., 2008, Father absence and child well-being: Additional empirical evidence. *Journal of Family Studies*, 14(3), 215–230.

[19]. Brookings Institute, 2018, Gender-based violence in primary schools: Jamaican context. *Brookings Policy Paper.* Retrieved from: https://www.brookings.edu

[20]. Clarke, R., 2007, Ethnographic study of gender beliefs in Jamaican boys, teachers, and parents: Gender identity and academic self-perception. *Caribbean Educational Review*, 9(1), 45–63.

[21]. Indah, N., 2024, Effectiveness of a mixed-methods-based literacy program in improving reading comprehension, vocabulary mastery, and reading fluency skills of early grade students. *International Journal of Learning, Teaching and Educational Research*, 23(2), 89–105.

[22]. Sechrest, L., & Sidani, S., 1995, Quantitative and qualitative methods: Is there an alternative? *Evaluation and Program Planning*, 18(1), 77–87.



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