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Assessment of the Capacity of Patent and Proprietary Medicine Vendors to Provide Contraceptive Services to Adolescents in Kaduna State, Nigeria

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Abstract

The contraceptive Prevalence Rate among adolescents has remained extremely low in Kaduna State due to limited access to health facilities with youth-friendly services. Patent and Proprietary Medicine Vendors (PPMV) are the most widespread health facilities and the first point of access for family planning commodities in Nigeria. Providing contraceptive services to adolescents requires specific sets of skills and an environment that are youth friendly. This study examines the capacity of PPMV to offer contraceptive services to adolescents. The study used a cross-sectional descriptive design. We interviewed 462 PPMV selected from urban and sub-urban Local Government Areas (LGA) of Kaduna State using a multistage random sampling technique. Data analysis was based on percentages conducted with SPSS software, version 20. Findings from the assessment show that PPMV are a mix of professionals and lay providers. 43.1% possess a qualification in Nursing, midwifery, or community health, and 18.8% have received specific training on contraceptive services. 91.6% are dispensing contraceptives that are suitable for adolescents, and 97.4% are willing to acquire additional training to provide adolescent-friendly contraceptive services for both the married and unmarried. The study equally shows that most PPMVs have private space (70.1%) for confidential counselling and operate seven days a week (86.6%) and twelve or more hours a day (83.3%). Pharmacists Council of Nigeria should consider expanding the scope of contraceptive services that PPMV can provide based on their training.

Keywords: *Adolescents, Contraceptive, Drug Stores, Family planning, PPMV, Youth-friendly services.*

Introduction

Nigeria is the 10th most populous country in the world and number one in Africa. Its health indices are poor; persistently low contraceptive prevalence rate, especially among adolescents [1, 2], maternal and infant mortality at 814 per 100,000 and 65 per 1000 live birth, respectively [3, 4], and fertility rate of 5.6 [5].

Adolescents engage in sexual activities and are often at risk of unwanted pregnancy, unsafe abortion, and HIV and AIDS [6, 7]. Nigeria has a high rate of unintended pregnancy linked to early marriage, poor access to health information and services, sexual exploitation, and abuse, among others [8]. Consequently, many adolescents have resorted to abortion, which in many instances are unsafe. Adolescents in and out of school consider teenage/unwanted pregnancy and abortion as major health challenges that they are confronted with and for which many visit health facilities or youth-friendly centres for information and services [6].

Adolescents encounter both supply and demand-related barriers to using health facilities. For example, on the demand side, adolescents are shy, afraid, lack the ability to pay, and have limited awareness and knowledge of services and service delivery points. The supply-side issues include lack of privacy and confidentiality, distant location of health facility,

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poor attitude, and competency of providers [5]. Addressing these barriers would require application at service delivery points the essential components of youth-friendly services that include confidentiality, respectful treatment, integrated services, culturally appropriate care, easy access to care, free or low-cost services, reproductive and sexual health care, services for young men, and promoting parent-child communication [9].

The private sector is an important source of reproductive health services in poorer nations. It accounts for about 38% of access in sub-Saharan Africa, but its contribution may be much higher in some individual countries [10]. Patent and Proprietary Medicine Vendors (PPMV), otherwise referred to as drug shops or chemists, is an important component of the private health sector it offers family planning drugs and services across several developing countries and in most cases, are making an impact on the healthcare delivery system. They are often the first and, in most cases, the only point of primary healthcare services in poor nations [11]. Countries such as Nigeria, Tanzania, Uganda, Ghana, Nepal, Kenya, and a host of others have thriving family planning services among PPMV even though the relevant laws in these countries allow for sales of only limited forms of contraceptives [12-14]. In Nigeria, PPMV account for 72% of private facilities stocking contraceptives or offering FP services [15], and it is estimated that over 60% of women who use contraceptives have received it from a PPMV [16]. [16] summarized the evidence in the literature on the reasons why clients prefer obtaining family planning methods from PPMV, including the absence of formalities and time-wasting at PPMV prior to being attended, the proximity of the facility to their homes, and the perception that clients will pay more at a health facility [17].

PPMV in Nigeria is regulated by the Pharmacists Council of Nigeria (PCN) based on the provision of Act 91 of 1992 (now Act CAP 17 LFN 2004). The Law allows PPMV to offer over the counter (OTC) drugs and excludes them from dispensing prescriptive drugs. Therefore, PPMV are restricted by regulation to provide barrier methods. Nevertheless, studies have shown that in practice, PPMV offers Oral contraceptive pills, including emergency pills, and injectable contraceptives in contravention of the provision of relevant laws [13, 14, 18]. A study observed that about 70% of PPMV are likely not to refer new clients, while only 50% would refer women with complications [19]. These inappropriate practices by the PPMV are exacerbated by the limited number and spread of Pharmacies and hospitals offering contraceptive services, the unfriendly attitude of providers in hospitals, frequent stock-out of contraceptives, profitability of contraceptive services, and increasing number of trained healthcare providers as PPMV [10, 12, 19].

Inadequate human resources arising from poor funding is a major predisposing factor to the sorry state of healthcare in the country. Nigeria has a shortfall of practicing medical doctors and Pharmacists serving its population of over 200 million people. It is estimated that doctor to patient ratio is 1/6000 in Nigeria, and Pharmacist to patient ratio of 1/15,152 against the WHO standard of 1/600 and 1/1000, respectively [20, 21]. The gap in professional practice has encouraged the widespread involvement of a lower cadre of health professionals and non-health trained practitioners in the delivery of healthcare services, including family planning. There are over 200,000 PPMV providing some form of healthcare in Nigeria [22]. PPMV is widely spread in urban and rural areas of the country and offers services to all categories of the population, including adolescents. PPMV are a major providers of family planning services and are more likely to experience fewer stockouts compared to Pharmacies or hospitals [19]. They exploit their competitive advantage; proximity, shorter waiting time, flexibility in-service hours, and skill in providing short-term methods like condoms, pills, and injectables to attract clients

away from public facilities [12]. The potential for PPMV to be the contraceptive service point of choice for adolescents is reinforced by the ability of the providers to demonstrate technical competence and the ability to communicate effectively and be sensitive to the cultural matter regarding adolescents [15, 16, 18, 23, 25]. This is further enhanced by flexible operating hours, including weekends, the use of accessible technology, create linkage to nearby facilities that can remove for adolescents the barriers to access such as long-distance from service delivery points, visiting hours, and follow-up issues [16, 25, 26]. In addition, providing free or low-cost services meet the need of many adolescents who are dependent and have limited income to have access to reproductive and other essential health services. Nevertheless, some studies have observed a gap in the quality of services provided by PPMVs. For instance, [19] observed that either due to technical competence, experience, or confidence, PPMVs do not routinely interrogate women on sensitive reproductive health issues or contraindication and may likely miss providing information on how to use pills or what should be done if a dose or more is missed. Equally, PPMVs do not often promote the contraceptive services that they offer, therefore, opportunities for the client to access information, education, and communication materials at PPMVs are limited [17, 23].

Given the peculiarities of adolescents resulting from their physical and emotional state, it is imperative to assess the PPMV for their capacity to offer quality family planning services that meet their needs. Most studies have examined the demand side, but where the supply side is studied, not many have appraised the physical space and educational background, and contraceptive training of the providers. The outcome of this study will further expose the capacity existing within PPMV to offer quality contraceptive services beyond the current scope of practice and form part of the evidence that may necessitate the expansion of the contraceptive method mix offered by PPMV in Nigeria. Consequently, this study examines the capacity of PPMV to offer contraceptive services to adolescents with consideration of the physical environment, contraceptive method mix, and educational background/training of the PPMV.

This study assessed the potential capacity of PPMVs to offer contraceptive services to adolescents and only considered the supply side of the service. It may be possible that potential capacity may not necessarily translate to competence in the actual delivery of contraceptive services. The analysis is based on descriptive statistics and is limited to frequency and simple percentages. This limits the potency of the conclusion as there was no test of the hypothesis. However, the sampling technique and sample size ensured the collection of representative data for the study.

Materials and Methods

This section reviews the settings, study design, target population, sampling and sampling technique, research instrument, data collection, ethical considerations, and data analysis.

Research Design

The study design used for this research is the cross-sectional descriptive design. This study design was used because I wanted to understand the current situation on the delivery of family planning services by the Patent and Proprietary Medicine Vendors in Kaduna State to inform possible policy changes that may enhance the quality of service provided to adolescents.

Setting

This study was conducted in six local government areas (LGAs) of Kaduna state. Kaduna State is the third most populated state in Nigeria, with a projected population of 8.9 million based on the 2006 national population census [27]. The study targets both registered and unregistered PPMVs in the LGAs. The study population was all the PPMV dispensing drugs

within a permanent structure in the study LGAs. Determining a PPMV is based on the definition of the Pharmacists Council of Nigeria. To qualify for inclusion, the drug store must be opened on the day of visit and located at least 200 metres away from an already selected one or 400 metres away from an existing community pharmacy. Only those that fail to meet the inclusion criteria or refused to participate were excluded from the study.

Sample and Sampling Technique

The sample population of the study are PPMVs that operate retail drug stores in selected LGAs spread across urban and rural areas of Kaduna State, Nigeria.

The study used multi-criteria Decision Analysis Framework to select the study LGAs. The selected of PPMVs that were interviewed followed the inclusion criteria based on the systematic random sampling technique. All the communities within the selected LGAs were PPMVs operate were sampled. In each community, all PPMVs that were eligible based on the inclusion criteria were selected and interviewed after given verbal consent.

Data Collection

The study used a standardized National Capacity Assessment tool developed by the Federal Ministry of Health. The tool was configured on a CSPro application and downloaded on android phones. The selection of the tool is based on the nature of the study and the study objectives and research questions. The assessment tool on android phones was administered to the selected PPMVs by interviewers. Six interviewees were identified, trained, and assigned one per LGA. The Interviewers administered the questionnaire to 462 PPMVs in the study sample. The assessment tool captured information on background, infrastructure, family planning services, staff, record keeping, inventory management, and commitment to participate in training and provide family planning services.

Ethical Considerations

The participants were informed of the purpose of the assessment and were assured of the confidentiality of the data collected. Each participant gave verbal consent before administering the questionnaire. The data collected are safely stored and would not be shared with any regulatory agency without the individual consent of the study participants. Dissemination of the data is based on aggregate data without any direct link to any of the participants.

Data Analysis

Data was collected using the CSPro Application on android phones and exported to Statistical Package for Social Science (SPSS), version 20.0, on a personal laptop. The researcher used descriptive statistics to analyse the data to generate frequency tables and percentages of the different variables.

Results

This section presents the results of the four hundred and sixty-two (462) questionnaires administered; the results are presented in tabular form as shown below.

Table 1. Characteristics of Respondents

Characteristic	**Number**	**Percentage (%)**
Respondents by LGA	**(N=462)**	
Chikun	110	23.8
Igabi	110	23.8
Kachia	30	6.5
Kaduna North	45	9.7
Kaduna South	89	19.3

Sabon Gari	78	16.9
Status of PPMV Registration	**(N=462)**	
Any form of Registration	412	89.2
Registered with PCN	176	38.1
Registered with NAPPMED	357	77.3
Rate of Registration – Urban	**(N=234)**	
Any form of Registration	222	94.9
Registered with PCN	73	31.2
Registered with NAPPMED	197	84.2
Rate of Registration – Rural	**(N=218)**	
Any form of Registration	190	87.2
Registered with PCN	103	47.2
Registered with NAPPMED	160	73.4

Table 1 above indicates the background information of the study population. The distribution of the PPMVs across the selected LGAs was based on the population of PPMVs in the areas. However, distribution based on urban-rural location was almost equal, with 50.6% in urban LGAs and 49.4% in rural LGAs. Most of the PPMVs had one form of registration or the other, with a greater tendency to register with the union. Even though 89.2% said they were registered, only 38.1% registered with the Pharmacists Council of Nigeria, while 77.3% were registered with the main union, the National Association of Patent and Proprietary Medicine Dealers (NAPPMED). Moreover, PPMVs in the rural LGAs were less likely to be registered but more compliant with regulations by registering with PCN. Hence, almost half of the PPMVs in the rural LGAs are registered with PCN compared to a little less than one in three PPMVs in the urban LGAs that are registered with PCN.

Table 2. Background Knowledge of Family Planning

Qualification	**(N=462)**	
Medical Licence	199	43.1
Lower cadre Health trained	90	19.5
Non-Health trained	160	34.6
PPMV Formally Trained on FP	**(N=462)**	
Yes	87	18.8
No	375	81.2
PPMV willing to be Trained on FP	**(N=462)**	
Yes	450	97.4
No	12	2.6

Table 2 shows the background knowledge of PPMVs and their willingness to learn more about contraceptive services. PPMVs reflect a mix of professionals providing health services at the community level. As much as 43.1% of the PPMVs are trained and licensed to provide clinical services. About one in five of PPMVs in the study have some form of medical training but are not licensed to provide a wide range of services. Then there are others who do not have any background in health, and they constitute 34.6%. The data also show that despite providing a wide range of FP services, only 18.8% of the PPMVs have received formal

training and are certified to provide FP services. Nevertheless, almost all the PPMVs (97.4%) across backgrounds indicated willingness to be trained to offer FP service to young persons.

Table 3. Contraceptive Commodities Offered by PPMVs

Dispensing FP Commodity	**(N=462)**	
Any FP commodity	423	91.6
Combined oral pills	385	83.3
Emergency Pills	270	58.4
Male Condom	372	80.5
Depo Provera	252	54.5
Noristerat	288	62.3
Sayana Press	42	9.1
Non-Health Trained Dispensing FP Commodity	(N=166)	
Combined Oral Pills	147	88.6
Depo Provera	74	45
Noristerat	82	49
Sayana Press	12	7

Table 3 shows the type of contraceptives that are widely provided by PPMVs. Besides Sayana Press, more than 50% of the PPMVs provide other injectables, pills, and condoms. Interestingly, 91.6% of the PPMVs in the study dispense at least one method of family planning. Regarding the individual products, PPMVs provide Combined Oral pills (83.3%), emergency pills (58.4), the male condom (80.5), Depo Provera Injection (54.5%), and Noristerat Injection (62.3%). The study observation also shows that the non-health trained PPMVs are also providing pills and injectables that are classified as prescriptive drugs. Thus, 88.6% of the non-Health trained PPMVs to provide combined pills, 45% provide Depo provera injection, and about half of them offer noristerat injection.

Table 4. Service Delivery Space and Time

Private Space for Counselling	**(N=462)**	
Private Space available	324	70.1
Medical Licensed	166	78
Lower Cadre Health Trained	72	77
Non-Health Trained	98	59
Adequacy of private space	**(N=324)**	
Adequate	125	38.5
Partly adequate	168	51.9
Inadequate	31	9.6
Operating Time		
7 days a week	380	86.6
6 days a week	54	12.3
Less the 6 days a week	5	1.1
>=12hours a day	365	83.3
<12 hours a day	73	16.7

Table 4 indicates the nature of the space available for contraceptive services and the operating time of the PPMV. Overall, 70.1% of the service delivery points have private space for confidential counselling. The Medical Licensed PPMVs (78%) are more likely to operate an outlet with a private space compared to the lower cadre of health trained (77%) and non-Health trained (59%). Despite that majority of the stores have private space but less than have been adequate in terms of space, facilities, and cleanliness. About 39% of the private spaces are adequate for counselling and interaction with young persons. The greater proportion (51.9%) are moderately adequate, requiring housekeeping or lighting to become adequate. On the other hand, about one in ten of private spaces are inadequate in terms of size and with no possibility of expansion. The study further observed that 86.6% of the PPMVs operate daily while 12.3% work for 6 days of the week. Only about 1.1% of the PPMV are likely to operate less than six days a week. In addition, 83.3% of the PPMVs open for twelve hours and above daily, with the bulk of them spending between twelve and sixteen hours daily on the job.

Discussion

The findings on the research question of whether PPMVs have a medical background that facilitates the provision of contraceptive services to adolescents showed that almost two-thirds of the PPMV have basic training in medical practice, and about half are licensed to offer a wide range of clinical services, including contraceptive service for adolescents. The high level of willingness to be trained to offer quality services to adolescents is indicative of a predisposition to continuous learning by PPMVs and the opportunity to build capacity for increased quality of FP services. With the high proportion of trained providers and positive attitude towards adolescents, contraceptive services offered by PPMVs can easily be attractive to adolescents as also observed by [24]. Interestingly, the proportion of Health trained PPMVs of 43.1% found in this study is more than the national average of about 27% reported in the 2015 assessment of the Landscape of PPMV in sixteen states of Nigeria [28], thereby indicating a higher presence of health trained PPMV in Kaduna compared to many other states in Nigeria.

Furthermore, the finding on the second question on what contraceptive services are offered by PPMVs amidst regulatory restrictions shows that PPMVs, irrespective of qualification and training, offer a mix of family planning methods that include oral pills and injectables that are prescriptive drugs. The ability of PPMVs to offer a variety of modern contraceptive methods will ease access by making services available near to places of residence for adolescents. This will eliminate two major barriers to access by young persons, that is, transport cost and commodity stockout. The ability of PPMVs to limit stock-out of contraceptives is equally observed by [19]. Nevertheless, allowing non-health trained PPMVs to provide injectable contraceptives without formal training indicates that PPMVs are poorly regulated and therefore operate outside of their scope of practice [13, 14, 18]. Only about one-third are registered with the regulatory body, indicating that the majority of PPMVs are self-regulated. Self-regulation leading to non-compliance to the scope of practice may have been influenced by other motives for setting up the business, such as profit [12, 19]. Therefore, the Pharmacists Council of Nigeria needs to intensify and expand coverage of its regulatory activities to limit PPMVs from providing services for which they lack the requisite skills.

Finally, findings relating to whether PPMV operating space and time support confidential contraceptive services to adolescents show that PPMVs are positioned to attract adolescents due to flexible operating time and availability of space for confidential service. The observation of the flexibility in operating time is viewed by [12] as a competitive advantage for PPMV

among providers of contraceptive services. The observation of positive attitude and willingness among PPMV to offer contraceptive services to adolescents has the potential to mitigate stigma and break the barrier to access by adolescents as earlier documented by [29]. The observed potential of PPMV to provide youth-friendly services needs to be met by the demand among adolescents to seek services at PPMV. Therefore, research is required to understand the behaviour of adolescents toward PPMVs and to access the quality of contraceptive services that PPMV provide.

Conclusion

Patent and Proprietary Medicine Vendors are a mix of professionals with varied clinical and communication skills that can be deployed for the benefit of adolescents seeking contraceptive services. PPMV sell a range of contraceptives and are willing to make needed improvement in the knowledge and service space necessary for adolescent-friendly services. The Pharmacists Council of Nigeria should consider the review of Acts regulating the establishment and functions of PPMV to increase the scope of practice for PPMVs and collaborate with other regulatory and professional bodies to train PPMV to promote knowledge and skill for quality assured contraceptive services for adolescent. PPMV should be monitored to make a minor adjustment to the private space within the store to ensure adequate space that is safe for adolescents to access services.

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Conflict of Interest

The author is a staff of the Society for Family Health and previously worked on the IntegratE project.

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Impact of Environmental Taxation on Environmental Sustainability in Nigeria

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Abstract

Many nations have imposed environmental taxes to boost green development since green development has become a worldwide movement. Using a descriptive survey research approach, this study examines the influence of environmental taxes on environmental sustainability in Anambra State. The researcher devised two study questions and collected data using a self-created questionnaire. The personnel of the Anambra State Internal Revenue Service, chosen using a purposeful random sample procedure, makes up the sample size. Fifty copies of the questionnaire were administered for data collection. The data collected was analysed using the mean, standard deviation, and t-test statistics. The study found that environmental taxes encourage energy conservation and the adoption of renewable energy sources; Also, environmental taxation might create cash for governments, allowing for the reduction of other taxes or the implementation of environmental initiatives. Generally, the tax must be legal, and the rate must be predictable in order to encourage environmentally-friendly activities. It was advocated that understanding the effectiveness of environmental taxes and levies in instilling beneficial environmental behaviour is also important for ensuring that environmental pricing policies are designed in accordance with environmental aims. This research offers a practical and promising perspective on the function of environmental taxes in green growth, and it has the potential to be used in other regions and nations.

Keywords: *Environment, Environmental sustainability, Taxation.*

Introduction

Onitsha Governments are under growing pressure to develop solutions to lessen negative ecological impact while minimizing harm to economic growth as a result of environmental concerns. Regulations, information programs, innovation regulations, environmental subsidies, and environmental taxes are among the green policy tools available to governments [1]. Environmental taxes provide a number of significant benefits, including environmental efficacy, economic productivity, the potential to generate public funds, and openness. Environmental taxes are levied on activities that are destructive to the environment's health. They are essential to halting climate change because they are based on a simple principle: those who pollute pay. Environmental taxes have proven to be effective in addressing a variety of issues, including sewage treatment, water contamination, and air quality. The design of environmental taxes, as well as concerns of political economy in their application, are critical drivers of their overall economic consequences [2]. Environmental taxation is one of the environmental policy methods used to achieve green growth targets.

The environment refers to everything that surrounds us and provides us with food, water, and air to breathe, as well as all other essentials for everyday existence, and it inevitably comprises a life-support system. The atmosphere (air), the lithosphere (rocks), the

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hydrosphere (water), and the biosphere, or better still, living beings, are the basic components of the environment, according to Kachurin, Komashchenko, and Morkun [3]. However, population increase and unsustainable exploitation of natural resources have resulted in diminished biodiversity, greenhouse gas build-up, deforestation, hazardous spills, and environmental deterioration. As a result, environmental taxes may be found in economies all over the globe, and they are imposed on things like energy, transportation, natural resources, and pollution. The accounting records of Nigerian provincial and federal budgets reveal some usage of environmental taxes, according to a working paper published by the Central Bank of Nigeria; however, no uniform technique for recognizing, classifying, and assessing such monetization strategies has been discovered. As a result, the absence of a uniform approach may be owing in part to ambiguous interpretations of environmental taxes, which differ in theory and practice.

Environmental taxation is a significant economic policy instrument for central governments since it promotes society's and economy's long-term viability. Its meaning may be broad, but in general, it is a tax with predominantly environmental effects or a tax that controls the effects of particular green initiatives in a major way [4]. Selective excise taxes, the most important of which is the fuel tax, which accounts for a considerable portion of the tax ratio, are the primary environmental taxes in general. Environmental taxes offer rewards for people and corporations to incorporate environmental issues into business activities and reduce negative impacts on the environment by internalizing environmental costs (for example, activities that burden the environment will be taxed, whereas activities that contribute to the preservation of the environment will receive a tax break). Because environmental taxes create cash that may be used to fund additional environmental initiatives or reduce other taxes. Environmental taxes provide cash that can be utilized for environmental preservation or for non-environmental purposes. Environmental tax revenues can be used to reduce other taxes such as income tax, business tax, and social insurance premiums [5]. Environmental taxes, in principle, provide a pricing incentive to curb ecologically detrimental behaviour. In reality, though, many environmental levies are merely revenue-raising mechanisms with no intention of providing any environmental benefit. Due to these ambiguous definitions, it is easy to misread the computation of environmental taxes.

An environmental tax is a levy imposed by the government on activities or items that have a detrimental environmental impact. Environmental taxes are imposed in Nigeria on the fuel, infrastructure, health, and environmental assets tax bases. The federal gas tax, as well as provincial taxes on mineral usage and waste management, are examples of environmental taxes in Nigeria [6]. While it is evident that environmental levies are utilized in Nigeria, it is less clear how many and how much they cost. This is attributable to the fact that a methodology for gathering this data is still yet to be published in Nigeria. The additional problem is that statistics agencies' definitions of environmental taxes differ from how they are described in the publications [7].

Environmental issues related to the preservation and restoration of the natural environment occupy a significant position among global concerns of humanity at this phase of development in order to assure conformity with the goals of sustainable development. Environmental taxes are a classic tool used by the government to reduce the negative consequences of economic activities on the environment. Simultaneously, ongoing changes in environmental taxation systems in the pursuit of the most efficient system need the creation of methods to optimize the potential of

environmental taxes as a tool for reducing unreasonable environmental usage [8].

As a result, measuring the environmental effect of environmental taxes, as well as updating the criteria for using financial and economic levers of influence in order to improve their efficiency, is a pressing issue. Because of the magnitude of environmental issues and the rise in pollution, environmental policies and businesses must be directed in order to remove them and encourage them to seek out instruments of ecological and financial administration based on principles of sustainable development.

Theoretical Framework

From a theoretical standpoint, the notion of Environmentally Related Taxation (ERT) states that environmental levies and taxes help to safeguard the environment [9]. Although carbon emission reduction can be accomplished in a variety of ways, ERT and charges can encourage the market adoption of environmentally friendly mechanisms and reduce energy consumption, which is the primary source of CO2 emissions, by promoting energy efficiency and clean technologies [10]. Furthermore, tax shocks have the ability to improve the energy mix in favour of renewables, which are the greatest option for reducing emissions, by driving focused technical progress and green growth [11, \12]. Pollution charges also have an impact on regional deterioration, which has varying aspects depending on the economic, regional, or country. Standard economic perspectives, on the other hand, are concerned about taxes in general because of the contractionary impact they have on economic growth.

The basic concept is straightforward. An adverse externality occurs when the creation or usage of a thing causes harm to something other than the buyer or seller of that good. This is a market failure since the buyer and seller's decisions fail to account for the external cost. As a result, an unfettered free market will almost always produce an inefficiently large supply of any good with a negative externality. The externality can be corrected by levying a tax on the good that generates the externality. If the tax rate is equal to marginal external damage (the entire harm caused by one more unit of the product to persons other than the buyer and seller), the external cost is included in the transaction, guaranteeing that the buyer pays the full marginal social cost of the good. As a result, the tax incentive assures that the market provides the most efficient amount of the item (in the absence of any other uncorrected market failures).

From this perspective, a reduction in the output should result in a reduction in carbon emissions. The key idea here is that short-term views might be deceiving, but long-term experiences should be prioritized. Empirical research on the long-run behaviour of ERT will give insight into how carbon emissions react to ERT, taking into account both classic and current viewpoints on the subject. The question of whether ERT reduces CO2 emissions by managing economic growth and other associated variables has been the subject of empirical investigation.

Purpose of the Study

The main purpose of this study is to survey the impact of environmental taxation on environment sustainability in Anambra state. Specifically, it aims to determine the:

1. Impact of environmental taxation on environmental sustainability in Nigeria.
2. Strategies to enhance environmental taxation for environmental sustainability in Anambra State.

Hypothesis

The study is guided by the following hypothesis:

1. There is no significant difference on the views of male and female tax officers regarding the impact of environmental

taxation on environment sustainability in Anambra state.

Design of the Study

The survey research design was used for this project, which is a form of study in which a group of people or products is investigated by collecting and evaluating data from a small number of individuals or items that are deemed representative of the entire group [13]. This design was chosen since it has previously proven successful in comparable research.

Area of the Study

This research was carried out at Anambra State Internal Revenue Service (AIRS) Awka. Identifying taxpayers and taxable activities, determining assessable incomes, assessing activities to personal income tax and other applicable tax levies, collecting amounts assessed, and reporting assessment and collection activities are the primary functions of AIRS.

Secondly, AIRS is in charge of developing new revenue-generating sectors, checking conformity, enforcing defaults, and advocating such IGR-related efforts as the State Legislature may dictate.

Population, Sample, and Sampling Techniques

The employees of the Anambra State Internal Revenue Service in Awka were the study's target group. The study's sample consisted of fifty (50) employees, fifteen (15) men, and thirty-five (35) women, who were chosen using purposive sampling procedures.

Instrument for Data Collection

The instrument used for data collection was a questionnaire titled: 'Environmental Taxation Impact Scale (ETIS). The ETIS contained twenty items on a four-point scale of strongly agreed (SA=4), Agreed (A=3), Disagreed (D=2), and Strongly Disagreed (SD=1).

The overall theme of the items was based on the impact of environmental taxation on environment sustainability in Anambra state.

Validation of the Instrument

The questionnaire was handed to two specialists in measurement and assessment to analyse and make required modifications and comments in order to determine the instrument's face and content validity. These experts were given the study's aim and research questions, as well as the questionnaire items, to review and make any required revisions and comments. The researcher employed their feedback to make changes to the questionnaire's items before releasing the final version.

Reliability of the Instrument

The researcher employed five (5) tax officers that were not involved in the main study. They were given copies of the questionnaire to complete and these were collected right away. The questionnaire's contents were reorganized and altered before being given to the responders two weeks later. Person product-moment correlation was used to correlate the ratings of the data obtained.

Method of Data Collection

The questionnaire was individually conducted by the researcher. He gave each of the 50 responders 50 copies of the questionnaire. They were quickly gathered from the respondents; 50 copies of the questionnaire were obtained, yielding a 100% response rate.

Method of Data Analysis

The researcher utilized Mean and Standard Deviation to answer the study question while evaluating the data. The items' approval points were 2.5 on a scale of one to ten (ie $SA^{4,}$ SA^{3}, SD^{2}, D^{1}) totalling 10. Therefore, the Mean score equal $\frac{10}{4}$ = 2.5. Also, t-test statistics was also used to test for the hypothesis.

Results and Discussion

The results of the findings were presented in tables 1-2 and analysed using appropriate statistics.

Research Question 1: To what extent do environmental taxation impact environmental sustainability in Anambra State?

Table 1. Arithmetic Mean and Standard Dispersion of Responses of Male and Female Tax Officers on Impact of Environmental Taxation on Environment Sustainability

S/N	Item	Male		Female	
		$\bar{x}$	STD	$\bar{x}$	STD
1	Environmental taxes encourage energy conservation and the usage of renewable energy.	3.13	0.88	2.89	0.85
2	Anti-environmental behaviour is discouraged through environmental taxes.	2.93	1.00	3.31	0.71
3	Companies are compelled to innovate in the field of sustainability as a result of environmental taxes.	3.33	0.79	3.26	0.87
4	Environmental taxation creates cash for governments, enabling for the reduction of other taxes or the implementation of environmental initiatives.	3.00	1.03	2.91	1.13
5	People are enticed to avoid paying environmental taxes by using or producing less of the taxed commodity.	2.13	1.02	3.31	0.82
6	Pollution control expenses are reduced as a result of environmental taxes.	2.53	1.09	3.37	0.86
7	Environmental taxation promotes the development of innovative technologies, processes, and goods.	2.80	0.75	3.54	0.87
8	Environmental taxes might be used to directly solve environmental issues by encouraging people to engage in more ecologically friendly activities.	2.80	1.05	2.34	1.17
9	Environmental taxes are the most cost-effective technique of collecting revenue.	2.13	1.15	3.00	0.99
10	Environmental taxation offers authorities and companies more control over the future costs of anti-pollution programs.	2.67	0.94	3.43	1.05
Total		**27.45**	**9.7**	**31.36**	**9.32**

Table 1 shows the extent to which environmental taxation impact environmental sustainability in Anambra State. It was observed that environmental taxation could motivate companies to innovate in sustainability (Male=3.33, Female=3.26). However, the male and female respondents differ on environmental taxation and provision of incentives to avoid the tax by using or generating less of, the substance being taxed (Male=2.13, Female=3.31). Meanwhile, both male and female respondents agreed that environmental taxation promotes energy saving and the use of renewable sources. In all, items 1, 2, 3, 4, 6, 7, 8, and 10 having a mean score of 3.13, 2.93, 3.33, 3.00, 2.53, 2.80, 2.80, and 2.67, corresponding to a standard deviation of 0.88, 1.00, 0.79, 1.03, 1.09, 0.75, 1.05 and 0.94 were accepted, while item 5 and 9 with a mean score of 2.13 and 2.13 corresponding to standard deviation of 1.02 and 115 were rejected by the male respondents. Similarly,

items 1, 2, 3, 4, 6, 7, 9 and 10 having mean score of 2.89, 3.31, 3.26, 2.91, 3.31, 3.37, 3.54, 3.00 and 3.43 corresponding to standard deviation of 0.85, 0.71, 0.87, 1.13, 0.82, 0.86, 0.87, 0.99 and 1.05 were accepted, while item 8 with mean score of 2.34 corresponding to standard deviation of 1.17 were rejected by female respondents.

Research Question 2: What are the strategies to enhance environmental taxation for environmental sustainability in Anambra State?

Table 2. Arithmetic Mean and Standard Deviation of Responses of Male and Female Tax Officers on Strategies to Enhance Environmental Taxation for Environmental Sustainability in Anambra State

S/N	Item	Male		Female	
		$\bar{x}$	STD	$\bar{x}$	STD
11	Polluting conduct should be subject to environmental taxes.	3.07	0.93	2.71	1.00
12	The scope of an environmental tax should be as broad as the harm it is meant to alleviate.	2.93	1.00	3.11	0.78
13	The tax rate should be proportionate to the quantity of pollution caused.	3.27	0.68	3.11	0.92
14	The tax must be legal, and the rate must be predictable in order to encourage environmentally friendly activities.	2.93	1.06	3.43	0.55
15	Earnings from environmental tax reform can be used to supplement funds or to aid in the reduction of other taxes.	3.07	1.06	3.31	0.85
16	To reduce distributional implications, political courage and laws should be deployed.	2.53	0.81	3.17	0.84
17	Concerns concerning competitiveness must be thoroughly investigated, not to obstruct taxation, but to enable for policy cooperation.	3.33	0.87	3.26	0.91
18	Environmental taxes must be carefully articulated in order for the public to accept them.	3.60	0.49	2.31	1.37
19	Environmental taxes may need to be combined with other environmental measures to tackle specific problems.	2.40	1.02	3.63	0.54
20	Governments, academics, and stakeholders working together.	3.13	0.96	3.09	1.05
Total		**30.26**	**8.88**	**31.13**	**8.81**

Table 2 shows that male participants agree with a mean score of 3.60 and standard deviation of 0.49 that environmental taxes must be conveyed well in order for the public to accept them, whereas female respondents disagreed with a mean score of 2.31 and standard deviation of 1.37. Concerns regarding competition, on the other hand, must be thoroughly investigated, not to obstruct taxation, but to allow for policy coordination (Male=3.33, Female=3.26). Meanwhile, the male respondents disagreed that to solve specific difficulties, environmental taxes may need to be paired with other environmental initiatives (2.40). It is obvious that the tax rate should be proportional to the amount of environmental harm produced (Male=3.27, Female=3.11). On the whole, items 11, 12, 13, 14, 15, 16, 17, 18 and 20 with mean scores of 3.07, 2.93, 3.27, 2.93, 3.07, 2.53, 3.33, 3.60 and 3.13 corresponding to standard deviation of 0.93, 1.00, 0.68, 1.06, 1.06, 0.81, 0.87, 0.49 and 0.96 were accepted, while item 19 with mean score of 2.40 corresponding to standard deviation of 1.02 was rejected by male respondents. Similarly, items 11, 12, 13, 14, 15,

16, 17, 19 and 20 with mean scores of 2.71, 3.11, 3.11, 3.43, 3.31, 3.17, 3.26, 3.63 and 3.09 corresponding to standard deviation of 1.00, 0.78, 0.92, 0.55, 0.85, 0.84, 0.91, 0.54 and 1.05 were accepted respectively, while item 18 with mean score of 2.31 corresponding to standard deviation of 1.37 were rejected by female respondents.

Hypothesis 1: There is no significant difference in the views of male and female tax officers regarding the impact of environmental taxation on environment sustainability in Anambra state.

Table 3. Summary of t-test on Male and Female Tax Officers regarding the Impact of Environmental Taxation on Environment Sustainability

Source	N	Mean	Std. dev	t-cal	t-crit	d_f	P. Value
Male	15	27.45	9.7	1.3214	2.010	48.00	0. 1926
Female	35	31.36	9.32	-	-	-	-

Sig < 0.05

Table 3 shows that at a 0.05 level of significance and 48° of freedom, the calculated t = 1.3214 is less than the critical t = 2.010; therefore the hypothesis is accepted, and the researchers conclude that there is no significant difference on the views of male and female tax officers regarding the impact of environmental taxation on environment sustainability.

Discussion of Findings

The first research question was to see how many environmental taxes affects environmental sustainability in Anambra State. Environmental taxes, according to the report, encourage energy conservation and the adoption of renewable energy sources. This viewpoint was originally expressed by [14], who claimed that environmental taxes deter anti-environmental behaviour. Green taxes, according to [15]., are intended to make polluters pay a price that reflects the cost of their externalities. Environmental taxation, according to the findings, might create cash for governments, allowing other taxes to be reduced or environmental programs to be implemented. This is comparable to the findings of [16], who found that collecting environmental taxes and levies is a critical method for governments to produce public money that allows them to invest in human capital, infrastructure, and the provision of services to residents and enterprises. Environmental taxes are frequently cited as a critical component of more effective environmental protection. Environmental taxation stimulates the development of new technology, processes, and goods [17].

The second research topic focused on measures to improve environmental taxes in Anambra State in order to ensure environmental sustainability. Based on the findings, the respondents believed that polluting activity should be subject to environmental levies. However, the scope of an environmental tax should be as broad as the harm it is meant to alleviate [18]. The responder stated that in order for the public to accept environmental taxation for sustainable development, environmental taxes must be presented effectively. According to Farber [19], the tax rate should be proportionate to the quantity of environmental damage caused. The tax must be legal, and the rate must be predictable in order to encourage environmentally-friendly activities. The findings also suggest that revenue generated by environmental tax reform can be used as a source of additional financing or to help reduce other taxes. However, according to Li et al., [20] this same tendency implies less room for environmental improvement; in other words, governments must strike a balance between goals like increasing business redeployment, sustained development, and lower compliance

costs, as well as ensuring that the environmental tax system is fair and equitable.

Implications for Policy Makers

Environmental taxes and levies can be an effective policy solution to address environmental externalities in the economy. However, in Nigeria, a uniform approach for calculating and characterizing these instruments has yet to be defined, making it impossible to examine the present usage of environmental taxes and levies. The influence of taxing on economic growth, in particular, must be considered when considering the link between environmental taxation and sustainability. Many studies suggest that taxes have a detrimental influence on economic growth, particularly direct taxes, which are much more so if they are progressive. Indirect taxes can also help boost economic development, especially if they're utilized to fund beneficial government expenditure, which might include environmental spending in some cases. As a result, the optimum circumstance is when environmental taxes are classified as indirect taxes or excise taxes. Environmental taxes, such as excise taxes, must therefore be properly incorporated into the tax mix such that overall taxation promotes environmental activities and economic sustainability while also incentivizing polluters to utilize innovative, environmentally friendly technology. It has also been demonstrated that there is a relationship between economic growth and the effectiveness of environmental tax collection, particularly when the environment is seen as a critical component of the economy.

The research conducted by Sustainable Prosperity gives a preliminary assessment of the worth of environmental taxes and levies in Nigeria. This estimate serves as a starting point for determining the scope and value of environmental taxes and levies in Nigeria, as well as a first step in determining how the design of these fiscal instruments may help the country achieve its environmental goals. While this research is useful in classifying environmental taxes, it leaves many problems unsolved. Policymakers might benefit from more research on the design and goals of particular environmental taxes and levies in order to better understand the effect of such fiscal instruments. Understanding how successful environmental taxes and levies are at instilling beneficial environmental behaviour is important for ensuring that environmental pricing systems are designed in accordance with environmental goals.

Conclusion

The research was able to look at the influence of environmental taxes on environmental sustainability in the state of Anambra. The findings of this study reveal that environmental taxes encourage energy conservation and the adoption of renewable sources of energy; they also show that environmental taxes discourage anti-environmental behaviour and encourage businesses to innovate in sustainability. The research also suggested that polluting conduct should be subject to environmental fees. The research also said that in order to encourage environmentally-friendly activities, the tax has to be legal, and the rate has to be predictable.

Environmental taxation, according to the experts, fosters innovation, which may lead to new technologies, processes, and products; the study's findings will allow governments to produce cash, allowing other taxes to be reduced or environmental initiatives to be implemented. As a result, environmental taxes may benefit from the study in terms of communicating properly in order for the public to accept it. The tax must be legal, and the rate must be predictable in order to encourage environmentally-friendly activities. Government officials may use the findings of this study to motivate others and create a climate that allows for successful tax collection management while also ensuring Nigeria's environmental sustainability.

This article demonstrates that, while the Nigerian environment is continually under attack from a variety of threats, government attempts to address these threats have not been properly streamlined to stop the tide. It has been demonstrated that the majority of policies, including labour regulations, are mostly ineffectual since they are void and even reverse the effects of others. This paper recommends that realistic policies and legal frameworks be implemented in order to align government policies across industries. When the execution of one policy erodes the benefits of another, society's growth objectives become stagnant. As a result, government policy must presume people-centered concepts of development, which envision wholistic interventions rather than merely peripheral activities, if it is not to become just rhetoric. In order to maintain the economy's long-term viability and growth, the government should establish a welcoming and enabling climate for both businesses and investors to prosper. To avoid full decadence, the development and upkeep of all infrastructure facilities should be of essential significance.

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Predicting the Risk of in-Hospital Mortality in Patients with HIV-Associated Talaromyces Marneffei Infection

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Abstract

Disseminated Talaromyces marneffei infection (formerly termed penicilliosis) is the third most common microbiologically confirmed opportunistic infection in Southeast Asia, with mortality of up to 30% despite antifungal therapy. There are restrictive clinical algorithms to predict treatment outcomes. A total of 513 patients with microbiology-confirmed HIV-associated talaromycosis were included in the analysis. Poor outcome was observed in 143/513 patients (27.9%). In the univariate logistic regression analysis, hepatomegaly and splenomegaly were protective factors. Shorter duration of illness, higher respiratory rates, dyspnea, AIDS-associated central nervous system syndromes, platelet counts <50,000 cells/mL, aspartate transaminase (AST) >300 U/L, alanine transaminase (ALT) >150 U/L, serum creatinine >110 µmol/L were predictors of poor outcome. In the multivariate logistic regression analysis, shorter days of illness, higher respiratory rates, platelet counts <50,000 cells/mL, AST >300 U/L and serum creatinine >110 µmol/L, active tuberculosis (TB) and/or ongoing TB induction treatment and AIDS-associated central nervous system syndromes were independent predictors of poor outcome. The prognostic scores ranged from 0 to 19, corresponding to a mortality risk of 0% to 100%. The internal validation showed acceptable discrimination (AUC=0.68) and calibration slope (0.93). The Brier score for model performance was 0.14. We developed a simple scoring system that can predict the risk of death in patients with HIV-associated talaromycosis based on routinely measured characteristics on admission. The scoring system will be further externally validated using other cohorts in the region.

Keywords: *Talaromyces marneffei, Invasive fungal infections, Mortality, Prognostic model, Vietnam.*

Introduction

Talaromyces marneffei (Tm) is a dimorphic fungus that can cause a life-threatening systemic infection in immunocompromised individuals living in or traveling to Southeast Asia and southern China [1, 2]. Rare before the HIV epidemic, talaromycosis has rapidly emerged in this region as a leading HIV-associated opportunistic infection and bloodstream infection [3, 4], accounting for 15% of HIV admissions annually [5-9]. The Tm mortality on antifungal therapy is up to 30% [5-10]. Despite its rapid emergence and significance, talaromycosis remains neglected [11].

[5] conducted a retrospective analysis in Ho Chi Minh City from 2004-2009 and identified injection drug use, absence of fever or skin lesions, high admission respiratory rates, and low platelet counts to be independent predictors of death. [6] evaluated 127 patients in Hanoi in 2012 and identified admission dyspnea, presence of ascites, and increased blood lactate dehydrogenase levels to be independent predictors of death. Other risk factors of Tm

mortality included co-infection with tuberculosis or hepatitis C [7]. Pre-existing studies are limited by being single-center experience, having relatively small sample sizes, and generally lacking the robust statistical analysis and power to assess the risk of Tm death. Therefore, I aimed to develop a prognostic model and construct a simple clinical scoring system to assist clinicians in the rapid prognosis and timely management of patients at the bedside in order to reduce disease mortality.

Materials and Methods

Ethics Statement

We used the secondary dataset from a large retrospective study during 1996-2009 of patients with *Talaromyces marneffei* infections admitted to the Hospital for Tropical Diseases in Ho Chi Minh City, Vietnam [5]. The study dataset was permitted and provided by the principal investigator of the study in compliance with the principles in Good Clinical Practice and Helsinki Declaration. This study was approved by the Scientific and Ethical Committee of the Hospital for Tropical Disease, Ho Chi Minh City, Vietnam (approval number CS/ND/09/19) [5].

Study Setting, Design, and Population

The retrospective study included all patients hospitalized with talaromycosis from July 1996 to December 2009 at the Hospital for Tropical Diseases (HTD), Ho Chi Minh City, Vietnam. In brief, HTD is the biggest tertiary referral hospital for tropical diseases in southern Vietnam. Tm infection cases were searched and identified from microbiology records, which encompassed all culture data. In addition, hospital charts with a primary discharge diagnosis of penicilliosis, *P.marneffei* (formerly name of *T.marneffei*) were also searched. All patients were double-checked for duplicated records. Finally, a total of 513 patients were included in the study.

Study Definitions

Talaromycosis was defined as any disease condition that *Talaromyces marneffei* was isolated from blood, skin scrapings, lymph node, bone marrow and/or anybody's fluid samples [5, 12]. Isolation and identification of *Talaromyces marneffei* were performed in accordance with the standard culture techniques.

Clinical Outcomes and Candidate Predictors

In-hospital outcomes were classified as (i) death, (ii) worsening disease at hospital discharge (dramatically deteriorated clinical status and expected to die at home after discharge) (iii) improvement (iv) non-assessability (unchanged and without following doctor's advice). For study analysis, poor outcome was defined as death and worsening disease at discharge (died at home), good outcome was characterized as improvement and non-accessibility was manipulated as missing data.

Pre-defined covariables used in the model included age, sex, history of injection drug use, comorbidities, and clinical and laboratory characteristics at hospital admission. These covariates were preselected based on clinical experience and evidence from published literature [5-7].

Data Collection

We used the secondary data from a large retrospective Tm study during 1996-2009 of patients with *Talaromyces marneffei* infections admitted to the Hospital for Tropical Disease in Ho Chi Minh City, Vietnam [5]. For the primary data, clinical and laboratory information were collected and entered into separate case record forms, then gathered data were independently double-checked into database to ensure the data integrity.

Statistical Analysis

We performed a logistic regression analysis and developed a simple risk prediction model for HIV-associated talaromycosis, using data from a retrospective cohort [5]. Backward stepwise selection based on Akaike Information Criterion (AIC) was conducted to identify the strong independent predictors of Tm mortality in the final model. Multiple imputations using chained equation (MICE) was used for missing values of AST (19% missing) and serum creatinine (11% missing). Bootstrapping (500 times) was used for internal validation of the final model. We compared the modelling performance by the area under the ROC curve (AUC), calibration-in-the-large, and calibration slope of the logistic regression model [13]. Based on the coefficients of predictors, a simple prognostic score was developed to estimate the risk of death. All study analyses were conducted with statistical software R, version 4.1.1, and the companion R package MICE was applicable for multiple imputations [14, 15].

Results

Clinical Characteristics of Study Participants

The baseline clinical characteristics are presented in Table 1. The median age of patients was 28 years (interquartile range (IQR), of 25-32 years), and 82% of participants were male. Roughly 70% of participants had a history of intravenous drug use, and 20% of patients were receiving antiviral therapy. The major clinical characteristics of Tm patients included fever, malaise, pale skin and mucosa, skin lesions, hepatosplenomegaly, diarrhea, and dyspnea.

Table 1. Baseline Clinical Characteristics and Outcomes of Study Participants (N=513)

Characteristics	**Statistics***
Age, years	28 (25-32)
Male sex	421 (82)
History of intravenous drug use (yes)	332/485 (68)
Receiving ARV (yes)	103 (20)
Clinical Characteristics	
Days of illness	15 (7-30)
Fever	419 (82)
Malaise	239 (47)
Diarrhea	150 (30)
Weight loss	92 (18)
Pale	286/397 (72)
Skin lesions	346/487 (71)
Hepatosplenomegaly	286 (56)
Lymphadenopathy	131 (26)
Dyspnea	117/468 (25)
Laboratory Findings	
Hemoglobin level, g/dL	08 (06-9.8)
Absolute lymphocyte count, cells/µL	395 (232-696)
Platelet count, $x10^3$ cells/ µL	82 (42-150)
AST, U/L	122 (63-230)
ALT, U/L	60 (34-119)
CD4 cell count, cells/ µL	07 (4-24)
Radiological Findings	

Abnormal chest x-ray	357 (70)
Abnormal sonography	312 (60)
Hepatomegaly	197/312 (63)
Splenomegaly	176/312 (56)
Abdominal lymphadenopathy	159/312 (33)
Ascites	73/312 (23)
Positive Culture and Identification of *T.marneffei*	
Blood	395/472 (84)
Skin scrapings	186/195 (95)
Lymph nodes	17/20 (85)
Outcomes	
In-hospital death	101 (19.7)
Deteriorated and died at home	42 (8.2)
Good outcomes	370 (72.1)

*****Summary statistic is median (interquartile range, IQR) for continuous variables and frequency (%) for categorical variables

Most frequently seen laboratory abnormalities were anemia, thrombocytopenia, and elevated transaminase levels. Isolation of *T.marneffei* from clinical specimens with the highest sensitivities were obtained from skin scrapings, blood, and lymph node. The recent median CD4 count was 07 cells/µl (IQR, 4-24 cells/µl). In terms of radiological findings, 70% of patients had abnormal chest x-ray, and 60% had abnormal sonography findings.

Treatment and outcomes

Out of 513 patients, outcomes at discharge were an improvement in 347 (67.6%), death in 101 (19.7%), worsening in 42 (8.2%), and non-assessable in 23 (4.5%). Poor outcome was observed in 143/513 patients (27.9%).

Prognostic Modelling and Scoring System Development

In the univariate logistic regression analysis, hepatomegaly and splenomegaly were protective factors. Shorter duration of illness, higher respiratory rates, dyspnea, AIDS-associated central nervous system (CNS) syndromes, platelet counts <50,000 cells/mL, aspartate transaminase (AST) >300 U/L, alanine transaminase (ALT) >150 U/L, serum creatinine >110 µmol/L were predictors of poor outcome. In the multivariate logistic regression analysis, shorter days of illness, higher respiratory rates, platelet counts <50,000.

cells/mL, AST >300 U/L and serum creatinine >110 µmol/L, active tuberculosis and/or ongoing TB induction treatment, and AIDS-associated central nervous syndromes were independent predictors of poor outcome (Tables 2 and 3). The internal validation showed acceptable discrimination (AUC=0.68) and calibration slope (0.93) (Figure 1). The Brier score was 0.14. The prognostic scores ranged from 0 to 19, corresponding to a mortality risk of 0% to 100% (Table 4 and Figure 2).

Table 2. Multivariable Complete-Case Analysis (N=389)

Covariates	**Coefficient**	**OR**	**95% CI**	***P* value**
Days of illness [-7 days]	0.126	1.12	1.03 - 1.21	0.01
Respiratory rate [+10 breaths per minute]	1.094	2.99	2.09 - 4.42	< 0.01
Platelet count [-50 K/mm^3]	0.179	1.16	1.03 - 1.29	0.02
AST > 300 U/L	0.759	2.14	1.15 - 3.95	0.02

Creatinine > 110 µmol/L	1.185	3.27	1.85 - 5.83	< 0.01
Probable TB or TB on the first 2-months of treatment	0.993	2.70	0.86 - 8.28	0.08
CNS-associated syndromes	3.025	20.6	7.82 - 65.72	< 0.01

Table 3. Multivariable Analysis with Multiple Imputation (N=513)

Covariates	**Coefficient**	**OR**	**95% CI**	***P* value**
Days of illness [-7 days]	0.117	1.11	1.03 - 1.19	< 0.01
Respiratory rate [+10 breaths per minute]	1.033	2.81	2.02 - 3.90	< 0.01
Platelet count [-50 K/mm^3]	0.249	1.22	1.11 - 1.32	< 0.01
AST > 300 U/L	0.836	2.31	1.26 - 4.22	< 0.01
Creatinine > 110 µmol/L	0.920	2.51	1.50 - 4.20	< 0.01
Probable TB or TB on the first 2-months of treatment	1.159	3.19	1.16 - 8.72	0.02
CNS-associated syndromes	3.351	28.53	10.31 - 78.88	< 0.01

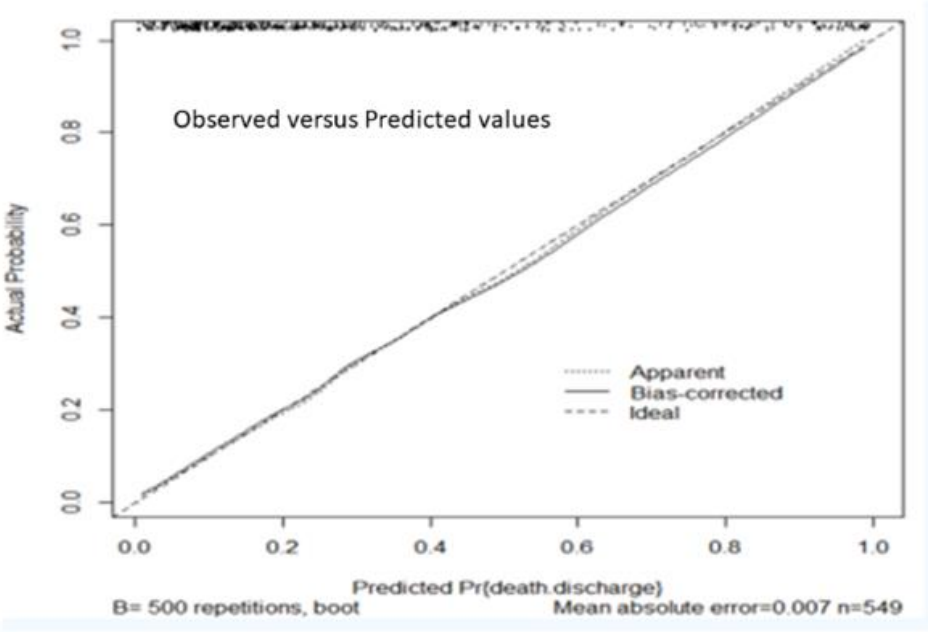

Figure 1. Calibration Plot Reveals Good Consistency between Predicted and Observed Values

Table 4. Risk Score to Predict Risk of Tm Mortality based on Complete-Case Analysis

Covariates	**Subcategory**	**Reference values**	**Sub-coefficient**	**Risk score**
Days of illness (days)	<7	-	0.474	1
	≥ 7	Reference	0	0
Respiratory rate (breaths per minute)	≤ 22	Reference	0	0
	>22 to ≤ 32	-	0.673	2
	> 32	-	2.360	5
Platelet count (K/mm^3)	< 50	-	0.496	1
	≥ 50	Reference	0	0
AST (U/L)	< 300	Reference	0	0
	≥ 300	-	0.765	2
Creatinine (µmol/L)	< 110	Reference	0	0

	≥ 110	-	1.053	2
Probable TB or TB on the first 2-months of treatment	No	Reference	0	0
	Yes	-	1.046	2
CNS-associated syndromes	No	Reference	0	0
	Yes	-	2.950	6
Intercept	-	-	- 2.741	-

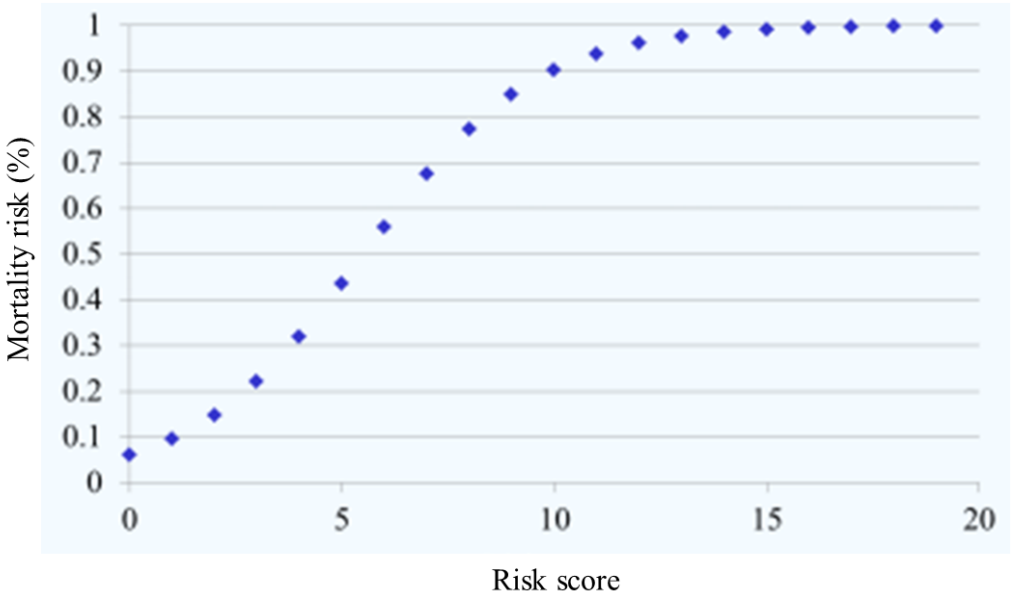

Figure 2. A Scoring Chart to Predict in-hospital Tm Mortality

Discussion

This study assessed the risk factors for poor outcomes in hospitalized patients with talaromycosis. Importantly, factors including shorter days of illness, higher respiratory rates, platelet counts <50,000 cells/mL, AST >300 U/L, serum creatinine >110 μmol/L, active tuberculosis and/or ongoing TB induction treatment, and HIV-associated CNS syndromes were independent predictors of Tm mortality. Previous Tm studies were restricted by being single-center experience, having relatively small sample sizes, and lacking advanced statistical analysis and power [5-7]. Despite several developed models to predict Tm risk of death, the previously reported prognostic models encompassed a plethora of covariates, which hampered its quick utility and convenience [17, 18]. Nonetheless, Qin Y *et al.* constructed and validated Tm prognostic model for mortality with only four strong predictors including age, liver transaminases, albumin and blood urea nitrogen [19]. Although Qin Y *et al.* report the developed model with area under the curve (AUC) of 0.793, the proposed Tm predictive model for death substantially lacked significant clinical predictors, for instance respiratory failure, tuberculosis and CNS-associated diseases previously reported as the strong predictor of Tm mortality [5, 7]. On this basis, we aimed to develop a robust prognostic model, a simple clinical algorithm, and a scoring system with only 07 robust clinical predictors to assist clinicians in the rapid prognosis and timely intervention of Tm patients. Our prediction model provides a useful tool to predict Tm mortality based on clinical and laboratory parameters routinely collected at hospital admission. The candidate predictors and outcomes were well predefined, and the model was well-developed and internally validated on the basis of standard statistical methodology to reduce the optimism effect [13, 16]. The final predictive model

revealed acceptable discrimination (AUC= 0.68) and good calibration values. Additionally, the Brier score used to measure model performance was 0.14 (acceptable range: 0 to 0.25) [20]. These parameters indicate our developed model has good prediction and performance values for Tm mortality and can be widely applicable in clinical practice.

We also simplified the final predictive model for Tm death to a risk scoring chart, allowing clinicians to make a rapid evaluation of patients' risk of severity and to aid physicians in decision-making. Despite a slight loss of precision [13], the scoring chart is easily comprehensible and applicable at the bedside. The risk score can be integrated into smartphones for quick utility. Using this Tm mortality risk score, clinicians can sort out patients at high risk of death based on routine clinical and laboratory parameters in the emergency department; therefore, they can rapidly determine who will require early and intensive interventions in order to minimize the talaromycosis-associated mortality.

Our study had several limitations. Firstly, there was a considerable percentage of missing data with regards to AST and creatinine values, regarding that these parameters were significant predictors of the final Tm mortality risk model. Secondly, our model was developed for hospitalized patients. Hence the study results could not be generalized to clinic-based outpatients. We only performed the internal validation, and there is a substantial need for further external validation.

Conclusion

We developed a simple scoring system that can predict the risk of death in patients with HIV-associated talaromycosis, based on routinely measured characteristics on hospital admission. The scoring system will be further externally validated using other cohorts in the region.

Financial Support and Sponsorship

The study was self-funded.

Conflicts of Interest

There is no conflict of interest.

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Assessing Teachers' Knowledge in Analysing Errors in Mathematical Word Problems of Ghanaian Primary School Pupils

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Abstract

The survey investigated teacher knowledge in analysing pupils' wrong answer solutions in mathematical problem-solving. A sample of 205 pupils and teachers from 35 Islamic primary schools in the Greater Accra Region of Ghana were surveyed. The teachers were sampled through quota sampling, while the pupils were selected via stratified random sampling. A questionnaire and achievement test were used for the survey. Frequency count, percentage, and chi-square test *were used as statistical tools for data analysis. The study found that the majority (71.4%) of the primary school teachers in the Greater Accra Region had difficulty preparing a good marking scheme. Also, more than 60% of the teachers were unable to identify and analyse the errors of pupils as well as communicate feedback on the errors. The study found no statistically significant association between knowledge of error analysis and analysing wrong answer solutions ($p>0.05$). This study concluded that most primary school teachers in the Greater Accra Region of Ghana do not have enough knowledge in analysing mathematical wrong answer solutions of pupils by using Newman's model synthesis. It is recommended that mathematics teachers in Ghanaian basic schools should use Newman's model as a standard method of analysing pupils' work. For this reason, Ghana Education Service, Ghanaian universities, and colleges of education should include Newman's model during the training of mathematics teachers.*

Keywords: *Achievement test, Mathematical word problem, Newman's model, Wrong answer analysis.*

Introduction

In Ghana, the language demands of the mathematics curriculum are important and need to be developed by pupils. Pupils' ability to transform word problems into mathematical models is a skill that is crucial in mathematical information management. This is because by solving mathematics problems, pupils have the opportunity to demonstrate and develop certain cognitive abilities such as generalization, reasoning, data analysis, and the use of a variety of representations and strategies [1]. This brings to the fore pupils' understanding, comprehension skills, and analysis of real-life situations using mathematical models.

At the upper primary school levels, most errors in mathematics tests and examinations are caused by Reading, Comprehension, Transformation errors, or Carelessness [2]. This is as a result of the difficulties experienced with mathematics by pupils [3]. What explains why problem-solving activities are found in most mathematics textbooks? It is worth noting that word problem solving is not a topic by itself in the teaching syllabus, although nearly all topics include word problem solving as activities as indicated by the Ministry of Education [MoE] of Ghana [4].

It is well recognized that pupils struggle with both the literacy and mathematical demands of typical mathematical word problems. For this reason, many teachers and pupils seem to dislike

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word problems. Translating word problems into solvable equations and relations is one area of mathematics that pupils have a great deal of difficulty with (evident). The Chief Examiner's report from the West African Examination Council (WAEC) [5] revealed that pupils were unable to translate word problems into mathematical language and to use mathematical symbols to enable them to solve problems.

For example, pupils' solutions to the problem: Find the value of $x\ if\ \frac{3x-2}{5}$ is greater than $\frac{1-4x}{12}$ by 5 was varied in nature (WAEC Report, 2008).

Most of the candidates gave literal mathematical interpretation of the problem.

In writing the statement in symbols, they wrote:

$$\frac{3x-2}{5} > \frac{1-4x}{10}\ x\ 5$$

instead of

$$\frac{3x-2}{5} = \frac{1-4x}{10} +\ 5$$

which solves to obtain x = 5.5.

The mathematical wrong answer is an answer with either a wrong method (procedure) or incorrect final answer, or both (source). Wrong answers are a common phenomenon in pupils' mathematical problem-solving skills. School pupils, irrespective of their performance in mathematics, have once experienced wrong answers in mathematics [2]. Newman attributed the sources of errors to these factors, namely, reading, comprehension, transformation, application of processes skills, and encoding [6]. However, reading, comprehension, and transformation collectively contribute over 50% of the sources of working errors that pupils commit in solving word problems. More than 50% of the errors committed by the pupils in the course of solving mathematical word problems occur before the stage of process skills in Newman's hierarchy of errors. Apart from the five identified sources of errors, carelessness has also been noted to be another major source of error. Pupils may, at times, arrive at wrong solutions to problems not due to the lack of understanding of the problem or concept but due to carelessness. In Ghana, one of the reasons why pupils perform poorly in Mathematics is because most pupils lack proper feedback from teachers any time they wrongly solve a mathematical problem. There is enough evidence that suggests that teachers lack knowledge of wrong answer analysis [7].

Although educators observed that pupils are generally performing poorly in word problem-solving tasks, teachers are also consistently failing to rectify the underlining cause (Cross, 2008). Teachers fail to analyze and identify pupils' wrong answer solutions to mathematical problem-solving in other to provide remedy [8]. For this reason, suggestions have been made to assist teachers in identifying the sources of errors. A reflective assessment or analysis of the answer may thus reveal the source of error, leading to its correction or rectification. In this direction, pupils must be made to provide a written explanation or justification for the solution to the problem. Wrong answer analysis by teachers is a fundamental aspect of the teaching process. A teacher's understanding of pupils' wrong solutions to mathematical tasks guides the teacher in preparing lessons in mathematics and also for remedial teaching [7, 9]. People argue that teachers must give attention to wrong answers since this will increase teachers' knowledge of pupils' mathematical errors. Teachers should thus have a holistic view of what they teach in class. This process of having will enable teachers to investigate pupils' line of thinking systematically. Researchers [10,11] have shown that the analysis of the wrong answer solution method of teaching has the greatest impact on pupils' critical thinking. In their opinion, it gives the teacher the opportunity to analyze and identify the source of error and the thinking process of pupils [11]. Similarly, Berk et al. were of the view that wrong answer solution analysis provides teachers with the ability to identify the source of the error, why the errors are made and the thinking ability of their pupils [10].

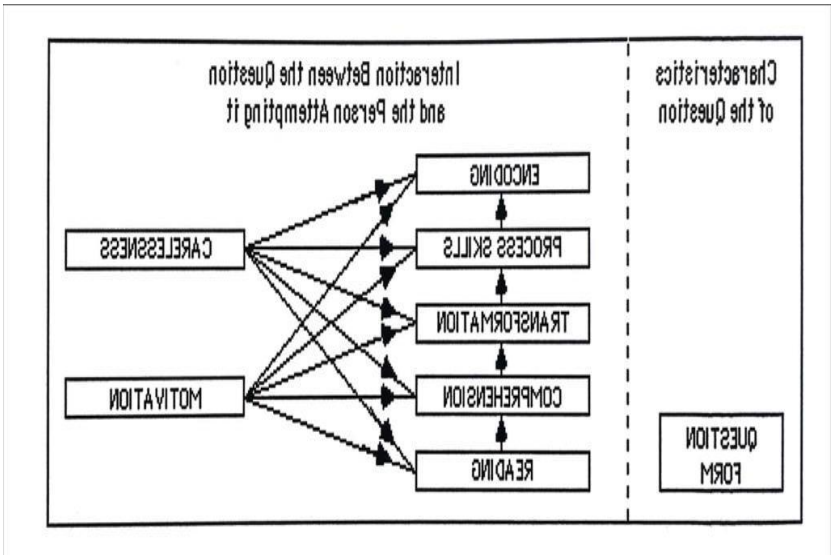

Figure 1. Hierarchy of Causes of Error as illustrated by Clements (1980)

Teacher knowledge in this paper is the ability to construct and use comprehensive marking schemes appropriately. Teachers' inadequate knowledge in analyzing pupils' wrong answers makes them to adopt the wrong approach to marking only the final answer arrived at by the pupils as right or wrong. Once they do not analyze the working process of the pupils, they are unable to detect the actual sources of errors. Educationists, teachers, policymakers, and researchers continually search for effective ways to improve the word problem-solving abilities of pupils in basic schools. Within wrong answer, analyses are embedded sequential and hierarchical errors, which can be described in a mathematical model proposed in 1983 by Newman [15]. In most cases, the teacher marks the answer wrong without considering pupils' thought processes and cognitive capabilities. This brings to light Newman's Model Synthesis of error identification and analysing in mathematics which is illustrated by Clements [12] in Figure 1.

According to Newman, a person wishing to obtain a correct solution to a one-step word problem must ultimately proceed according to some form of hierarchy [6]. To her, this hierarchy considers the issue of language as the first step in identifying the child's area of difficulty in word problem-solving. Newman suggested the following hierarchy was suggested: reading the problem; comprehending what is read; carrying out a mental transformation from the words of the question to the selection of an appropriate mathematical strategy (transformation); applying the process skills demanded by the selected strategy, and encoding the answer in an acceptable written form [6]. Newman used the word "hierarchy" because she reasoned that failure at any level of the above sequence prevents problem solvers from obtaining satisfactory solutions [13].

According to Clements, errors arising from the nature of a factor are essentially different from those in the other categories since the source of difficulty resides fundamentally in the question itself rather than in the interaction between the problem solver and the question [12].

Clements continued by stating that two other categories, "Carelessness" and "Motivation," may be demonstrated as separate from the hierarchy, although these types of errors can occur at any stage of the problem-solving process [12]. A careless error could be a reading error or a comprehension error. Similarly, someone who had read, comprehended, and worked out an appropriate strategy for solving a problem might decline to proceed further in the hierarchy because of a lack of interest.

Casey pointed out that problem solvers often return to lower stages of the hierarchy when attempting to solve problems [14]. Casey further indicated that in the middle of a complicated calculation, a child might decide to re-read the question to check whether all relevant information has been taken into account [14]. However, even if some of the steps were re-read during the word problem-solving process, Newman's hierarchy provides a fundamental framework for the sequencing of essential steps [6]. Along with the hierarchy, Newman recommended that an interview of pupils should be carried out in order to classify pupils' errors on written mathematical tasks [15]. In view of that, Newman suggested the following interview guide: the prescription is as follows: a) Please read the question to me. (*Reading*); b) Tell me what the question is asking you to do (*Comprehension*); c) Tell me a method you can use to find an answer to the question *(Transformation);* d) Show me how you worked out the answer to the question. Explain to me what you are doing as you do it *(Process Skills)*; e) Now write down your answer to the question *(Encoding)* [6]. If pupils who originally got a question wrong get it right when asked by an interviewer to do it once again, the interviewer should still make the five requests in order to obtain information on whether the original error could be attributed to carelessness or motivational factors.

According to Lemos, there is more empirical evidence on the impact of Newman's model synthesis in evaluating pupils' performance in the international literature, and none whatsoever for developing countries [16]. The international literature mainly utilizes the synthesis to appraise performance perhaps, because little research has been carried out in developing countries. Although Newman's hierarchy was helpful for the teacher, it could conflict with an educator's aspiration that the learner ought to experience his/her own capability by developing his/her own methods and ways [17]. The demonstration is thus carried out on the bases that there is no conflict. This is because the Newman's hierarchy cannot be considered a learning hierarchy in the strict sense of the expression by Kaphesi who explained that Newman's framework for the analysis of errors was not put forward as a rigid information processing model of problem solving [18]. According to him, the framework was meant to complement rather than to challenge descriptions of problem-solving processes such as those offered by [19]. With the Newman's approach, the teacher is attempting to stand back and observe an individual's word problem-solving efforts from a coordinated perspective; Polya on the other hand, was most interested in elaborating the richness of what Newman termed Comprehension and Transformation [19].

In most Ghanaian classrooms, scoring in mathematics by teachers is by "winner takes all", rather than by the "partial credit scale". Pupils' responses to questions or exercises are simply marked either right or wrong without considering the solution path. The Ghana Education Service - Science, Technology, and Mathematics Education, in collaboration with Japanese International Corporation Agency [GES-STME-JICA], at a workshop for teachers, observed that pupils' responses to questions or exercises are simply marked with a "cross" (X) for a wrong answer, or a "tick" (√) for a right answer [20]. This method of marking does not really indicate what a pupil did wrong or present a counter suggestion to a pupil's line of thinking. It is against this backdrop that this paper sought to investigate mathematics teachers' knowledge in applying Newman's model of analysing errors in mathematical word problems of Ghanaian primary school pupils in the Greater Accra Region.

Materials and Methods

This study adopted the cross-sectional survey design. The target population for this study was 42 head teachers, 252 class teachers, and 7083 pupils from 42 Islamic primary schools in the Greater Accra Region of Ghana. The Islamic

primary schools in the Greater Accra Region were purposively selected for the study because it is among this group of schools that the problem was discovered during a workshop in Science, Technology, and Mathematics Education. A random sampling technique was used in selecting 35 schools out of the 42 Islamic primary schools.

Sample of 205 made up of 105 primary school pupils, and 105 teachers were selected from 35 out of 42 Islamic primary schools. The 105 teachers made up of 70 females, and 35 males were sampled through quota sampling technique. Stratified random sampling was also used to select 100 pupils for the study. Questionnaire of Cronbach's alpha coefficient (α) of 0.70 was used for the survey. Achievement test was also used to generate data for the study. The achievement test was diagnostic in nature and was used to assess teachers' level of knowledge of wrong answer analysis and common errors that pupils commit. To generate the achievement test, 100 class five pupils were randomly selected from five schools. The achievement test was based on the basic five mathematics syllabus. Test papers of four pupils were randomly selected and given to each teacher to prepare a marking scheme, mark, and score. They were also asked to identify pupils' error(s) (if any), suggest reason(s) for the errors identified, and offer remedies for correcting the error. The Statistical Package for Social Sciences version 26 was used to analyse the data using descriptive statistics (frequency count, percentage) and inferential statistics (chi-square test).

Results

Table 1. Teacher Preparation of Marking Scheme (n = 105)

Marks	**No. of teachers**	**Percentage**
1-3	23	21.9
4-6	34	32.4
7-9	18	17.1
10-12	22	21.0
13-15	8	7.6
Total	105	100

In Table 1, the item 'Marks', numbering from 1 to 15, were the marks scored by teachers. From the result, 23 (21.9%) teachers scored between 1 and 3 out of 15 marks, 34(32.4%) scored between 4 and 6 marks, 18 (17.1%) scored between 7 and 9 marks, while 22(21%) teachers scored between 10 and 12 marks. Only 8(7.6%) respondents scored between 13 and 15 marks. This result is an indication that the majority (71.4%) of the Islamic primary school teachers in the Greater Accra Region of Ghana had difficulty preparing a good marking scheme for their class tests. Respondents used the prepared marking scheme to mark the sampled class test of pupils. This is presented in Table 2.

Table 2. Marking of Class Test of Pupils by Teachers (n = 105)

Marks	**No. of teachers**	**Percentage**
1-3	19	18.1
4-6	29	27.6
7-9	34	32.4
10-12	18	17.1
13-15	5	4.8
Total	105	100

In Table 2, 5(4.8%) teachers scored between 13 and 15 marks, while 18(17.1%) scored 10-12 marks. The majority (82), representing 78.1% of teachers, scored below 10 out 15 marks. From the analysis, it could be inferred that even teachers who prepared a good marking scheme could not adhere to it in their marking and scoring. Since respondents could not prepare a good marking scheme, they could therefore not score the test well. It was observed that marks were allotted indiscriminately.

For some respondents, the total marks scored for a question was more than the marks allotted for the question.

Table 3. Teachers' Knowledge of Error Analysis (n = 105)

Statement	**Response**			
	Yes		**No**	
	Freq.	**%**	**Freq.**	**%**
Make an attempt to identify errors	35	33.3	70	66.7
Able to identify errors	28	26.7	77	73.3
Able to analyse errors	26	24.8	79	75.2
Able to understand pupils' thinking	16	15.2	89	84.8
Communicate error to pupils	21	20.0	84	80.0
Check on feedback	9	8.6	96	91. 4

In Table 3, 70 (66.7%) teachers averred that they did not make any attempt to analyse pupils' wrong answers when marking. Also, 77(73.3%) teachers were unable to identify the errors of pupils. Similarly, 79(75.2%) teachers were not able to analyse the errors of pupils. Again, 89(84.4%) teachers were unable to understand the thinking process of pupils in giving wrong answers. The majority (84), which represents 80% of the teachers, did not communicate the error to pupils, and 96(91.4%) teachers failed to check on feedback as to whether pupil understood their errors. It is inferred from the results in Table 3 that more than 60% of the teachers were unable to identify and analyse errors of pupils, as well as communicate feedback on the errors. This result suggests that the majority of the Islamic primary school teachers in the Greater Accra Region of Ghana have inadequate knowledge of error identification and analysis.

Table 4. Chi-square Analysis of the Association between Knowledge of Error Analysis and Analysing Wrong Answer Solution (n = 105)

Test	**df**	**X^2 value**	**p-value**
Pearson Chi-Square	5	17.25	0.10
Likelihood Ratio Chi Square (X^2)	5	19.009	<0.0679

Note. $X2$ test is significant at $p<0.05$ level (2-tailed)

In Table 4, a chi-square (X^2) test of independence was performed to examine the relationship between teacher's knowledge of error analysis and analysing wrong answer solutions.

The X^2 test showed no significant association between knowledge of error analysis and analysing wrong answer solution, X^2 (5, N = 105) = 17.25, p = 0.10. The p-value of 0.10 is more than 0.05 alpha (p=0.10>0.05). Hence, we fail to reject the null hypothesis and conclude that there is no association between knowledge of error analysis and analysing wrong answer solution. Therefore, there is no significant relationship between the two variables.

Discussions

The study found that the majority (71.4%) of the Islamic primary school teachers in the Greater Accra Region of Ghana had difficulty preparing a good marking scheme underlying concepts of a topic for class tests. The marking scheme provides all the important concepts and processes in arriving at an answer. Failure to prepare a good marking scheme implies errors will be committed in providing a solution to wrong answers solution. Marking schemes usually provide a systematic methodology in arriving at an answer, thereby making it easy to identify the source of error or misunderstanding of concepts. The marking of scripts largely depends on the type of marking scheme being used. Again, teachers were not able to use their own marking scheme appropriately. The marking of the scripts was not done according to the marking scheme provided; therefore, it become difficult to identify to analyze the wrong answer solution of pupils. Some teachers have the knowledge to prepare marking scheme, marking of scripts, and analyzing wrong answers solutions but only fail to carry it out because of class size. This agrees with Noraini, who observed that the class size of teachers, if not managed, can affect their concentration in analyzing wrong answers from pupils [21].

It came to light that the majority (78.1%) of the teachers had difficulty in marking class tests of pupils. The results of the study also revealed that teachers who prepared a good marking scheme could not adhere to it in their marking and scoring. Since most of the teachers could not prepare a good marking scheme, they could therefore not score class tests appropriately. The implication is that teachers will be tempted to allot marks indiscriminately. This could lead to a situation where the total marks scored for a question might be more than the marks allotted for the question. Evidence gathered from the study indicated that there is no statistically significant association between knowledge of error analysis and analysing wrong answer solution ($p>0.05$).

Also, findings from this research have shown that, more than 60% of the teachers were unable to identify and analyse errors of pupils as well as communicate feedback on the errors. This result suggests that the teachers have inadequate knowledge of error identification and analysis. In other words, primary school teachers do not have enough knowledge in analysing wrong answer solutions by pupils. This suggests that teachers lack the requisite knowledge in analysing the wrong answer solution of pupils. Most teachers are just interested in marking the final solutions of pupils without systematically analysing the solution methods of pupils. This implies that teachers' extent of knowledge is not enough to appreciate pupils' line of thinking and to identify their sources errors in solving mathematical problems. According to the findings teachers are not able to adequately identify and analyse the errors of pupils, although they have some little knowledge of analysing wrong answer solution. It is probable that the teachers do not have specialized knowledge and pedagogy in mathematics to understand the thinking process of pupils in the methodology in arriving at an answer. This finding validates the view of other researchers [7, 22, 23] who observed that because some teachers lack the technical understanding of concepts they do not even make an attempt to analyse the source of the error or identify the error in their opinion, teachers who attempt to analyse and identify source of error also fail because they do not have adequate knowledge of the Newman's error synthesis model to adequately identify source of error.

Conclusions

The study concludes that the majority (over 60%) of Islamic primary school teachers in the Greater Accra Region of Ghana do not have enough knowledge in analysing mathematical wrong answer solutions of pupils by using Newman's model synthesis. They fail to make an attempt in identify and analyse errors, understand pupils thinking, communicate errors

and check on pupils for corrections or remedies. Based on the findings of this research, it is recommended that mathematics teachers in Ghanaian basic schools should use models Newman's model as a standard method of analysing pupil's work. For this reason, the National Council for Curriculum and Assessment (NaCCA) of the Ministry of Education, Ghana Education Service, Ghanaian universities, colleges of education, and curriculum developers should include Newman's model during the training of mathematics teachers. The introduction of Newman's model synthesis is likely to put teachers in a better position to effectively analyse pupils wrong answer solutions since they do not have any laid down procedure in doing so. Also, Ghanaian basic school mathematics teachers should try to develop students' arithmetic understanding first before advancing to higher levels of story problems. Since wrong answer analysis is beneficial to both teachers and pupils in the teaching and learning process, teachers should be encouraged to integrate it into their teaching process and to also encourage students to be more careful in problem solutions.

Conflict of Interest

The authors have no conflicts of interest to declare.

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The Influence of Media on Voting Behavior in Ghana: The Case in Western North Region

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Abstract

The media have strong impact on Ghanaians' voting decisions. Parties in multiple democracies have since harnessed the use of the media in our political process. The objective of the study was to investigate how the media influence voting behavior in the Western North Region of Ghana. In this study, Purposive and convenience sampling techniques were used. The study adopted qualitative and quantitative research designs. Questionnaires and interview guides were used to collect data. A sample size of 404 respondents was studied. The study revealed that voters in the study area have access to communication devices for obtaining information through political campaigns, advertisements on broadcast, social, print, support, and transit media, which all have a significant impact on voting behavior in the study Region. The study revealed that 65.6% of those polled said the media had a major influence on their voting behavior in the 2020 general elections in the research Region. The study also revealed that party affiliation, party manifesto, current economic conditions, family and friends, and current government performance were other factors that influenced voting behavior in the study area apart from the media. The study, therefore, suggested that the technical infrastructure of the media in the study Region be expanded since voters demand increased and improved access to and usage of the media to get information on political parties' operations in order to shape their voting behavior. Also, media sanity should be strengthened in the study Region.

Keywords*: Elections, Ghana, Media, Voting Behavior, Western North.*

Introduction

Since its independence in 1957, Ghana has undergone a number of democratic elections and military takeovers of civilian regimes, giving rise to the First, Second, Third, and Fourth Republics [1]. Ghana became a constitutional monarchy in 1992, and the Fourth Republic's democratic regime was born. The Country has made significant progress in the establishment of electoral democracy throughout this time [2]. Ghana has had seven presidential and legislative elections in a row since 1992, with three peaceful transitions of power between the incumbent New Patriotic Party (NPP) and the current opposition party, the National Democratic Congress (NDC). The use of emotional appeals in political campaigns to increase or decrease support for a candidate is a widely accepted practice and a typical component of any campaign strategy [3]. Campaigns frequently attempt to instill progressive emotions such as joy and expectation in their electorates in order to boost voter turnout and electoral politicking while also attempting to heighten dread and disquiet about their major rivals. Fear and nervousness disrupt voter behavioral patterns and prompt individual voters to seek first-hand information on various political issues, whereas enthusiasm tends to reinforce predilection for the candidate and party [4]. Traditional media such as television, radio,

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and newspapers, to name a few, are some of the sources of information available to a voter. Nonetheless, due to the widespread use of virtual social media forums, many voters may access online materials, participate in discussions about the information, and express their own thoughts, beliefs, and expectations from the party and candidate. Although the media has aided in the increase in popularity of politicians and their parties to some extent, they also have the capacity to improve or degrade their chances and voters' perceptions of the parties and candidates. Gossips, misinformation, propaganda, and unpleasant language about certain individuals and parties are all too common in the media, and they can spread far faster than expected, frequently with disastrous consequences. This has often been linked to the lack of editorial filtering and the anonymity of most online data [5]. Various parties can also utilize the media to spread false information and propaganda against the opposition in order to discredit that party or candidate in the eyes of the electorate while exonerating their own. This has a significant impact on people's voting behavior, as many voters rely on their decisions on the news they read or hear in the media. Furthermore, because there are no longer any isolated spots or hiding holes, the media has made voters aware of any form of material proof regarding politicians and their lives [6].

The media in Ghana, as in many other African countries, are growing in popularity by the minute. It's worth noting that political usage of social media is widespread and shows no signs of abating. Many political parties worked hard to produce tempting messages and use a range of fresh and unconventional approaches to reach out to a bigger percentage of the populace and solicit their votes during the 2016 Presidential and Parliamentary elections in Ghana. Using media platforms and other social networks to reach out to a bigger community is one of the new approaches to achieving political goals. Social media is crucial to democracy in today's politics. The media has the potential to have a substantial impact on voter choice. The media's role in influencing electoral outcomes, particularly radio and television, has grown in importance [7]. It is against this backdrop that this study sought to investigate how the media influence voter's behavior in the Western North Region of Ghana.

The specific objectives of the study were to establish voters' access and use of media in the Western North Region, to determine how the media influences voter behavior in the Western North Region, and to find out other factors which influence voter behavior in the Western North Region.

The Conceptual and Theoretical Frameworks of the Study

This study was guided by the Sociological Media Framework of Voting Behavior Pattern, which was built by the researchers from some of the structures and sections of the Rational Choice, Sociological, and Two-Step Flow Theories.

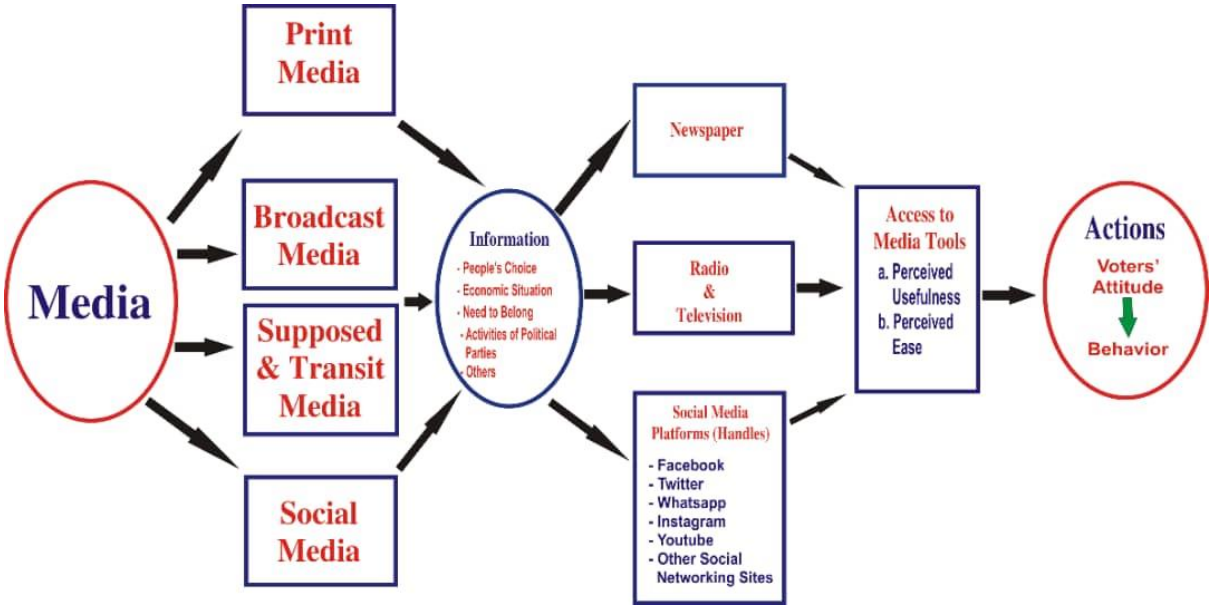

Figure 1. The Sociological Media Framework of Voting Behavior Pattern

Source: Authors' Construct (2021)

The Sociological Media Framework of Voting Behavior Pattern is an amalgamation of the Rational Choice, Sociological, and Two-Step Flow Theories based on some of their proposed and embedded constructs and elements. The framework displays a unique flow of the various media forms and their channels of information dissemination that trigger and accelerate voters' inherent behavioral traits into the actual voting behavior of voters in six stages.

Stage 1: Media

Print media, publishing, news media, photography, film, broadcasting, and digital media are examples of communication channels or technologies and broadly termed as Media. In this construct, information for public consumption (whether credible or misinformation) is carefully planned, designed, and crafted in appropriate forms and channeled through the four outlets (print media, broadcast media, supposed & Transit media, and social media) to their receivers who are compelled to decode them due to the following factors: "the need to belong"; "economic situation"; "people's choice"; and "activities or events currently taking place".

Stage 2: Types (forms) of Media

Print media generally refers to newspapers. Newspapers gather, edit, and publish news and stories. Print media play an important part in every country's development communication. Ghana's government uses print media to ensure the widespread distribution of messages through a variety of newspapers and periodicals. Print media, being a traditional form of communication, plays an important part in the growth. The strengths of Ghana's print media have been primarily formed by the country's past events, particularly its involvement with the independence struggles as well as social emancipation, restructure, and remediation movements. Print media now uses a variety of contemporary and sophisticated technology in both developed and developing nations, and they face severe rivalry from electronic media.

Stage 3: Nature of Information

Information is traditionally thought to be exchanged between people. The argument is that information is present in all-natural systems, including physics, biology, economics, and so on, to the point that these processes may be represented using mathematical models and,

eventually, information processing. The concept of "Nature of Information" is an intellectual concept that does not have a physical manifestation [8]. However, in the context of this research, the "Nature of Information" construct refers to all forms of information disseminated by the media throughout election season that concern "people's decisions", "economic situation", "need to belong", "activities of political parties in the run-up to elections", and "other social factors" that inform voters to make a voting choice.

Stage 4: Medium of Information Dissemination

The method through which facts are disseminated to the general public is known as information dissemination. In today's culture, traditional and social media are the two main ways that people distribute information. Phones, television, oral communication, and print publications are examples of traditional media [9]. In this study, the medium for information dissemination encompasses "Newspaper, Radio, Television, and Social Media Platforms" such as Twitter, Whatsapp, Instagram, Youtube, and other social networking sites. The efficacy of a specific distribution strategy is determined by a variety of elements, including the innovation's features, the target audience, and the communication channel.

Stage 5: Access to Media Tools

In media literacy, access to the tools is defined as how, when, where, and how often individuals have access to the tools, technology, and digital skills necessary to thrive. In this study, perceived usefulness and perceived ease of use of media tools are the two constructs that trigger the acceptability and use of media tools for accessing information.

Perceived Ease of Use of Media Tools

Perceived Ease of Use (PEOU) of a media tool is the extent to which a user of an accessing media tool considers that the use and operation of that tool are less difficult or free from mental effort [10]. The concept of the perceived ease of use accounts for the level where a user of a media tool accepts the fact that the tool being used to access information would not be difficult to manipulate.

Perceived Usefulness of Media Tools

[10] posits that the Perceived Usefulness (PU) of a medial tool is described as the extent to which a user of a media tool trusts that the use of that tool would help obtain more information to enable him or her to decide which side to vote for. The two constructs assume that the use of a media tool to access information on political party manifestos and party activities is driven by behavioral intention. Nonetheless, the behavioral intention is motivated by the user's attitude towards the use of the tool to access information on how to vote in a certain direction.

Stage 6: Actions

The outcomes of the perceived usefulness and perceived ease of use of media tools by a voter trigger the "action" of developing a voting behavior and eventually exhibiting that behavior through vote casting on the day of the election. That is, PEOU and PU lead to the development of voting behavior and the eventual action of the individual to vote in a certain direction.

Methods

Research Design

According to [11], a research design is a precise plan for addressing a research challenge. It is "the plan, structure, and method of investigation designed to get answers to research questions and control variance" [12, 13]. The study looked at how the media influence voting behavior in Ghana's Western North Region using both quantitative and qualitative research designs. Using mixed methods, the researchers were able to look at the research topics from a variety of perspectives, resulting in a more comprehensive understanding of the issues at hand [14].

Profile of the Study Locality (Sefwi Wiawso Municipality of the Western North Region)

The Western North Region was the Region for this study with a focus on the Sefwi Wiawso Municipality. The Sefwi Wiawso Municipality was founded in 1988, and it serves as the administrative center for both the Sefwi-Wiawso Municipal and the Western North Region. Brong Ahafo Region, which is located in the Region's north-eastern corner, borders it on the north. It is bordered on the west by Juaboso and Bia Districts and on the south by Aowin/Suaman. Bibiani-Ahwiaso-Bekwai and Wassa Amenfi border it on the north and south, respectively. The Sefwi Wiawso Municipal Assembly is the Municipality's political and administrative Capital. Sefwi Wiawso is home to the Assembly's offices. According to the 2021 Population and Housing Census, Sefwi Wiawso Municipal had a total population of 151,220 people, with males and females accounting for 50.2 and 49.8% of the population, respectively [15] Similarly, the report estimated the total household population to be 147,162, with 41,513 households. The average household size was found to be 3.5 people [15].

Inclusion Criteria

Persons eighteen (18) years and older who registered and voted in the Sefwi Wiawso Constituency of Ghana's Western North Region in the December 7, 2020 General Elections and agreed to participate in this study were eligible.

Exclusion Criteria

Those who registered but did not vote in the Sefwi Wiawso Constituency during the 2020 General Elections were not included in this study.

Sampling Size, Data Collection, and Data Analysis

Data for this study were gathered through the use of questionnaires and interview guides. Respondents for the study were drawn from the Sefwi Wiawso Municipality. The study population consisted of 65,497 people aged 18 and above who registered and voted in the Sefwi Wiawso Constituency in the December 7, 2020, General Elections. The sample size of 398 respondents was determined using the Yamane Formula.

Yamane Formula, $n = \frac{\boldsymbol{N}}{1+\boldsymbol{N}(e)^2}$

The sample size for the research is ***n*** number of people. Thus, the current voter population surveyed in the Region. ***N*** is the number of voter population in the Region, where ***1*** *is a constant* number, and ***e*** is the margin of error. This formula used 95% confidence level, and P =0.05 are assumed. As a result, the sample size was determined as follows:

$$n = \frac{\boldsymbol{N}}{1 + \boldsymbol{N}(e)^2}$$

Where n=the sample size

N=the population size (65,497)

e=the margin of error (0.05)

therefore,

$$n = \frac{65{,}497}{1 + 65{,}497(0.05)^2} = 398$$

The sample for the questionnaire administration was chosen using a convenience sampling technique. Voters who satisfied the study's requirements were discovered using this method. Voters who agreed to take part in the study were chosen. According to [16], a non-probability sample should be considered if the cost of a probability sample is too expensive in comparison to the type and quality of data collected. The questionnaires were administered to a total of 438 eligible voters. To account for anticipated attrition, this sample was increased by 40 eligible voters (10% of 398). Oversampling, according to [17], reduces the influence of a high attrition rate on statistical analysis while also improving the results' validity. In the end, 404 questionnaires were reclaimed from respondents for the study. The purposive sample method was used to choose 10 eligible voters for the interviews to supplement data generated with the questionnaires. [18] states that sampling should be done with a

purpose in order to acquire qualitative data. Purposive sampling gave the researchers the opportunity to select the appropriate sample that provided the information required. Both the convenience and purposive sampling techniques were used. The questionnaire data was analyzed with Excel and presented in tables, charts, and graphs. For emphasis, the information gathered through interviews was presented in descriptions and direct quotations. Following that, the outcomes were discussed.

Results and Discussions

The respondents' gender, age, religion, education, and marital status were all collected as part of the study. Results of data gathered from the field in respect of the objectives of the study were also presented and discussed here.

Gender Distribution of Respondents

Respondents to the research were summarised by gender groups as presented in Table 1.

Table 1. Gender Distribution

Gender	Frequency	Percent	Valid Percent
Valid Male	297	73.5	73.5
Female	107	26.5	26.5
Total	404	100	100

Source: Field Data (2021)

According to Table 1, 73.5% of respondents were men, and 26.5% were women. This signifies that men made up the majority of the respondents in the survey. This was because the guys were easily accessible and enthusiastically engaged in the survey. According to [19], gender can have an impact on election choice. Men and women may view and interpret electioneering topics in different ways. Furthermore, when it comes to voting, they can assess and prioritize matters differently. As a result, understanding and interpreting electoral outcomes are dependent on gender composition and representation in a study.

Table 2. Ages of the Sampled Respondents

Age	Frequency	Percent	Valid Percent
Valid 18 – 25 years	59	14.6	14.6
26 – 35 years	150	37.1	37.1
36 – 45 years	173	42.8	42.8
46 years and above	22	5.4	5.4
Total	404	100	100

Source: Field Data (2021)

From Table 2, 42.8% of the sampled respondents were between thirty-six (36) and forty-five (45) years old.

Sampled respondents whose age fell between twenty-six (26) and thirty-five (35) years represented 37.1%, while those between eighteen (18) and twenty-five (25) years, as well as those whose age ranged 46 years and above, represented 14.6% and 5.4% correspondingly. According to [20], in the most recent presidential elections, age was one of the biggest predictors of voter choice. As a result, age is a significant factor in shaping voters' opinions on individual subjects. In that regard, different age groups may have different perspectives on topics, and as a result, they will vote differently.

Table 3. Religious Affiliation of Respondents

Religion	Frequency	Percent	Valid Percent
Valid Christianity	362	89.6	89.6
Islam	29	7.2	7.2
Traditional	12	3	3
Other Religion(s)	0	0	0
No Religion	0	0	0
Total	404	100	100

Source: Field Data (2021)

From Table 3, data obtained revealed that the majority (89.6%) of the sampled respondent were Christians, whereas 7.2% and 3% belonged to the Islamic and Traditional religions, respectively, with No Religion constituting zero, as shown in Table 3. This suggests that those respondents affiliated to Christianity made up the majority of respondents in the survey. One's religion also has an influence on the choice of who to vote for in elections.

Table 4. Educational Level of Respondents

Education level	Frequency	Percent	Valid Percent
Valid Primary	0	0	0
JHS	13	3.2	3.2
SHS	123	30.4	30.4
Tertiary	264	65.3	65.3
No Education	4	1	1
Total	404	100	100

Source: Field Data (2021)

From Table 4, it was ascertained that there was no respondent whose level of education truncated at the primary level, but rather 3.2% and 30.4% correspondingly reached Junior High School (JHS) and Senior High School (SHS). The majority (65.3%) of the sampled respondents had attained tertiary education at the time of voting, whereas only 1% (4) of them had no formal education, as shown in table 4. This clearly signifies that the majority of the respondents (65.3%) in the study area have tertiary education qualifications. Respondents, therefore, were knowledgeable enough to understand and provide appropriate data for the study.

In Table 5, it was observed that the majority (51%) of the sampled respondents were single, whereas 44.1% and 4.7% belonged to the married and divorced respectively. According to [21], marriage lessens political engagement among newly married couples because they are still adjusting to married life and are more concerned with issues of their new economic and social circumstances.

Table 5. Marital Status

Marital Status	Frequency	Percent	Valid Percent
Valid Married	148	44.1	44.1
Single	206	51	51
Divorced	19	4.7	4.7
Total	404	100	100

Source: Field Data (2021)

Voters' Access and Use of Media in the Western North Region

Access and Use of Communication Device(s)

The data obtained on voters' access and use of media in the Western North Region is shown in Figure 2.

The study revealed that the sampled respondents, who were primarily resident voters in the study area, have access to communication tools such as smartphones (53.7%), ipads/tablets (36.4%), computers (35.1%), television sets (77.2%), radio sets (55.2%), and information center services (12.9%), and use them to obtain information on voting and other political activities that take place before and during the election. The high patronage of smartphones for accessing the information on electoral matters by a sizeable number (18 to 45 years) of the sampled respondents, who were primarily a younger generation, is an indication that they are technologically savvy. This finding is in line with a study by [10] that the majority (83.7%) of users of technology are found within the age bracket of twenty (20) to forty (40) years since the usage of ICTs and other communication tools is part of their everyday life.

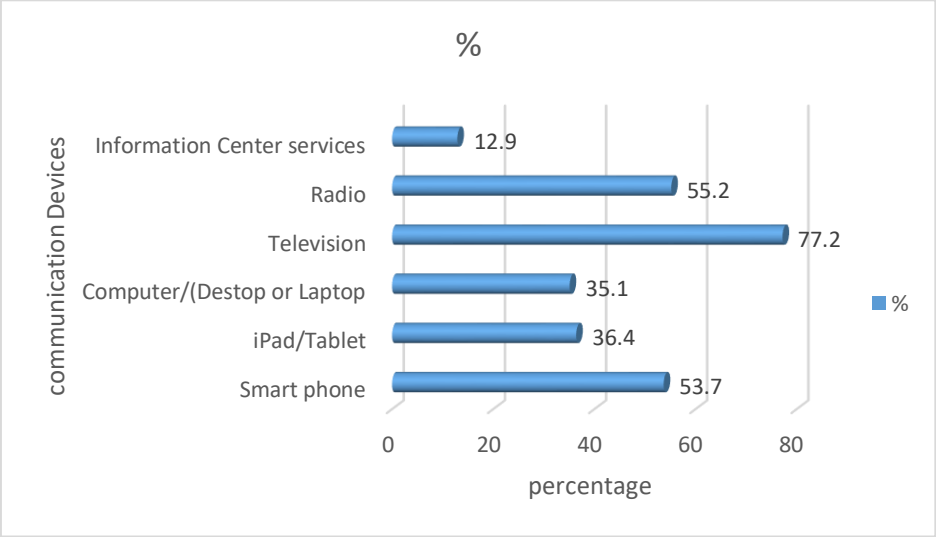

Figure 2. Access and Use of Communication Device(s)

Source: Field Data (2021)

They really use media to access information on political, religious, and other social issues due to widespread ownership and accessibility in their places of abode and at their workplaces. An interviewee remarked, "Yes, we all have access to the media". Yes, we use it because there are media tools in almost every home and workplace.

(Participant "D": A 24-year-old female voter in the Wiawso Constituency:

Yes, we have radio stations, and so we have access to the media. Somehow, we listen to the radio stations, so I can say that we use them in the Western North region (Interview, 2021).

These findings are consistent with findings by [22] that the majority of voters utilize the media in their daily lives since it is a source of political knowledge and information for them.

Number of Years of Use of Communication Device(s)

This aspect of the study sought to establish the number of years the sampled respondents have used communication tools. Figure 3 contains information on the respondents' years of experience using communication technologies.

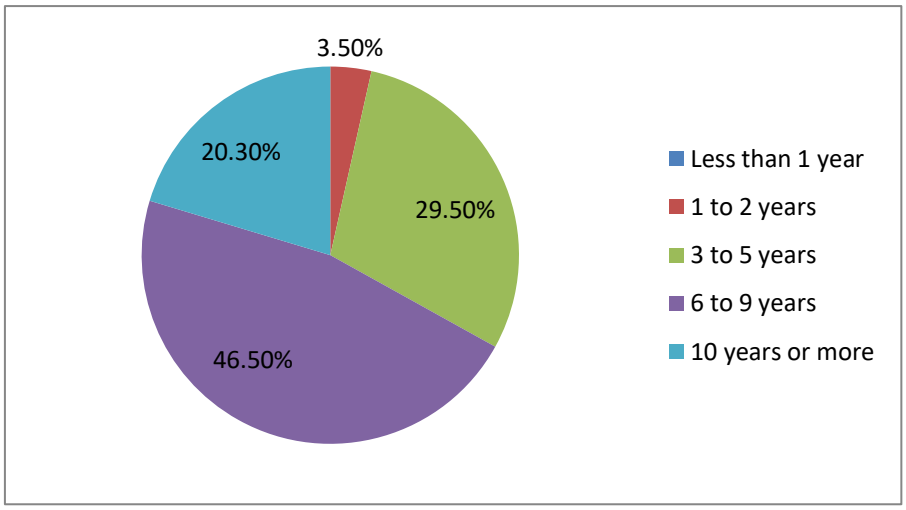

Figure 3. Years of Use of Communication Device(s)

Source: Field Data (2021)

Data shown in Figure 3 indicated that 46.5% of the respondents had used communication tools for a period of 6 to 9 years. In addition, 29.5% of respondents clearly indicated that they had used communication tools for 3 to 5 years, while 20.3%; and 3.5% had used them for 10 years or more; and 1 to 2 years, respectively. This was a clear indication that the majority (66.8%) of the sample respondents in the study area have used communication tools for a long period, spanning over at least two elections.

A respondent in the interview stated that: *Yes, they do because they are the ones who own them. Yes, since practically all of them use their mobile phones to listen to the radio, watch television, and read political news* (Interview, 2021).

Forms of Media Frequently Used by Voters

The aim of the study here was to determine the forms of media frequently used by voters in the study area. The results from the data collected are displayed in Figure 4.

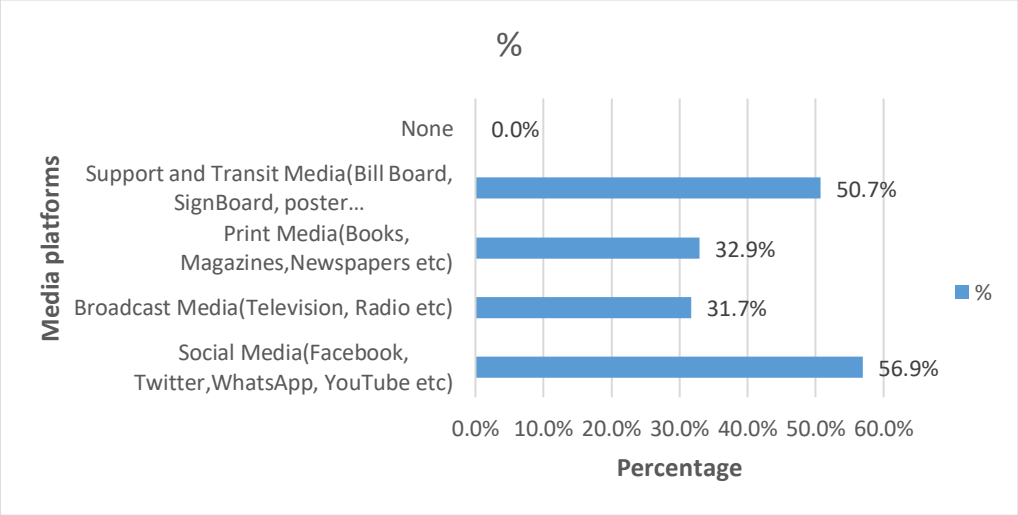

Figure 4. Media Platform(s) used by Voters

Source: Field Data (2021)

According to the data in Figure 4, 56.9 % of the sampled respondents use social media to obtain information on election-related matters, while 43.1% do not; 31.7% obtain information on election-related matters through broadcast media (television and radio), while 68.3% do not; 32.9% obtain information on election-related matters through print media (books, magazines, newspapers, etc.), while 67.1% do not; and 50.7% obtain information on election-related matters through support and transit media (billboards, signboards, posters, information centres, etc.), whereas 49.3% do not. The increased access and use of communication devices among the voting populace within the study area was attributed to the widespread of social communication on media platforms such as *WhatsApp*, *Imo, Viber, Facebook, Twitter, television, radio, newspaper, books, magazines, billboards, posters* and the likes in the Ghanaian society [10], and their appreciable high level of education.

Media Influence on Voter Behavior in the Western North Region

How Media Campaign Messages Influenced Voters' Voting Behavior During the 2020 Elections?

Figure 5 depicts the data acquired from the study, which is intended to determine the extent to which media campaign messaging influenced people's voting behavior during the 2020 elections.

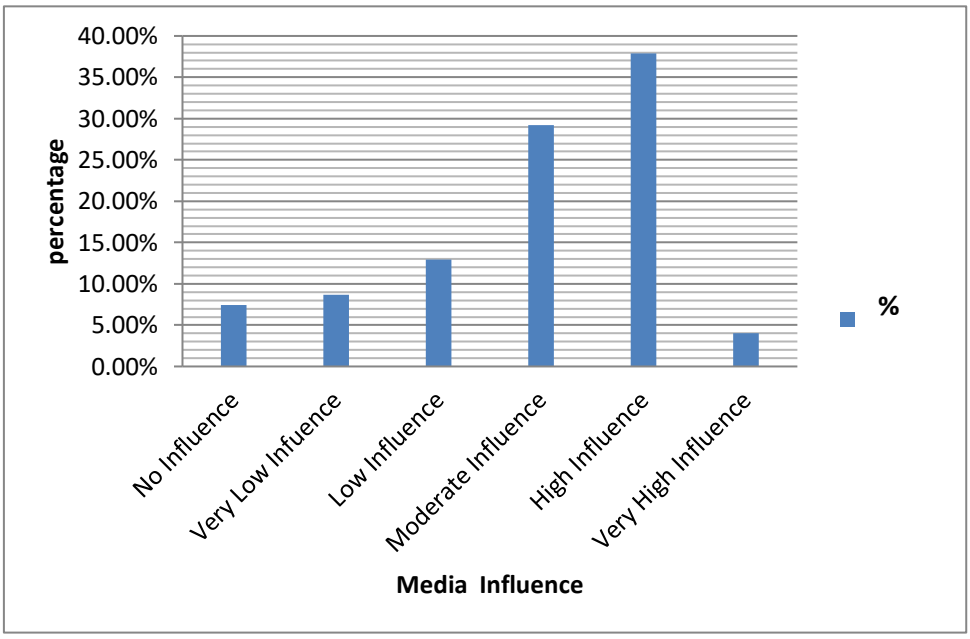

Figure 5. The Extend at which Media Campaign Messages influenced Voters' voting behavior during the 2020 Elections

Source: Field Data (2021)

The study found that 37.9% of voters said media campaign messages highly influenced their voting behavior in Ghana's 2020 general elections, while 4%, 29.2%, 12.9%, and 8.7% said media campaign messages had a very high, moderate, low, or very low influence on voters' voting behavior in the 2020 elections, respectively. With respect to high the influence of media campaign messages on voters' voting behavior during the 2020 elections, political ads on social media highly influence the voting behavior of voters during elections [23-25]. In discussing how the media influence voter behavior in the Western North Region, the participants of the study area identified a number of issues such as political campaigns, music, and advertisements that run on broadcast, print, social media, support and transit media, and

politician ownership of media outlets. Also mentioned was the hosting of political programs on radios that are listened to by the majority of people for information on current issues in their constituency. Similar findings were reported by [26] that campaigns, politicians, and public discourse have all benefited from political advertising in the media, which has influenced voters to act in ways that benefit political parties. She further observed that the vehicles for political campaigns and sloganeering had been newspapers, direct mail, radio, and television that influence voter behavior in the lead-up to national elections.

Another interviewee recounted that:

the hosting of political programs on radios that are then listened to by the majority of people for information on current issues in their constituency.

Also goes to establish how the media influence voting behavior in the study area. (Interview 2021).

Overall Media Influence on Respondents' Voting Decisions in the Western North Region

The study sought to establish the overall media influence on respondents' voting decisions in the study area. Figure 6. Shows data obtained on the overall media influence on respondents' voting decisions.

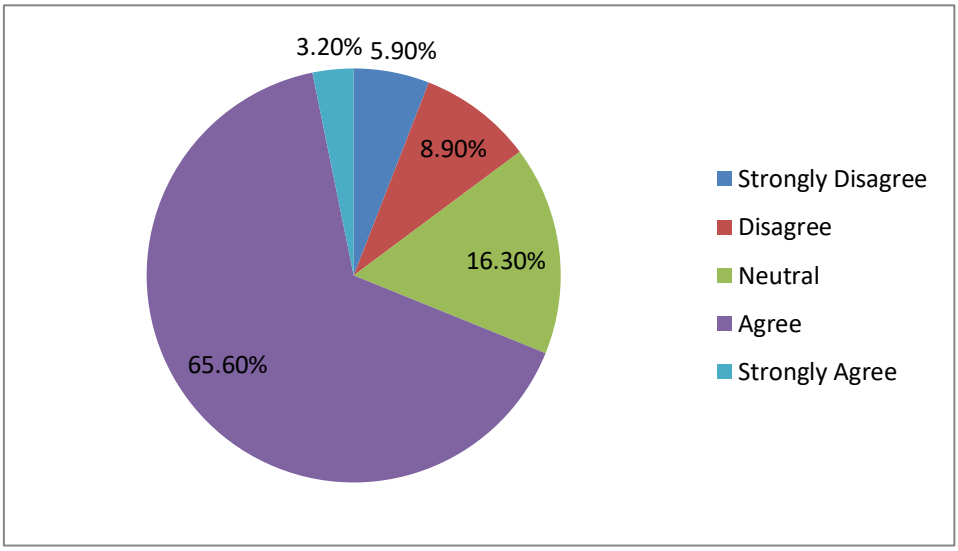

Figure 6. Overall Media Influence on Respondents' Voting Decisions

Source: Field Data (2021)

From Figure 6, The study revealed that the majority of the studied respondents (65.6) agreed that the media have a valuable influence on voters' voting decisions in the study area, while 3.2% strongly agreed, 8.9% disagreed, and 5.9% were undecided. Up to 16.3% of the respondents said they were undecided. The findings in this regard were similar to the work of [27] who stated that the media have a favorable impact on the decision-making process when it comes to the voting intentions of respondents. Also, the media play a major role in the decision-making process and the voting intentions of the voter. This finding is also anchored in a study by [28], who contended that the popularisation of social media had acquainted billions of voters to vote directly on issues.

Other Factors that Influence Voter Behavior in the Western North Region

Apart from the media, the study wanted to find out what other variables impact voter behavior during elections. The sampled respondents presented the following as other factors influencing voter behavior during elections that are not related to the media.

Table 6. Other Factors that Influence Voter Behavior during Elections apart from the Media

Item	Frequency	%
Party affiliation	49	12
Development projects	41	10
Party manifesto (policies and programs)	36	9
The personality of the candidates	69	17
Prevailing economic situations	15	4
Family and friends (close relations)	8	2
Performance of the government of the day	12	3
House to House campaign by candidates	24	6
Position on specific issues by voters	12	3
Political rallies	24	6
Ethnic consideration	16	4
Cocoa pricing	4	1
Party sloganeering	58	14
Employment policies	24	6
Participation in social functions (e.g. funerals, weddings and naming ceremonies)	8	2
Religious inclinations of people	4	1
Total	**404**	**100**

Source: Field Data (2021)

These observations are in line with a similar study conducted by [29], who indicated that among voters, knowing local candidates, concern about local policy issues, among others things such as affiliation with a political party; development initiatives; and the party manifesto (policies and plans); candidates' personalities; economic conditions that are now in effect; close relatives and family members; the current government's performance; ethnic inclinations; prices of commodities; the style of the campaign propaganda for a political party; policies affecting employment; participation in social events (for example, funerals); and people's religious preferences are the main factors influencing voter behavior during elections. This data implies that the majority of voters are evaluative voters, who analyze the qualifications of candidates before casting their ballots. The relevance of candidate personality as a determinant of vote choice in the study area is supported by [30], who claimed that Jerry John Rawlings won the 1992 and 1996 Ghana elections largely due to his personality, charisma, and leadership traits; thus, the defeat of the NDC in the 2000 elections was caused by Rawlings' absence as a candidate [30, 31].

Other case studies from around the world also show that personality has a role in political conduct. [32] studied Italian national voters; [33] studied South Korea; [34] studied the Netherlands; [35] studied Germany; and [36, 37] studied the United States. Despite the fact that all of these studies show that personality influences political conduct, the extent to which candidates personality influences political attitudes and behaviors differs greatly from place to place, implying that context is crucial [33].

The findings were similar to those of [38-39] who both claimed that the NPP's election 2000 slogan, "Hwe Wo Asetena Mu, Na To Aba Pa," which translates to "Examine Your Life and Vote Accordingly," was appealing and thus successful in persuading voters to vote for the party into power in the 2000 election. Similarly, the NDC's motto "Better Ghana Agenda" and

pledges like "employment for everybody" and "one-time premium payment of national health insurance" were essential in the party's election victory in 2008. Furthermore, education was a major campaign issue in the 2016 elections. While the ruling NDC campaigned on expanding educational access through infrastructure development, the NPP offered free senior high school education if they were elected. The NPP's campaign promises of restoring teacher and nursing training allowances, one-district one-factory, one-village one-dam, and one-constituency one-million dollars for projects, in addition to its flagship free senior high school policy, are thought to have contributed to the party's victory in the 2016 Presidential and Parliamentary Elections. The NPP was effective in communicating a message of hope to the electorate, whilst the incumbent NDC campaigned solely on the achievements of their infrastructure. The electorate responded positively to the opposition NPP's campaign theme, and they were elected to power. As a result, the study claims that campaign efforts in Ghana influence voting behavior. These data support Popkin's theory that campaign pledges are important factors in elections.

In most circumstances, voters will look to election campaigns for information on parties, candidates, and policy positions [40-42] both affirm the relevance of the campaign factor, claiming that campaign messaging assists the electorate (mainly unaligned voters) in determining which party and candidate is better prepared to handle their difficulties and expectations. [43] also provides evidence that election campaigns have a significant impact in a variety of ways. Furthermore, this study, as well as studies by [44], demonstrate that campaign pledges do contribute to electoral victory in Ghana, despite the fact that other factors influence voter behavior.

Interestingly, [45] in his study on "How Do Voters Decide," found that ethnic and economic factors have little impact on voting behavior in Ghana: they have no impact on how the bulk of the population casts their ballots. This outcome contradicts the popular perception of Ghana's elections, which holds that they are merely an ethnic census. Furthermore, the findings imply that the majority of Ghanaians are evaluative voters, who base their voting preferences on a rigorous assessment of competing candidates' competency and campaign promises. Essentially, this study emphasizes the importance of personality and pragmatic policy in winning elections. As a result, politicians must consider public perceptions of their trustworthiness and image, as well as the policies they offer to the campaign platform.

Non-Media Factors have More Influence on Voter Behavior than That of the Media

The study sought to establish how non-media factors have more influence on voter behavior than that of the media, if at all and the data in Figure 7 shows the way and manner these other factors influence voting behavior more than that of the media.

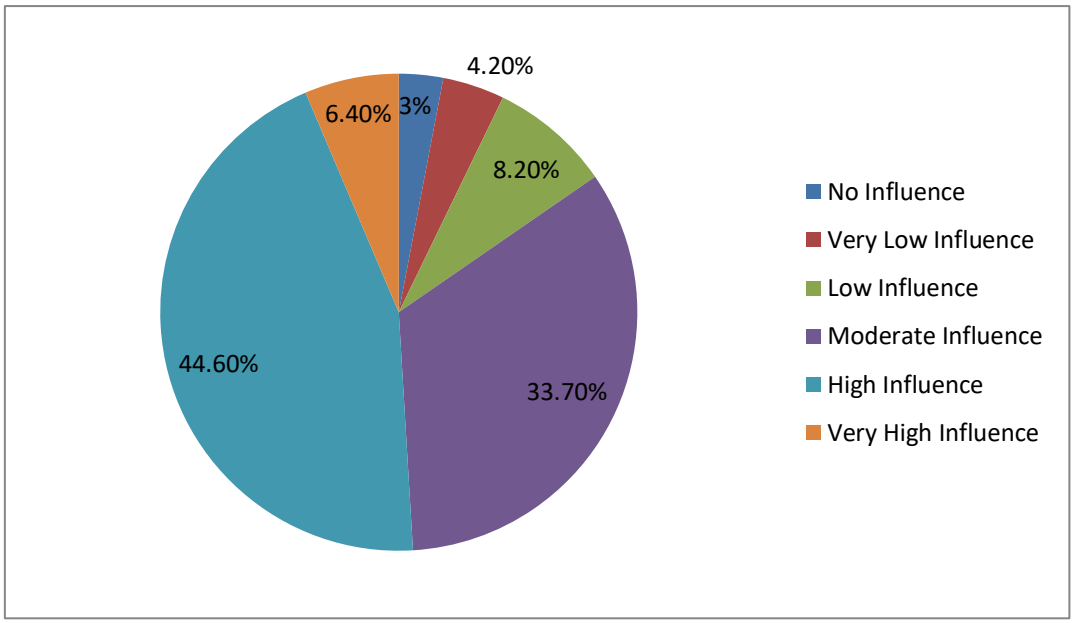

Figure 7. The Way and Manner Non-media Factors have more Influence on Voter Behavior than that of the Media

Source: Field Data (2021)

From Figure 7, it was observed that there is a high level of influence (44.6%) and a moderate level of influence (33.7%) of non-media factors on voting behavior than that of the media, compared to very high influence (6.4%), low influence (8.2%), and very low influence (4.2%). Respondents who believed that there was no influence constituted 3%. This finding can be likened to similar findings by [46] who indicated that in Ghana, the campaign message and the presidential candidate's ethnicity have a significant impact on voter choice. More importantly, patronage politics and thematic programs are more important than media in influencing voting behavior during elections (ibid). This finding is also consistent with [47] finding that when voters base their decision on the policy and economic preferences that underpin a preferred ideology, their voting behavior is heavily influenced. Conversely, [48] found, based on the 2005 Round three (3) Afrobarometer survey of seven African nations, that while ethnic relationships influence vote choice in Africa, retroactive appraisals (evaluative voting) of economic achievement are also significant. Contrary to the findings of this study regarding development projects and the performance of government, the ability of politicians or governments to give private and public goods to their citizens is not tied to voters' evaluative behavior but rather to the actual or predicted performance of the candidates [49].

Drawing on the finding from other factors that influence voter behavior in the Western North Region, the responses from the participants of the study indicated that they are driven by political party policy proposals, house-to-house campaigning during elections, money, and gifts, music, and commercials that run on broadcast, print, social media, and support, as well as support and transit media, which I believe influence voting behavior in the Region.

Personally, I base it on the policy proposal from the competing political parties in a particular year's election. Based on that, I see the difference between the ones that are good to me. I go with those ones and vote accordingly.

(Participant "A": A 34-year-old male voter in the Wiawso Constituency).

This finding is supported by [50], who state that voter responses to election pledges are

compared to voter responses to political party activities in the past.

The participants also recounted that:

money and gifts influence people's voting decisions and choices before and during elections all.

(Participant "I": A 30-year-old male voter in the Wiawso Constituency).

I can say money. Politicians use the money to influence voters to change their minds to vote on their behalf. So, money is another factor.

(Participant "C": A 37-year-old male voter in the Wiawso Constituency).

This finding is consistent with an observation by [51] which opined that the provision of cash or other tangible goods by political elites to voters might have a significant impact on people's voting decisions.

Other responses elicited from the interview showed that:

Apart from the media, people will go for house-to-house campaigns during election time to convince people to vote for them on election day.

(Participant "B": A 27-year-old male voter in the Wiawso Constituency).

This is evident in a study by [52], who state that because most politicians do not operate in a free atmosphere, they must rely on a house-to house campaign approach to persuade voters to vote for them.

Conclusions and Recommendations

The study investigated the influence of media on voting behavior in the Western North Region of Ghana. The study found that residents in the area have access to communication tools such as smartphones because of the cosmopolitan nature of the area and the availability of adequate technological infrastructure. Consequently, they use them to obtain information on voting and other political activities that take place before and during elections, and it has become part of their daily lives. Voting behavior is influenced by political campaigns, music, and advertisements on broadcast, print, and social media, according to the study. Findings showed that 65.6 % of those polled said the media had a major impact on their voting behavior in the 2020 general elections in the research Region. Apart from the media, the main other factors that influence voting behavior are party affiliation, development projects, party manifesto, current economic conditions, family and friends, current government performance, political rallies, ethnic leanings, cocoa prices, money, and gifts, party sloganeering, and employment conditions.

Voters require increased and improved access to and usage of the media to get knowledge of political parties' religious, social, and educational policies in order to develop their voting behavior, therefore, the technical infrastructure of the media in the research Region should be expanded. Also, Media sanity should be strengthened in the study Region to create a conducive political environment for voters in quest of accessing electoral information towards elections through the broadcast, print, social, support and transits media.

Acknowledgements

We are thankful to all those who assisted us to come up with this paper.

Conflict of Interest

In this study, there is no conflict of interest.

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An Assessment of Healthcare Relationship Trust between Patent Medicine Vendors and Residents of Hard-to-Reach Settlements in Northern Nigeria

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Abstract

A trusting relationship is required for effective communication between care providers and care seekers, and trust is a determinant of early healthcare-seeking and care outcomes. The patient-Doctor healthcare trust relationship has been widely studied in different settings. However, there is a dearth of information on whether the factors underlying healthcare relationship trust between patients and their doctors are the same as those underlying patients' trust in other healthcare professionals (including the PPMVs). This study, therefore, aims to assess the level and determinants of healthcare relationship trust between patent medicine vendors and their clients in hard-to-reach settlements in North-western Nigeria.

We adapted the revised healthcare relationship trust scale, administered by trained data collectors using android devices. The data were analysed using Stata (version 16). We used the Chi-square test to identify the correlates of the level of trust(high/low), and binary logistic regression was used to identify its determinants. Statistical significance was defined as P<0.05.

Slightly above one-quarter (28.1%) of the underserved had high healthcare relationship trust in the PPMVs. Being married, male, residing in a rented or makeshift shelter in Kaduna state, with under-five child(ren) in their household, and self-reporting good health predicted a high level of healthcare relationship trust in PPMVs among the underserved who participated in this study. We concluded that the personal and household characteristics of the underserved could significantly influence their level of trust in PPMV. Therefore, to achieve the aim of improving health outcomes in deprived populations, initiatives seeking to integrate PPMVs into the formal health system in resource-constrained settings should seek to address the determinants of healthcare relationship trust in these populations as part of their rollout process.

Keywords: *Communities, Hard-to-reach, Healthcare, Trust, Relationship, Workforce.*

Introduction

The health workforce is an integral part of the health system and plays a major role in achieving quality delivery of healthcare services. The World Health Organization (WHO) defines health workforce as people that are "primarily engaged in action with the intent of enhancing health" involved in diagnosing illnesses, providing care for people, involved in monitoring health outcomes, supporting adherence to treatment, providing medical information, and preventing diseases [1, 2]. They include physicians, nurses, midwives,

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dentists, pharmacists, and pharmacists' technicians, laboratory staff, environment, and public health workers, community health workers, other health workers, health management, and support staff [3].

The national health systems across many low and middle-income countries (LMICs) have sub-optimal performance due to ongoing challenges within the health sector, with this particularly affecting the delivery of accessible healthcare services [4]. The publicly owned health facilities and private hospitals are the most prominent structures within most national health systems, with other non-state actors rarely recognized [5]. The health systems in these settings have limited capacity to recognize and maximizing the efforts of all parastatals that are primarily devoted to improving health [1, 4].

There have been popular calls for all forms of efforts towards strengthening health systems across sub-Saharan Africa (SSA) [6], but human resources for health challenges in these climes-have persisted.[7] There are only a few well-equipped and appropriately staffed government-run primary, secondary, and tertiary health facilities in Nigeria to meet population-wide health needs [1, 8]. Several studies have earlier reported an association between the availability of health workforce and health outcomes [4, 9]. Recent health indices in Nigeria signpost the weak capacity of the health system- the estimated infant mortality rate at 67 per 1000 live births; under-five mortality rate at 132 per 1000 live births; maternal mortality ratio at 512 per100 000 live births; and average life expectancy at 55 years [10, 11]. Maternal and child health indicators in northern Nigeria continue to be among the poorest in the world [12].

The prevalent social inequalities in the health sector across the socioeconomic classes in developing countries remain concerning [13, 14]. These inequalities contribute significantly to poor health outcomes [15, 16]. A large proportion of the deaths occur in rural communities where about 69–70% of the population lives [17]. The high mortality rates in Northern Nigeria have been associated with health system gaps, socioeconomic factors, and cultural norms regarding obstetric-related practices [18].

As Nigeria continues to pursue the Universal Health Coverage (UHC) goals and make healthcare more accessible, existing data has shown that the role of PPMVs has become more important [19, 20], although not always recognized as front-line health workers in Nigeria and other sub-Saharan countries. Medicine shops often serve as an alternative source of healthcare in settings where there are healthcare system gaps (including human resource shortage) and are usually the closes care options in most communities [19-23]. Findings from a recent study by Daini and colleagues showed that the distribution of PPMV shops in the southern and northern parts of Nigeria is far above twice that of the most populous health facilities; ranking 32 and 46 per 100,000, respectively, in Lagos (from Southern Nigeria) and Kaduna (from Northern Nigeria), and have continued to grow progressively in recent years compared to other traditional health facilities, thereby becoming the most accessible health facility for potential clients for different healthcare services [20]. Physical access is one of the domains of UHC, and it's dependent on the proximity of health facilities to potential clients [24]. Studies have also shown the increase in the spread of PPMVs has major implications, especially in Rural areas [23-26]. With some recent studies in Nigeria revealing the emergence of PPMVs who report having undergone formal medical training [19, 20, 22, 27], there is a shift from the previous consensus about the general definition of medicine vendors, who were only characterized as being able to read and write [23], having completed mainly primary education and not having formal training in medicine and pharmacy [28].

The scenario of the increasing numbers and relevance of PPMVs and the gap in the health workforce, in addition to some scoping analysis

by the federal government of Nigeria, has led to Nigeria embarking on the task-shifting and task-sharing (TSTS) policy which, among other roles aims to fill the prevailing health workforce gap (especially for essential healthcare services across the country) through the utilization and expansion of services to personnel at the community-level (such as PPMVs) [29-30]. Services currently being considered by the federal government include the provision of treatment services, counselling, and referrals for key Maternal, Newborn, and Child Health services (including FP) [30].

While task sharing and shifting is usual within the public sector [31-33], there is limited evidence of the practice being extended to key community healthcare workers (chiefly PPMVs and CPs), which has been shown to have potentials to provide basic healthcare services and have increased contact with the population, especially within the rural areas [34]. Between 2017 and 2021, the FMOH, supported by Bill and Melinda gates, piloted a three-tiered accreditation system for PPMVs; under the pilot, PPMVs were divided into three distinct groups based on their healthcare qualifications and further supported to provide FP services in southern and northern Nigeria [35]. There is a popular conjecture that the integration of PPMV into the public healthcare system could improve access to high-quality primary healthcare services [19]. However, the processes and considerations involved in seeking and obtaining healthcare is complex and never straightforward [36-39].

Thom and colleagues [40] emphasized the connotation of the perceived or expected behaviour of healthcare providers in their definition of trust. Another Author [41] added the dimension that trust also encompasses an expectation of future actions in favor of care seekers.

A trusting relationship is required for effective communication between care providers and care seekers [42]. Trust is a determinant of early healthcare-seeking [41-44], adherence to treatment [45], and return to follow-up and continuity of care [46-52]. Carr asserted in 2001 [53] that trust in healthcare professionals is a complex process that evolves, and it's based on mutual intention, reciprocity, and expectations. [54] established that healthcare trust is a strong determinant of treatment outcomes.

However, Bova and Colleagues [55] emphasize the lack of clarity on whether the factors underlying healthcare relationship trust between patients and their doctors are the same as those underlying patients' trust in other healthcare professionals (including the PPMVs). Our literature search did not find any study on the healthcare relationship trust between patent medicine vendors and their clients in Nigeria or even elsewhere in Africa. This study, therefore, aims to assess the level and determinants of healthcare relationship trust between patent medicine vendors and their clients in hard-to-reach settlements in North-western Nigeria.

Materials and Methods

Study Design

A descriptive cross-sectional study of residents of hard-to-reach communities selected from 2 states selected in the north-western geopolitical zone of Nigeria. Kaduna and Jigawa states were randomly selected from a total of 7 states in the geopolitical zone. The zone predominantly houses the Hausa, Fulani, and Kanuri tribes. The region is largely rural and agrarian in feature and makes up about 15% of the entire population of Nigeria [56].

Sample Size

The sample size for the study, which comprised heads of households in hard-to-reach settlements, was calculated using the formula in the equation below:

Minimum sample size (per State),

$n = D_{eff} * \frac{Z^2 P(1-P)}{d^2}$ = 318 head of households ----- equation 1

Where:

Z= Z-score corresponding to the level of statistical significance desired (0.05) = 1.96.

P= Proportion of rural dwellers diagnosed with their ailment by medically trained PPMV= 0.078 [22].

d = *Desired level of precision= 0.05.*

D_{eff} *= Design effect= 2.5.*

Sampling Method

Multi-stage sampling approach was employed in selecting the 665 heads of households who participated in the study. From 2 randomly selected states in the Northwest region (Kaduna and Jigawa), We ranked the LGAs in each of the two selected states (using the list of communities designated as hard to reach by the Local health authorities) in descending order of the concentration of hard-to-reach settlements they contained. The top 30% (3LGA in Kaduna and 5 in Jigawa) were purposively selected. We then selected 40 hard-to-reach communities (20 per State) using a systematic random sampling method with the probability of selection proportional to the relative presence of the underserved. Households were after that selected from the 20 sampled communities using systematic random sampling with probability proportional to the relative size of the population of the already selected settlements. The final selection of individual households in selected communities involved a systematic random sampling approach after household listing and determination.

Data Collection Tool and Procedure

Trained data collectors utilized a semi-structured questionnaire that was digitized on the *KOBO toolbox* (an open-source data collection platform) and preloaded on android phone devices to obtain data from the selected heads of household. The questionnaire included items on the personal and household characteristics of the respondents and adapted the revised Healthcare relationship trust scale [55] and the Health Perception questionnaire [57-58]. We analyzed the data with Stata (version 16).

Data Analysis

The primary outcome of this study was Healthcare relationship trust between the underserved in hard-to-reach communities and the PPMV. We computed overall trust scores as prescribed by Bova's and colleagues [55]. For ease of interpretation, the overall trust scores were dichotomized (into high and low trust) using the procedure recommended by Barua and Colleagues [59]. We explored the relationship between the personal and household characteristics and the three sub-scales sores of healthcare relationship trust (Interpersonal connection, respectful communication, and professional partnering) using independent sample t-test and one-way ANOVA. We also used the Chi-square test to investigate the association between level of trust(high/low) and the respondent's characteristics (personal, household), as well as the perceived health status reported by the residents of hard-to-reach settlements. Binary logistic regression was used to identify the determinants of healthcare relationship trust between the PPMVs and the residents of hard-to-reach communities. Statistical significance was defined as $P<0.05$. The ethics review committee of the state ministry of health of Kaduna and Jigawa states approved the protocol for the study.

Results

Description of Healthcare Trust Relationship between Residents of underserved Communities and Patent Medicine Vendors

The healthcare relationship trust scale measured the level of trust a participant has in patent medicine vendors. Out of the maximum of 65 scores, the total mean score among the participants was 42.17(±8.91), with a minimum score of 11 and a maximum score of 52 (Table 1). The higher the trust score, the higher the trust the participants have in the patent medicine

vendors [55]. The participants in Jigawa had a slightly higher trust in patent medicine vendors (42.91±10.75) compared to 41.40±6.38 among those in Kaduna state.

Table 1. Description of Respondents' Healthcare Trust Relationship Score by the State of Residence

Variable	Mean (SD)	Median (IQR)	Min, Max
Kaduna			
Interpersonal connection	22.44 (3.75)	23 (20 - 25)	11, 29
Respectful communication	18.96 (3.09)	19 (17 -21)	10, 25
Professional partnering	6.16 (1.28)	6 (5-7)	3, 10
Overall trust score	41.40 (6.38)	42 (38 -46)	21, 54
Jigawa			
Interpersonal connection	23.06 (5.89)	24 (20-27)	6, 30
Respectful communication	19.84 (5.01)	20 (18-24)	5, 25
Professional partnering	6.97 (1.35)	6 (6-8)	3, 10
Overall trust score	42.91 (10.75)	44 (39-51)	11, 55
Total			
Interpersonal connection	22 (4.97)	24 (20-26)	6, 30
Respectful communication	19.41 (4.20)	20 (18-22)	5, 25
Professional partnering	6.57 (1.38)	6 (6-7)	3, 10
Overall trust score	42.17 (8.91)	43 (38-48)	11, 55

Correlates of Healthcare Trust Relationship Constructs

Table 2 revealed that State of residence, religion, and tribe are statistically associated with the interpersonal connection between the underserved and patent medicine vendors. We also found that the State of residence, age, and sex of household heads, religion, tribe, and marital status are correlated with respectful communication between PPMV and the underserved. Professional partnering, on the other hand, is associated with the State of residence, religion, and tribe of the underserved.

Table 2. Relationship between HCR subscales and Respondents Characteristics

	Interpersonal Connection		**Respectful Communication**		**Professional Partnering**		
Characteristics	Mean Score	T/F stat (P-value)	Mean Score	T/F stat (P-value)	Mean Score	T/F stat (P-value)	**Total (N)**
State							
Kaduna	17.59	3.1045	27.45	2.6474	16.70	7.318	326
Jigawa	16.89	(0.0020)*	26.43	(0.007)*	18.71	(<0.01)*	339
Age-group							
<25	16.43		24.96		17.67		51
25-34	17.33		27.09		18.05		169
35-44	17.16	1.580	26.69	2.530	17.53	0.730	207
45-54	17.64		27.66		17.87		137
55-64	17.23		27.37		17.71		59
65+	16.76	(0.1635)	26.88	(0.028)*	17.02	(0.600)	42
Sex							

Male	17.26	0.6357	27.15	2.3968	17.63	1.3737	541
Female	17.08	(0.5250)	26.98	(0.0168)*	18.13	(0.170)	124
Education							
None	17.09		26.96		17.55		47
Quranic	16.98	1.9400	26.53	1.670	17.76	0.2500	366
Primary	17.62		27.59		17.44		98
Secondary	17.53		27.60		17.89		126
Tertiary	18.00	(0.101)	26.86	(0.1561)	17.82	(0.909)	28
Religion							
Christianity	16.66	2.730	25.38	2.6921	14.71	7.2281	65
Islam	17.29	(<0.001)*	27.10	(0.007)*	18.01	(<0.01)*	600
Tribe							
Hausa	17.72		27.92		18.14		341
Fulani	16.65	6.770	25.46	12.270	17.27	25.910	165
Kanuri	16.84		27.03		19.43		86
Others	16.73	(<0.001)*	25.51	(<0.001)*	14.84	(<0.001)*	73
Marital status							
Married	17.28	1.9324	27.02	4.770	17.74	0.4372	632
Single	16.27	(0.053)	25.12	(0.0294)*	17.45	(0.662)	33

Table 3 also revealed that some household characteristics are statistically associated with healthcare relationship constructs. Household size, type of household abode, presence of child(ren) under 5 in the household, and household health insurance status are associated with interpersonal communication. Respectful communication between PPMV and the underserved is associated with household size and health insurance status of the household, while professional partnering is only associated with health insurance status.

Table 3. Association between Household Characteristics and 'Healthcare Trust Relationship

	Interpersonal Communication		**Respectful Communication**		**Professional Partnering**		
Characteristics	Mean Score	T/F stat (P-value)	Mean Score	T/F stat (P-value)	Mean Score	T/F stat (P-value)	**Total(N)**
Number in household							
1-10	16.97	4.250	26.42	4.980	17.54	1.800	377
11-20	17.47		27.53		18.09		239
21+	18.06	(0.014)*	27.96	(0.007)*	17.45	(0.166)	49
Type of abode							
Permanent	17.14	3.130	26.82	2.520	17.69	0.350	602
Semi-perm(rented)	18.20		28.42		18.08		49
Temporary	17.64	(0.044)*	26.42	(0.081)	18.14	(0.706)	14
Pregnant women in HH							
Yes	17.30	0.1625	27.08	0.3151	18.01	1.632	291
No	17.26	(0.871)	26.96	(0.752)	17.54	(0.103)	354
Child Under-5 Member							
Yes	17.29	2.1169	27.01	1.5392	17.78	1.366	618

No	16.36	(0.034)*	25.87	(0.124)	17.02	(0.172)	47
Health insurance Cover							
Yes	18.27	4.3055	28.69	4.3641	18.67	3.084	118
No	17.00	(<0.01)*	26.55	(<0.01)*	17.72	(0.002)*	547

Table 4 shows 71.9% of the underserved had low trust in the PPMVs. The level of trust was statistically associated with the State of residence, sex of respondents, religion, tribe, marital status, type of residence, and presence of a child under 5.

Table 4. Association between Respondents' Characteristics and 'Healthcare Trust Relationship between underserved and PPMVs

	Overall trust				
	Low trust	**High trust**			
Characteristics	Frequency [n (%)]	Frequency [n (%)]	**Total**	**χ2-value**	**P-value**
State					
Kaduna	267(81.9)	59(18.1)	326		
Jigawa	211(62.2)	128(37.8)	339	31.779	0.000*
Age-group					
<25	39(76.5)	12(23.5)	51		
25-34	121(71.6)	48(28.4)	169		
35-44	149(72.0)	58(28.0)	207		
45-54	96(70.1)	41(29.9)	137		
55-64	45(76.3)	14(23.7)	59		
65+	28(66.7)	14(33.3)	42	1.888	0.864
Sex					
Male	369(68.2)	172(31.8)	541		
Female	109(87.9)	15(12.1)	124	19.361	0.000*
Education					
None	32(68.1)	15(31.9)	47		
Quranic	258(70.5)	108(29.5)	366		
Primary	74(75.5)	24(24.5)	98		
Secondary	93(73.8)	33(26.2)	126		
Tertiary	21(75.0)	7(25.0)	28	1.689	0.783
Religion					
Christianity	63(96.9)	2(3.1)	65		
Islam	415(69.2)	185(30.8)	600	22.353	0.000*
Tribe					
Hausa	227(66.6)	114(33.4)	341		
Fulani	122(73.9)	43(26.1)	165		
Kanuri	60(69.8)	26(30.2)	86		
Others	69(94.5)	4(5.5)	73	23.808	0.000*
Marital status					
Married	461(72.9)	171(27.1)	632		
Single	17(51.5)	16(48.5)	33		
Total	**478(71.9)**	**187(28.1)**	**665**	7.1243	0.008*

Table 5 shows that the household's type of abode and presence of child(ren) under-5 in a household is the household characteristics associated with healthcare relationship trust in the study population.

Table 5. Relationship between Household Characteristics and Healthcare Trust Relationship between underserved and PPMVs

	Overall trust						
	Low trust		**High trust**		**Total**		
Characteristics	Number	%	Number	%	Number	**χ2-value**	**P-value**
Number in household							
1-10	266	70.6	111	29.4	377		
11-20	173	72.4	66	27.6	239		
21+	39	79.6	10	20.4	49	1.798	0.407
Type of abode							
Permanent	442	73.4	160	26.6	602		
Semi-perm(rented)	27	55.1	22	44.9	49		
Temporary	9	64.3	5	35.7	14	7.932	0.019*
Have pregnant women in HH							
Yes	202	69.4	89	30.6	291		
No	264	74.6	90	25.4	354	2.121	0.145
Child Under-5 Member							
Yes	436	70.6	182	29.5	618		
No	42	89.4	5	10.6	47	7.647	0.006*
Health insurance Cover							
Yes	80	67.8	38	32.2	118		
No	398	72.8	149	27	547		
Total	**478**	**71.9**	**187**	**28.1**	**665**	1.183	0.277

Determinants of PPMV-Underserved Healthcare Relationship

Table 6 shows that the underserved in Kaduna state had 3.8 times higher trust in patent medicine vendors than those in Kaduna (OR=3.82, 95%CI: 2.46-5.93). Females had 6.25 lower healthcare relationship trust than males in underserved communities (OR=0.16, 95% CI:0.08-0.30). Underserved who reside in the rented building had 3.89 times higher trust than those living in owned residences (OR=3.89, 95% CI: 1.96-7.73).

Similarly, those who reside in temporary or makeshift shelters had 3.3 times higher trust than underserved living in permanent/rented houses (OR=3.3, 95%CI: 1.25 - 10.5). Findings also revealed that underserved with an under-five child(ren) in their household had 3.4 times higher trust in PPMV than those who had none(OR=3.4, 95%CI: 1.27-9.28); Unmarried heads of household had 2.5 times higher trust than married heads of households (OR=2.54, 95%CI: 1.09-5.92), and underserved with perceived good health rating had 2.48 times higher trust in PPMV than those with poor health rating(OR=2.48, CI:1.65-3.71).

Table 6. Predictors of Healthcare trust between PPMVs and the Underserved

Characteristics	High Trust (N, %)	Odds Ratio (95% CI)	P-value
State			
Kaduna	59(18.1)	1.00	<0.001
Jigawa	128(37.8)	3.82(2.46 – 5.93)	
Sex			
Male	172(31.8)	1.000	<0.001
Female	15(12.1)	0.16(0.08 – 0.30)	
Type of abode			
Permanent	160(26.6)	1.000	0.048
Semi-perm(rented)	22(44.9)	3.89(1.96 – 7.73)	
Temporary	5(35.7)	3.30(1.25 – 10.54)	
Under-5			
No	182(29.5)	1.000	0.015
Yes	5(10.6)	3.44(1.27 – 9.28)	
Marital Status			
Married	171(27.1)	1.000	0.031
Single	16(48.5)	2.54(1.09 – 5.92)	
General health rating			
Poor rating	99(20.5)	1.000	<0.01
Good rating	88(48.62)	2.48(1.65 – 3.71)	

Discussion

The finding on low trust among the underserved in this present study agrees with the conclusion of Hooper and colleagues [60] that distrust for healthcare providers in underserved communities is strong and complex. This complex nature of trust between underserved communities and their healthcare providers may explain, in part, the difference in trust levels between states, sexes, marital status, and household features. A study conducted by [61] in other climes among African Americans also found a significant relationship between trust in healthcare providers and tribe/ethnicity. However, while the ethnic minorities in that study reported lower trust in healthcare providers, the reverse is the case in this present study as only 5.5% of ethnic minorities had high trust in PPMVs compared to above 25% among the predominant tribes in the study location (Hausa, Fulani, and Kanuri). In our study, the tribe was only identified as a correlate, and it didn't predict the level of trust in PPMVs in our study population. Nguyen and colleagues [9] reported that there is no relationship between trust and the ethnic group. The observed difference in the findings could also be due to the difference in the care of healthcare providers focused on in this study. Previous authors. Previous authors [63-65] have established that disparity in the level of trust fuels health disparities across populations. These ethnic/tribal disparities in the level of healthcare relationship trust could signal the existence of further health disparities between tribal and ethnic groups in the medically underserved communities where we conducted our study.

Our study reported a lower level of trust among females than males. Despite the focus of our study on non-physician healthcare providers, our finding is consistent with that of a study [9] (among the Mexican population) and among the Swedish population [62]. This may suggest a potential difference in the expectations and experiences of men and women regarding their

healthcare providers. This finding, therefore, calls for sex-specific interventions to improve trust in PPMV as part of the processes for integrating the PPMV into the formal health system.

[66] found that age moderates the relationship between trust and perceived health status. We reported that age was not a predictor of healthcare relationship trust in our study population but found a significant relationship between trust and perceived health status. The difference in the role age played in the two studies may have been due to the difference in study populations-Katz and colleagues [66] used age groups as a recruitment criterion. The higher trust in PPMV among those who perceived their health status as good in our study is comparable with the findings of [9], where those who reported difficulty in accessing healthcare had lower trust in care providers. Other authors [67-70] have also reported a higher level of trust among those with perceived good health.

Elsewhere, low trust in healthcare providers has been attributed to low or irregular utilization of healthcare services [71-72] and lower adherence to recommendations of healthcare providers. [73] explained that low trust may result from past experiences and prior interactions.

This submission appears to explain the finding that those living in less sophisticated shelters (rented or temporary shelters) who may have patronized PPMVs more frequently due to their socioeconomic status [23] have a higher level of trust in PPMV than those who reside in own homes. A positive relationship between trust and income level has been reported in previous studies [74-75] where they concluded that income status influences the level of trust in healthcare providers.

Conclusion

The level of healthcare relationship trust between the PPMV and the residents of hard-to-reach settlements studied in Northwestern Nigeria remains sub-optimal. Personal and household characteristics could significantly influence the level of trust in non-physician healthcare providers. Therefore, to achieve the aim of improving health outcomes in deprived populations, initiatives seeking to integrate PPMVs into the formal health system in resource-constrained settings should seek to address the determinants of healthcare relationship trust in these populations as part of their rollout process.

The study could not establish a cause-and-effect relationship between the respondents' characteristics and healthcare relationship trust due to the inherent limitation of cross-sectional surveys. However, our study is the first (in Nigeria and perhaps Sub-Sahara Africa) to highlight the status of healthcare relationship trust between patent medicine vendors and residents of hard-to-reach communities. Providing this evidence at a time when Nigeria (and some other African countries) are making efforts towards leveraging PPMVs to address human resources for health challenges in rural underserved populations could potentially alert policymakers to further examine the context-specific roles of the determinants of trust as they design, refine, and implement approaches to improve healthcare access in their jurisdictions.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Utilization of Information Resources and Services among Undergraduate Students in Federal University Libraries in South-South, Nigeria

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Abstract

This study examined "utilization of information resources and services among undergraduate students in federal university libraries, in South-South, Nigeria". To achieve the purpose of this study, 3 research questions and 3 hypotheses were formulated to guide the study. Literatures related to the variables under study were reviewed; accordingly, Ex-post facto research design was adopted for the study. The population of the study was the registered users of the libraryfor2018/2019 academic session. With a total population of 16620 students and a sample of 831 respondents was selected for the study representing 5% of the population. The selection was done through the stratified and purposive random sampling technique. In this case only the student's library user that were available in the library as at the time of this research were used for the study. Questionnaire instrument was used for data collection. A total of eight hundred and thirty-one (831) copies of questionnaire were administered and eight hundred (800) copies were retrieved and found usable. Data was analyzed using Pearson's Product Moment Correlation Analysis. The results of the analysis revealed a significant relationship between the librarian's selective skills and students' use of library resources. Based on these findings, it was recommended, among others that; Librarians should continue to make sure that the right materials are purchase in the library for optimal utilization.

Keywords: *Federal university, Information resources, Libraries, Library materials, resources, south, utilization, undergraduate students.*

Introduction

The essence of having a library, fully stocked with different types of information resources is to enhance teaching, learning and research. But if these resources are not properly utilized by students and faculty members because of one reason or the other, then the purpose of establishing a library in the university would have been defeated. Thus, it is the duty of the university librarian in conjunction with management to see to it that the right and current resources are acquired at the right time to meet the information needs of the various departments and field of study in the university. Libraries are the nerve centres of every academic institution saddled with the responsibility of collecting, organizing, storing, and disseminating relevant and adequate information sources of all kinds in prints and non-prints format which are essential for the academic growth and development of students. Library renders essential services in tertiary institutions of learning. It supports the academic programmes of the parent institution by providing users with a platform where information resources can be accessed easily. Thus, meaningful academic success can only be achieved when there is a functional library with

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adequate information resources that compliments the teaching and learning process [1]. With the dawn of Information and Communications Technology information resource such as CD-ROMs, electronic books (e- books,) electronic journals (e-journals) and much more can be accessed in the library giving it tremendous opportunities of extending her services to other academic communities outside the confines of their own community and also give students more access to utilize the electronic information resources.

Libraries are pools of revealed knowledge in book and non-book formats that support the objectives of the parent organization in the provision of middle and high-level manpower for national development, through teaching, research, and community service. They heighten the production of all round graduates who will be vital agents in the socio-economic and political development of the nation. Therefore, the library is not only a valuable tool which shapes students but develops the entire nation at large. In universities, libraries serve as the positive learning environment for all users in the academic community, to fulfill its mandate of supporting the teaching, learning and research activities, it is expedient for university libraries to house current and relevant information resources that will meet the information needs of students, staff, and other library users in the academic communities. Hence, Eguaron in [2] pointed out that in selecting information resources for academic libraries, one must first consider the aims and objectives of the parent institution, the number of departments and subject areas, the number of faculty members, research and teaching needs of the academic community and the nature of information resources required in terms of prints and non-print materials. This is so because, in academic libraries, resources selected are meant to support the curriculum, thus, all hands must be on desk to make sure that the materials in the library are up to date. This means that librarians require the contribution of the teaching staff and faculty members in selecting library materials that will meet the information needs of library users. One of the services rendered by librarians is to provide the right information resources to its users.

Library information resources are essential tools in teaching and learning process of any academic community. Members of the academia need library information resources for teaching, learning, research, update of knowledge and personal development [1]. Hence, information resources in libraries ranges from print to non-print resources and are often provided for maximum use. These resources must be carefully selected and organized for effective utilization. In academic libraries, the information resources must be selected such that the materials cover the various subject areas and the departments in the institution. An academic institution houses different department with different fields of study, it is important for the librarian to select the right types of resources that will be relevant to the information needs of all these users. Nonetheless, it is not enough for the librarian to select the information resources alone, but he must also of necessity create awareness for the use of these resources through the various channels available in the library. It is this awareness that will draw the users to utilize the information resources available in the library. When students make use of information resources, it complements lectures; provide students with knowledge for their academic quests etc. Thus, as part of the services provided by the library, is to tutor the users on how to use the library and teach users the process that goes around in the library, the rules and regulations that guides the activities in the library and so on. This the librarian does through orientation, user education etc to bring the user closer to the library and form a bond between the users, the resources, and the library staff.

Therefore, students who maximally utilize information resources for further studies according to [3] turn out to be better, more productive, and outstanding in their academic performance, while those who do not utilize the information resources for further studies often perform poorly in their academic's performances. The mission of libraries as storehouses of knowledge cannot be successfully achieved if students do not utilize the information resources. This is because, knowledge is power, and libraries are pools of such revealed knowledge in all formats. The academic wellbeing, scholarly vitality and effectiveness of the students depend largely on the information resources that are available to them in the library and services provided to meet their information needs. Information resources to students are indispensible just as air, water, food, clothing, and shelter are indispensible to man. Information resources increase the ability of the students to acquire the necessary information and knowledge that boost their interest and stimulates their appetite for more information. It helps them acquire knowledge for their academic pursuits and this is possible by exhaustive utilization of information resources that are available in the library. Therefore, if a library is well stocked with several categories of information resources and the students do not sufficiently utilize the resources, then, it amounts to defeating the aims and objectives of setting up a library in the first place. Utilization of information resources is a pointer to the expected academic achievement of students and a major determinant of the future of students, and the nation at large, as great achievers are made from great readers and researchers. utilization of information resources have the potential of helping students make better academic progress and keep them ahead of their counterparts who do not utilize information resources in the library. However, the question is, are the students aware of these information resources? Also, do they know how to use them?

Awareness of availability of information resources helps students to be informed of the various information resources and services available to them in the library. Librarians create awareness through the faculties during orientation, informing students and other library users in the university community of the available information resources and the services provided in the libraries. Lack of awareness keeps students in the dark of the available library information resources and services that are in the library. This can be the major culprit responsible for the underutilization of information resources as students will not make use of the resources, they are not aware of [4]. When students come to the library for the first time, they surely do not know what goes on in the library. They need to be put through by the librarians on how to go about the whole process. User education is the basic instruction given to library users, especially first year students by librarians, on how to make effective use of information resources stored in the library to enable them to know where to find what and how to use the information resources in the library. As new students comes to school for the first time, they do not know about various activities of the library, but, through user education, orientation, etc, library staff introduces them to their services, operations, rules, and regulations to guide them on how to use the library effectively. Effective user education programme helps to create a friendly atmosphere where students, librarians and information resources interact, thereby saving students' time; exposing them to alternative sources of information on a particular subject of interest; enabling them make use of available information resources in the library. If user education is not given to students to help them create awareness on how to utilize library resources profitably to meet their academic needs, this could discourage and prevent students from going to the library as they might not know how to locate nor use the resources [5].

As important as the effective utilization of information resources is, it has been observed that students are not committed to ‘‘utilizing these library information resources provided for them as expected”. This means that students do not make use of these library materials as much as they should. This is noticeable in the low daily statistics of information resources consulted. [6] maintained that the problem of underutilization of information resources is a global one. Also, another author observed that students in Cross River State do not make use of information resources. This situation can be attributed to several factors which include lack of proper selection of information resources and lack of awareness of the availability of information resources, lack of orientation, lack of user education etc. However, tertiary institutions’ libraries have been doing their best to make sure that awareness is created, and the right orientation given to students especially the first-year students on the importance of using the library and its resources. Nevertheless, most of these factors mentioned above are caused by the university management who in their quest to make quick money push aside the university librarian who is ‘the chief bibliographic officer of the institution’ saddled with the responsibility of acquiring information materials for the institution, having gone the process of selection. They go ahead to purchase materials that are not needed in the library thereby causing underutilization of library resources. This situation is seen and witnessed in our Nigerian universities today. Stressing the need for the utilization of ‘‘information resources”, [7] opine that utilization of information resources refers to the way in which students make use of the resources iñ the library to meet their information needs’’. Also [8] define utilization of information as the actual use of library materials by students. According to him, this justifies the purpose of establishing academic libraries in federal universities. Information resources refer to the numerous media by which information is recorded for students and scholars to help them meet their educational needs and these resources function as means through which students are exposed to academic accomplishment. They are expected to support the curriculum and extracurricular activities which positively contribute to their academic success. Students who uses information resources in the library for all their curricula needs such as doing assignments, writing of test, writing of term papers, seminars papers, and preparing for examinations are most likely to perform better than their counterparts who do not utilize the resources. Hence, library resources must be selected to suit the purpose and aims of the parent institution. Therefore, this study was conducted to investigate whether the type of information resources selected, the awareness created, and user education given to students relates to their utilization of information in academic libraries. The study seeks to find out whether it is possible for students not to use library resources when they have the best information resources selected for them awareness have also been created for them and user education given to them on how to use the information resources in the library. It is against this backdrop that the study attempts to examine the utilization of information resources and services among undergraduate students in federal university libraries in south-south, Nigeria.

Purpose of the Study

The purpose of this study was to investigate whether the type of information resources selected, the awareness created, and user education given to students relates to their utilization of information in academic libraries in south south, Nigeria. Specifically, the study seeks to:

1. Examine the relationship between information selection and utilization of information resources.
2. Determine the relationship between awareness of availability of information

resources and utilization of information resources.
3. Find out the relationship between user education and utilization of information resources.

Research Question

The following research questions were raised to guide the study:

1. How does lnformatio selection relate to utilization of information resources?
2. How does awareness of availability of information resources relate to utilization of information resources?
3. What is the relationship between user education and utilization of information resources?

Statement of Hypotheses

To properly guide the conduct of this study, the following hypotheses were formulated:

1. Information selection does not significantly relate to utilization of information resources.
2. There is no significant relationship between awareness of availability information resources and utilization of information resources.
3. User education has no significant relationship with utilization of information resources.

Literature Review

Academic libraries in general, have the special responsibility of selecting appropriate information resources for learning and research to support the objectives of the parent institution. According to [9] and [2], information resource selection is the art of giving preference to needed information resources to be acquired from a list of publications for the university libraries. This demands that the library should have a well-defined selection policy which may be peculiar to the institution. Librarians are advised against acquiring those information resources that may not be utilized by the students. This is supported by [10] who opined that there should be a specific policy with regard to selection of materials. This policy should specify the type and range of items to be selected and acquired so as to reflect the objectives of the parents' institution. A university library, being a complex institution must have large quantities of materials to meet the demands of the numerous students, lecturers, faculty officers and the host community. They provide a wide variety of services important to serve the needs of its users [11].

[12] emphasized that the selection of information resources is a first step in the acquisition process. It is based on the perceived expediency of these resources to the users. This is because the amount of fulfillment a user finds in using the library directly depends on the available information resources for his use. Hence, the justification for giving preference to selection of information resources before its acquisition from the excess of titles published every year to enrich its collection. [13] stressed that selection of information resources in academic libraries helps the librarians to isolate the resources relevant to them because of explosion of literature and decrease in library budget. Notable selectors should target satisfying the existing demand, anticipate future needs by users and ensure that good quality information resources are provided, avoid bias in selection and ensure that the right kind of information resources are provided at the right time.

However, most authors suggested that library and information professionals should strive hard to know who their users are, and what they want, and what are their desires as well as their aspirations in order to select the necessary materials to meet their needs. Globally, modem libraries are still maintaining enormous information resources in book and non-book formats, making them available to their users. According to [14], for learning to be effective, learners must have access to the right information resources that will help them in

their learning. They have to interact with tangible and non-tangible information resources to ensure their academic excellence. Stressing the importance and benefits of utilizing information resources in the library, [15] observed that students are either not aware and or not making optimum use of these vital resources. She went ahead to note that, of what benefits are resources when they are not utilized for the purpose for which they are acquired? Recognizing the fact that the use of resources is part of assessment performance in academic libraries, librarians are increasingly concerned with the use of library products and services as they go all out create awareness through the various channels. Osinulu cited in [16] also confirmed in her study that students lack use of library materials is as a result of lack of awareness on their part.

Consequently, [17] examined the relationship between awareness and use of electronic information resources by undergraduate students in private universities in Oyo State, Nigeria, the study adopted a descriptive survey design and questionnaire was used for data collection. The findings of the study revealed that the undergraduate students are aware of the available electronic resources in the universities, the Internet resources and online databases are the most used electronic information resources (EIRs). However, ElRs were perceived as complex, non-flexible and difficult to use. The findings of the study indicated a positive relationship between student's awareness and use of EIRs, A positive relationship was also found to exist between perceived ease of use and use of EIRs. The study recommended that libraries should create awareness through email alerts and provide technical support and training to ensure optimal use of EIRs by undergraduate students.

Also, [15] conducted a study to examine the awareness and use of electronic Information Resources (EIR) among students in College of Health Sciences, Sagamu, Nigeria. The objective of the study was to establish the different types of materials available, ascertain the level of awareness and the problems faced by users. The study used descriptive survey design and a questionnaire instrument was structured to elicit information from the respondents. The population of the study comprised 2000 students using purposive sampling technique to select the sample of 200 students for the 2019/2020 academic session. Data was analyzed using descriptive statistics. The findings revealed among others that majority of the students were not aware of the availability of EIR. Based on the finding's recommendations were made.

[1] carried out a study to examine the utilization of information resources by undergraduates' students at University of Medical Science, Ondo, Ondo State, Nigeria. Descriptive research design was employed for the study. With a population of 234 registered library users for the 2016/2017 academic session. The study adopted availability sampling technique. In this case only the student's library user that were available in the library as at the time of this research were used for the study. Questionnaire was used as the instrument for data collection. A total of two hundred and seventy-six (276) copies of questionnaire were administered and two hundred and thirty-four (234) copies were retrieved from the respondents. The data gathered through the questionnaire were analyzed through the use of frequency count and simple percentage. According to the findings the respondents agreed to the availability of all the listed resources in the questionnaire. The findings also revealed that majority of the respondents use the library information resources occasionally. Based on the findings of the study, some recommendations were made to enhance better use of the library information resources in the University of Medical Science Ondo, Ondo State, Nigeria.

Furthermore, [11] carried out a study to examine the attitude of library and information

science students towards the use of electronic information resources in some selected university libraries in Rivers State. Descriptive survey design was adopted for the study. With a total population of 325 registered users, using the proportionate random sampling technique to draw the sample for the study. A structured questionnaire item was the instrument for data collection. And the collected data was analysed using mean and real limits of numbers for ranking. The findings of the study revealed that the attitude of library and information science students in all the area under study has an influence on their perception and the frequency of utilization of electronic information resources. As a result of non-use of electronic resources and lack of skills, this has resulted in low level of performance in students. Based on the findings, it was recommended that the university library should establish adequate e-library facilities for the students' use among others. [18] defined it as a programme that is well planned for the training of library patrons on the skills and techniques of locating and retrieving library materials. [19] asserted that user education programme provides fresh students with the knowledge on how to effectively and efficiently access, locate, retrieve and utilize library information resources and services. [20] opined that user education will not only assist students to know how to use the library alone but also assist them become independent users. Students will develop confidence and ability in locating information if they can quickly find materials on a given subject, using the card catalogue or empirical index. [21] opined that libraries should educate undergraduate students more on how to use the library and its resources to enhance greater utilization of the resources and consequently, academic excellence. The programme gives students the opportunity to utilize library facilities available to them independently and locate information resources provided with ease.

[22] carried out a study to relate user education programmes of Abia State College of Education (Technical), Arochukwu (ASCETA) and Alvan Ikoku Federal College of Education, Owerri (AIFCE) with library use. Questionnaire and interview was the major instrument for data collection. Data was analyzsed using Pearson Product Moment Correlation (PPMC), mean scores and frequency tables. The outcome of the findings revealed that user education programme enhances utilization of library resources among others. Based on the findings it was recommended that adequate fund should be provided to acquire the necessary information resources.

[23] investigated the effect of user education on law students' use of library materials in Imo state university library Owerri. The study adopted survey research design and data was collected with the help of a questionnaire instrument, with a population of all the registered library students of faculty of law. In order to give direction to the study, six research questions were answered and data was analysed using mean scores. The findings of the study revealed among others that user education programme has positive effect on law students' use of library and its resources. The researchers recommended that adequate and qualified librarians should be employed to teach user education programme, and the time allocated to the teaching of the course should be relevant. More time should be allocated to the course. From the literature reviewed, it was observed that several studies have been conducted in library utilization, utilization of electronic library, students' use of academic library etc. So far, from the literature gathered it appears to the best of the knowledge of the researchers that not many studies have been conducted on this topic using the joint influence of these variables. However, previous studies in the study area focused on some aspect of the variables and utilization of information resources. This study focuses on three (3) variables of information utilization and services

among undergraduate students. Hence, this study is determined to find out whether if the best information resources are selected for students with right awareness created and a good user education given, it will increase utilization of information resources. To the best of the researcher's knowledge no study has been carried out specifically on utilization of information resources using the same variables, using the same 2018/2019 population and using the same methods in federal university libraries in south-south. This is the gap that this study seeks to fill.

Methodology

The research design adopted for this study was the ex-post facto design and the population of this study comprised sixteen thousand, six hundred and twenty (16620) registered students in the various federal university libraries in South-South. The break down showed that the registered students in University of Calabar were 3574 (21.25%), University of Uyo 3909 (23.24%), University of Port-Harcourt 3625 (21.55%), Federal University Otuoke 1501 (8.92%), and University of Benin 4011(23.85%). A stratified random sampling technique involving the purposive sampling technique was adopted for this study. The sample of this study was made up of eight hundred (831) students who have registered in their libraries, from the five federal university libraries. A structured questionnaire was used to collect information from the respondents. Out of the 831 copies of questionnaire administered, only 800 copies were returned and usable.

The instrument was divided into three main sections. Section A was designed to collect the respondents' Personal data (PD). Section B was made up of 18 items that were designed to elicit responses on each sub-independent variable each component has six items. ''The components include selection of information resources, awareness of availability of information resources, users' education of information resources". Section C was on utilization of information resources which was made up of six items on perceived utilization of information resources, the respondents were required to indicate the extent to which the given statements applied to them on a 4-point-Likert Scale of Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD).

Results and Discussions

Hypothesis One

Selection of information resources does not significantly relate to utilization of information resources.

Table 1. Universities and population distribution of registered students in federal university libraries in South-South in 2018/2019

State	University	No of faculties	No of male students	No. of female student	Total
Akwa Ibom	University of Uyo	13	1752	2157	3909
Bayelsa	Federal University of Otuoke	8	650	851	1501
Cross River	University of Calabar	13	1616	1958	3574
Edo	University of Benin		1856	2155	4011
Rivers	University of Port Harcourt	12	2010	1615	3625
Total	**5**		**7884**	**8736**	**16620**

Sources: Library records, office of the university librarians of the federal university/ Libraries in 2018/2019

Table 2. Pearson "Product Moment Correlation Analysis of the Relationship between Selection of Information Resources and Utilization Resources" (N=800)

Variable	$\bar{X}$	SD	R-value	P-level
Selection of information resources	14.34	3.43	.235*	.000
Acquisition of information resources	15.04	3.36		

*Significant at p-value, df=798

The independent variable in this hypothesis is selection of information resources while the dependent variable is utilization of information resources. To test this hypothesis, "Person product moment correlation analysis was employed''. The result of the analysis is presented in Table 2. The result in Table 2 reveals that the calculated r value of 235 is greater than the critical r value of .088 at .05 level of significant with 798 degrees of freedom. With this result the null hypothesis was rejected. This result implies that selection of information resources significantly relate to utilization of information resources. This means that the more the selection of information resources, the higher the utilization of information resources by students.

Hypothesis Two

There is no significant relationship between awareness of availability information resources and utilization of information resources.

Table 3. Pearson Product Moment Correlation Analysis of the Relationship between Awareness of Availability Information Resources and Utilization of Information Resources (N=800)

Variable	$\bar{X}$	SD	r-value	p-level
Awareness of information resources	13.69	3.41	.194	.000
Utilization of information resources	15.04	3.36		

*Significant at p-value, df=798

The independent variable in this hypothesis is awareness of availability information resources while the dependent variable is utilization of information resources. To test this hypothesis, Person product moment correlation analysis was employed. The result of the analysis is presented in Table 3. The result in Table 3 reveals that the calculated r-value of .194 is greater than the critical r-value of .088 at .05 level of significant with 798 degrees of freedom. With this result the null hypothesis was rejected. This result implies that there is a significant relationship between awareness of information resources and utilization of information resources.

Hypothesis Three

User education has no significant relationship with utilization of information resources.

Table 4. Pearson Product Moment Correlation Analysis of the Relationship between User Education and Utilization of Information Resources (N=800)

Variable	$\bar{X}$	SD	r-value	p-level
User Education	15.24	3.21	.348*	.000
Utilization of information resources	15.04	3.36		

*Significant at p-value, df=798

The independent variable in this hypothesis is user education while the dependent variable is utilization of information resources. To test this hypothesis, Person product moment correlation analysis was employed. The result of the analysis is presented in Table 4. The

result in Table 4 reveals that the calculated r-value of .348 is greater than the critical r-value of .088 at .05 level of significant with 798 degrees of freedom. With this result the null hypothesis was rejected. This result implies that user education has a significant relationship with utilization of information resources.

Discussion of Findings

This section is concerned with the discussion of findings that emerged from the results of the analysis. The discussion is presented according to the hypotheses of the study.

Selection of Information Resources and Utilization of Information Resources

The result of the hypothesis revealed that selection of information resources has a significant relationship with utilization of information resources. The selection of information resources is very important and a first step in making available relevant materials. Proper selection of information resources increases the use of such information resources as students tend to make use of the resources that meet their information needs. This is because the amount of achievement students finds in utilizing the library directly depends on the relevance and accuracy of the information resources. This finding agrees with the view of [13] who stressed that selection of information resources in academic libraries helps the librarians to isolate the resources relevant to them. ‘‘The use of information resources is therefore presumed upon adequacy to satisfy the needs of the students”, affirming this view, [17] suggested that library and information professionals should strive hard to know who their users are, and what they want, and what are their desires as well as their aspirations to select the necessary materials to meet their needs. As librarians, knowing the type of materials to be selected, guarantees that such materials will be utilized effectively. This agrees with the study of [9] and [2] who observed that information resource selection is the art of giving preference to needed information resources to be acquired from a list of publications for the university libraries.

Awareness of Availability of Information Resources and Utilization

The result of the hypothesis indicated that “there is a significant relationship between awareness of availability of information resources and utilization of information resources’’. Awareness of availability of information resources is a strong motivation for utilization of such information resources. There may exist an up-to-date library with diverse forms of information resources, but with low patronage due to inadequate or lack of awareness campaigns to bring to the notice of the students, the available information resources and services provided by the library. The purpose of establishing the library will be defeated. It is therefore vital for librarians to create awareness concerning the library and its resources. This view is in line with the views of [15] whose study revealed that students are not aware of the resources in the library. Lack of awareness of availability of information resources tends to prevent students from utilizing the information resources made available in the library. Affirming this view, [11] noted that poor attitude of students towards utilization of library resources has resulted to low performance of students due to non-use of information resources.

User Education and Utilization of Information Resources

The result of the hypothesis reveals that User education has a significant relationship with utilization of information resources. User education is a core activity of academic libraries that entails educating, enlightening, guiding, and helping the students to identify, understand and utilize library information resources effectively. It provides students with the ability to utilize library facilities available to them independently and locate information

resources provided with ease. This is in line with the studies of [22] and [23] who observed that user education enhances utilization of information resources and has positively affected the students' use of library materials. The findings of this study agree with the findings of [19] who stressed the relevance of user education to the use of academic libraries by students of tertiary institutions. This means that when students are given orientation on how to use the library, it encourages the students utilize the materials. Hence, user education has the tendency of affecting the utilization of library resources positively.

Summary of Findings

The results were subjected to testing at .05 level of significance. The result of the analysis revealed that:

1. Selection of information resources significantly relate to utilization of information resources. That is when selection is done according to the demand of the academic community, it will meet the information needs of students and there will utilization of information resources by students.
2. There is a significant relationship between awareness of availability of information resources and utilization of information resources. If the libraries advertise make students know about their holdings and services, students will utilize the information resources maximally.
3. User education has a significant relationship with utilization of information resources. If students are taught on how to utilize the library information resources effectively, there will be increate utilization.

Conclusion

Based on these findings, it was concluded that selection of information resources, awareness of availability of information resources and user education of information resources significantly relate to utilization of information resources in the university libraries. This implies that where the information resources are excellently selected, awareness created, and users' education provided there will be maximum utilization of information resources by students in federal university libraries.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Librarians should continue to make sure that the right materials are purchase in the library for optimal utilization.
2. Selection of information resources should be open to stakeholders to enable them make inputs to cover the various disciplines.
3. Librarians should continue to create awareness about the library, its holdings, and services to keep the students informed all time.
4. User education should be adequately given to students to enable them to make the most use of the information resources. More time should be allocated to the course.

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Conflict of Interest

There was no conflict of interest.

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Impact of Performance-Based Financing (PBF) Program on Utilization and Completeness of Partographs in Jimma

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Abstract

One of the most important quality thematic areas incentivized in PBF is maternity services which among other aspects include the use and completion of partographs when monitoring women in labor. Use f partographs during labor is a key intervention but it is not widely used due to various factors. Thus, the PBF program in Jimma sought to strengthen its use and completion since Q4 2019. A quasi-experimental design was used to review 7,260 mothers' records from 2018, 2019 and 2021 from both Buno-Bedele (control) and Jimma (intervention) zones. Impact of the PBF program on partograph utilization and completeness was estimated using difference-in-differences (DiD) models in STATA 15. In 2019, partograph utilization was estimated to be 29.2% (CI: 26.6% - 31.8%) in Jimma and 23.5% (CI: 21.1% - 25.9%) in Buno-Bedele. In 2021, utilization increased to 87.2% (CI: 85.3% - 89.2%) in Jimma and 41.4% (CI: 38.7% - 44.2%) in Buno-Bedele. Out of the labor cases monitored with partographs, the completeness was 60.2% (CI: 58.1% - 62.4%) in Jimma and 51.6% (CI: 49.5% - 53.6%) in Buno-Bedele in 2019. In 2021, the completeness increased to 83.2% (CI: 82.3% - 84.2%) in Jimma and but remained the same in Buno-Bedele, 51.3% (CI: 49.7% - 52.8%). PBF accelerated the rate of improvement for both utilization (DiD: 30.8%, p-value < 0.001) and completion (DiD: 24.9%, p-value < 0.001) of partographs. Incentivizing facilities to improve quality of care coupled with coaching and mentorship of health workers is effective in improving quality of service for pregnant women in labor and delivery.

Keywords: *Labor and delivery, Maternity, Partographs, Performance based financing, Pregnancy.*

Introduction

Globally, in 2017, 295 000 maternal deaths occurred due to complications during pregnancy or childbirth [1]. Of these deaths, 196 000 (66%) were specifically in Sub-Saharan Africa [1]. The life-time risk of a woman dying from preventable or treatable complications of pregnancy and childbirth in Sub-Saharan Africa is higher compared to developed countries [2, 3] s. According to the 2015 Ethiopia Demographic and Health Survey, maternal mortality ratio was 353 per 100,000 live births in Ethiopia [4-6]. In year 2019, maternal mortality ratio was 412 deaths per 100,000 live births in Ethiopia [7] with the major causes of maternal mortality related to poor labor and delivery care [7-9]. Most of the maternal deaths and complications in Ethiopia are attributed to obstructed and prolonged labor [7-9]. These can be prevented by using the partograph which is cost-effective and affordable health intervention [10-13].

While using a partograph during labor is a key proven intervention in the reduction of maternal labor complications and mortality, it is not widely used in Ethiopia due to various reasons [10-13]. Accordingly, the utilization of partographs is poor in Ethiopia [14]. It is either inconsistent or used incorrectly across different

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settings regardless of WHO recommendations and well-known added value. For example, in Bangladesh the utilization rate of partographs was very high at 98 % of women in labor [15]. However, in Africa the rate of partograph utilization was less than 50 % [16-18]. According to a study conducted in Ethiopia in 2013 by Abebe, majority (99%) of the participants knew about the partographs however, only 21.8% of them indicated utilization of the partograph can reduce maternal and newborn mortality [19].

According to different studies done in Ethiopia the magnitude of the utilization of partograph have a wide variation from region to region and across zones of the same region [20-29]. Studies conducted in the eastern and central zone of Tigray regional state reported the highest level of utilization from around 70 to 83 % [21, 23]. However, in contrast a study in the West Shoa zone of Oromia regional state reported the lowest utilization of partograph which was 31 % [20]. The magnitude of utilization of partograph in others region such as East Gojam Amhara Region, was 53 %, in SNNPRE Hadiya zone 54 %, and Wolayita Zone 71 % [4, 26, 27]. For the studies conducted in Addis Ababa, 57% to 69 % of obstetric caregivers utilized partograph routinely [22, 28]. The largest difference in the utilization of partograph is seen in different zones of Oromia region ranging from 31, to 71 % [20]. There are no similar studies which have been conducted specifically in Jimma zone. Thus, the PBF program in Jimma sought to strengthen the use and completion of partographs through coaching and mentoring of health workers by PBF auditors and Woreda Health experts since Q4 2019.

One of the most important quality thematic areas incentivized in PBF is maternity services which among other aspects include the use and completion of partographs when monitoring women in labor. A partograph is a simple printed graphical paper tool on which labour, maternal and foetal observations are documented [9, 23, 24, 30]. The main use of the partograph is to provide a summarised overview progress of labour to the clinicians that alerted of any deviations of maternal and foetal well-being and labour progress [31, 32]. Friedman's concept was developed into a paper tool for monitoring labour progress by adding action and alert lines on the graph in 1972 [31]. The partograph was revised by WHO to ensure that it monitors more comprehensively progress of labour and equally important the condition of the woman and the foetus during labour [33]. It consists of four main sections namely the maternal information, the foetal conditions record, the labour progress record, and the maternal conditions record [23, 24, 34]. The foetal condition section tracks foetal heart rate, amniotic liquor, and moulding of the foetal skull [4, 23, 30]. The labour progress section tracks cervical dilatation and descent of the foetus' head over time, comparing it to a pre-printed "alert" and "action" lines [4, 23, 30]. The maternal conditions record often captures contractions, blood pressure, pulse, urine output, temperature, and drugs administered including drugs to help the uterus contract [9, 14, 24, 31, 34, 35]. These parameters should be monitored frequently and plotted on a printed paper partograph [31, 34]. This monitoring data plotted on a partograph allow the clinicians to identify any possible early deviations and make timely decisions regarding to appropriate intervention or referral [31, 35]. Early detection of prolonged or obstructed labor greatly contributes to the prevention of complications such as postpartum hemorrhages, ruptured uterus, puerperal sepsis, and obstetric fistula [31, 35]. Use of partographs is the best intervention in managing women in labour and reducing complications and mortality during labor and delivery [10-13]. Various studies confirm that partographs is one of the best tools available [10-13]. It is the best proven simple instrument to help a clinician detect timely whether labour is progressing normally or not and to warn if there are signs of foetal distress

or if the mother's vital signs deviate from the normal range [35]. Partographs are referred to as an "early warning system" that helps in early decisions on transfer, intervention decisions in hospitals [29]. It also causes an impact on bettering the quality of intrapartum care, maternal health, and birth outcomes [36-38]. Partograph utilization refers to plotting or recording all the details and parameters on the partograph correctly and interpreting to make appropriate decisions and intervene where necessary [20]. The use of the partographs in monitoring women in labour reduced the incidence of prolonged labour from 6.4% to 3.4%, the proportion of labour requiring augmentation from 9.9% to 8.3%, and intrapartum stillbirth rate from 0.5% to 0.3% [35]. In a study conducted in Jimma University specialized hospital, the incidence of obstructed labour was 12.2% of which about 45.1% developed uterine rupture and 39.3% had sepsis with other complications [39] and these complications were preventable if partographs were used correctly [40]. Health workers do not always use the partograph due to various reasons like lack of human resources, time of admission, knowledge and training, attitude, Sex, low competence, lack of on-going facilitative supervision, acceptability of the tool and lack of functioning referral mechanisms [9, 30, 41, 42]. These challenges coupled with lack of institutionalized policy to utilize partograph usually hinder the effective use of the partograph [9, 30, 41, 42]. This study did not assess the factors associated with partograph use and completion by health care workers. Furthermore, while data on mothers' demographics and summary of birth were collected, the study was not designed to measure the association between birth outcome and use of partograph during labor and delivery with high statistical power.

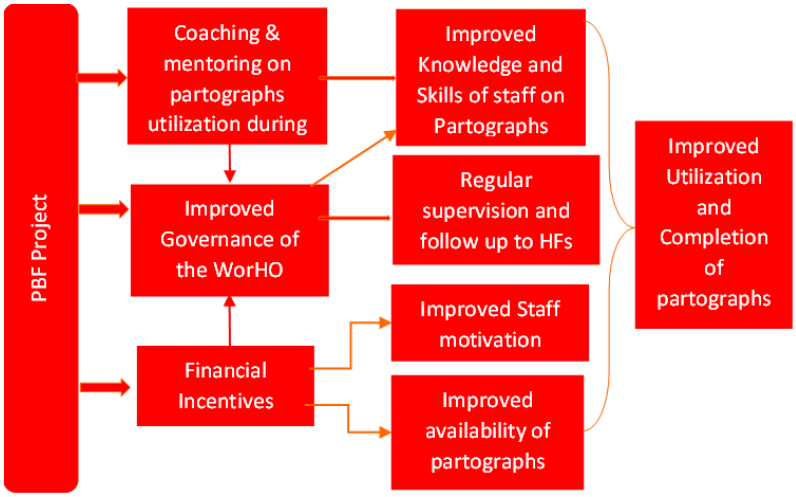

Figure 1. Conceptual Framework of how PBF has Impacted the Utilization and Completeness of Partographs

PBF is a complex and multifaceted approach which incentivises health facilities based on predefined performance and that acknowledges the systemic nature of health systems [43]. PBF interventions are generally part of a broader health system reform that includes autonomy, supervision, monitoring, and community oversight or engagement in facility management [44, 45]. Some authors assert that health workers respond to financial incentives by becoming more motivated to deliver better care, for example, through better adherence to clinical guidelines (including use of partographs) and by adopting strategies to achieve better quality [46-48]. PBF improves quality of care [49-58]. PBF also strengthens the regulatory function and improves supervision aspect [59].

The aim of the study was to determine the impact of PBF program on utilization and completeness of partograph in Jimma and Buno

Bedelle zone. The following were the study objectives.

1. Determine the proportion of institutional deliveries with a partograph documented during labour and delivery among PBF and non-PBF facilities.
2. Among institutional deliveries with a partograph documented, determine the completeness of partographs among PBF and non-PBF facilities.

Assessing utilization and completeness of partograph by the health workers has a critical value to inform the design of appropriate intervention strategies to improve provide quality maternity care. Understanding the utilization and completeness levels is important as basis for further research on associated factors. Therefore, the purpose of this study was to determine the impact of PBF program on utilization and completeness of partograph in Jimma and Buno-Bedelle zones, Oromia Regional State Ethiopia.

Methods

The study was conducted in health facilities of both Jimma and Buno-Bedelle zones from December 13, 2021, to May 13, 2022. Jimma zone was the intervention site while Buno-Bedelle zone was the control site. Since the launching of the PBF program in Jimma Zone in October 2019 (phase 1), it has been implemented in 13 Woredas. From January 2021 (phase 2), the program was scaled up to the remaining 8 woredas of the zone, involving a total of 7 DH (District Hospitals), and 121 HCs (Health Centers), with estimated 3.7 million inhabitants. However, this study only assessed the impact of PBF on partograph use and completion in health facilities in phase 1.

Our study relied on a quasi-experimental design with an independent control (Buno-Bedelle zone). Health facilities in the intervention sites were exposed to PBF intervention while the control health facilities did not have the intervention. Health facilities in the intervention sites were receiving regular performance-based subsidies coupled with rigorous regular mentoring and coaching by PBF verification teams and supervisors from worada and zonal health office on proper partograph utilization. The control health facilities were not exposed to these activities. The data collection was retrospective review of 7,260 delivering mothers' records from Q3 2018, Q3 2019 and Q3 2021 from both Buno-Bedele (control) and Jimma (intervention) zones.

We estimated the difference-in-differences (DiD) to assess the impact of PBF on partograph use and partograph completion. Data from Q3 2018 and Q3 2019 were used to test the assumption of parallel trends which is critical in difference-in-differences (DiD) estimation when assessing program impact. Difference-in-differences estimators were calculated using the alternative assumptions (60). The application of alternative assumptions in STATA allow for the test of parallel trends and produce DiD estimates for both the case when parallel trends exists and when they do not exist (60). All data analysis was conducted in STATA 15.

Results

Table 1. Delivering Mothers' Demographic Characteristics

Indicator	Period	Jimma	Buno-Bedele
Age	2018	24.8 (10.2)	24.4 (11.5)
	2019	25.1 (7.7)	24.4 (9.3)
	2021	25.3 (6.5)	24.0 (9.7)
Parity	2018	2.1 (1.7)	1.7 (1.3)
	2019	2.2 (1.9)	1.7 (1.5)

	2021	2.3 (1.9)	1.6 (1.4)
Gravida	2018	3.1 (2.1)	2.7 (1.7)
	2019	3.3 (2.2)	2.8 (1.9)
	2021	3.4 (2.1)	2.7 (1.9)
History of Complications	2018	738 (1.1%)	533 (0.6%)
	2019	1,021 (6.6%)	578 (4.5%)
	2021	1,130 (6.6%)	709 (2.5%)
Tested for Syphilis	2018	1,193 (10.5%)	1,226 (10.1%)
	2019	1,195 (17.7%)	1,234 (21.4%)
	2021	1,176 (61.6%)	1,224 (31.0%)

The average age of delivering mothers was 24.7 years (SD = 5.1) with Jimma having a higher average age of 25.1 (95% CI: 24.8 – 25.4) compared to Buno-Bedele with an average age of 24.3 (95% CI: 23.9 – 24.6). Consequently, the averages of both parity and gravida in Jimma of 2.2 (95% CI: 2.1 – 2.3) and 3.3 (95% CI: 3.2 – 3.4) respectively were higher than in Buno-Bedele with averages of 1.7 (95% CI: 1.6 – 1.7) and 2.7 (95% CI: 2.7 – 2.8) for parity and gravida respectively. This is because age, parity and gravida are collinear. The proportion of women with recorded history of complications, including caesarian sections, was 4.2% (n = 4,709) on average. Jimma had the higher average proportion women with recorded history of any complication of 5.2% (95% CI: 4.4% - 6.0%) compared to Buno-Bedele average of 2.6% (95% CI: 1.8% - 3.3%). Testing for syphilis during pregnancy was low, with an average of 25.2% (n = 7,248). Jimma had a higher average syphilis testing of 29.8% (95% CI: 28.3% - 31.3%) compared to Buno-Bedele with an average of 20.8% (95% CI: 19.5% - 22.2%). Table 1shows a summary of the demographic composition of the mothers' records reviewed by zone and year.

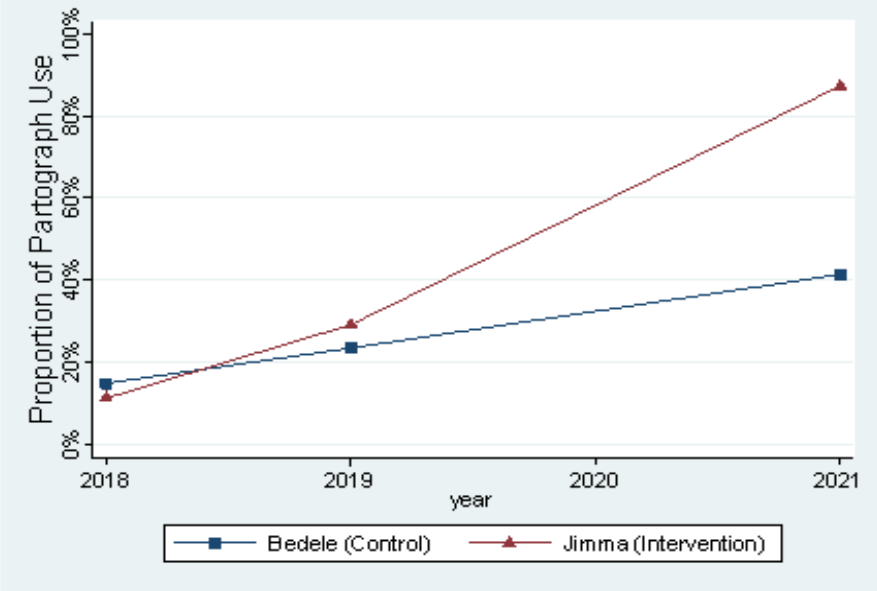

Figure 2. Trends in Percentage of Partograph use by Zone

In 2019, the magnitude of partograph utilization was estimated to be 29.2% (95% CI: 26.6% - 31.8%) in Jimma zone and 23.5% (95% CI: 21.1% - 25.9%) in Buno-Bedele. In 2021, utilization increased to 87.2% (95% CI: 85.3% - 89.2%) in Jimma zone and 41.4% (95% CI: 38.7% - 44.2%) in Buno-Bedele. The trends in partograph utilization between Jimma

and Buno-Bedele prior to introduction of PBF were not parallel (p-value < 0.001), thus violating the parallel trends assumption in DiD estimation. As such, the impact of PBF was estimated using alternative assumptions which considered non-parallel trends. PBF was found to significantly increase the utilization of partographs (DiD: 30.8%, p-value < 0.001).

Of the mothers whose labor was monitored with partographs, the completeness was 60.2% (CI: 58.1% - 62.4%) in Jimma and 51.6% (CI: 49.5% - 53.6%) in Buno-Bedele at baseline (2019). In 2021, the completeness increased to 83.2% (CI: 82.3% - 84.2%) in Jimma but did not change in Buno-Bedele, 51.3% (CI: 49.7% - 52.8%).

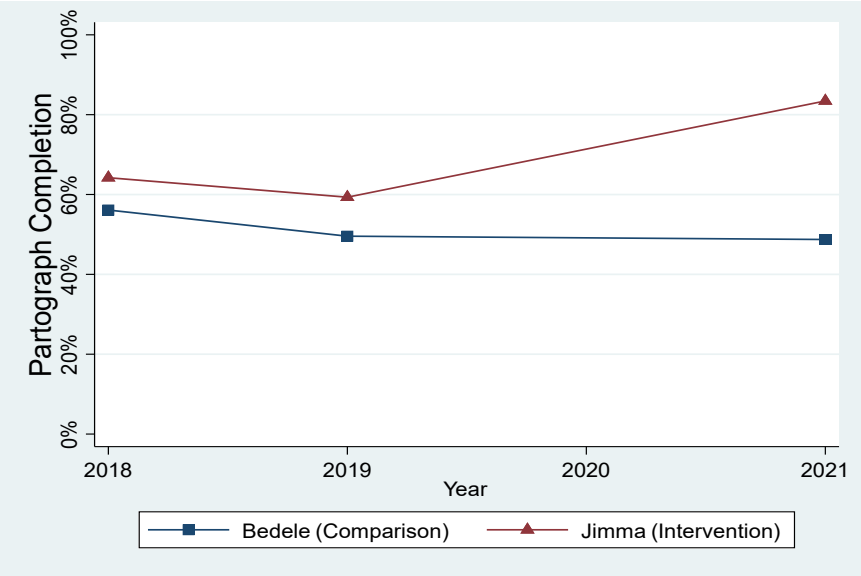

Figure 3. Trends in Percentage of Partograph Completion by Zone

Generally, completion of all sections of the partograph in Jimma improved significantly between baseline (2019) and 2021, although the completion of the maternal condition remains lowest (Figure 4). For Buno-Bedele, completion of all sections did not change significantly between baseline and 2021, with foetal condition and maternal condition still lower than 50% (Figure 5).

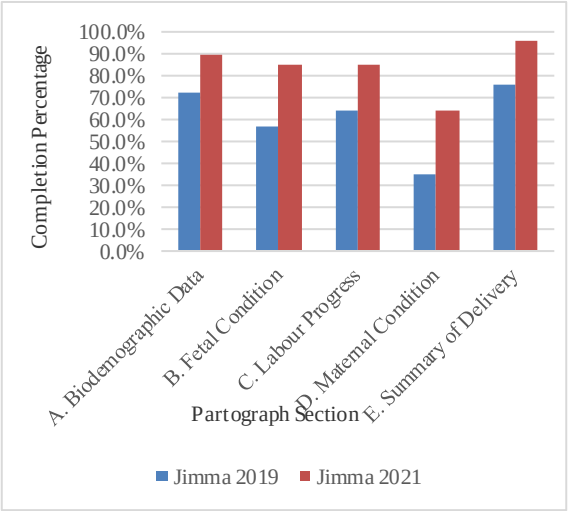

Figure 4. Partograph Completion by Section, Jimma Zone, 2019 and 2021

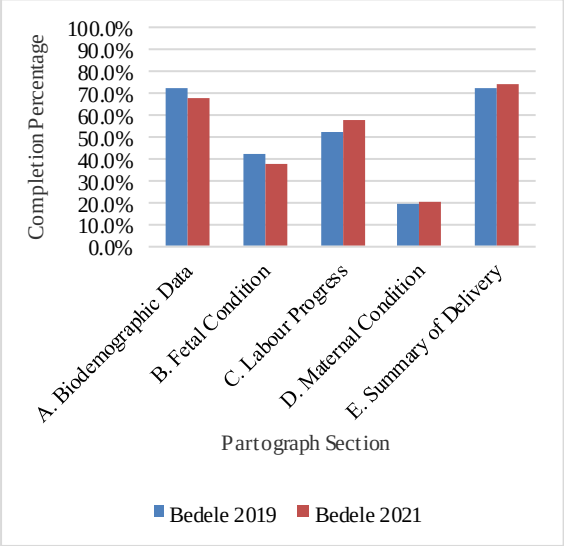

Figure 5. Partograph Completion by Section, Buno-Bedele zone, 2019 and 2021

The trends in partograph completion between Jimma and Buno-Bedele (Figure 3) prior to introduction of PBF were parallel (p-value = 0.591). Thus, the impact of PBF on partograph completion was estimated using standard DiD assumptions. PBF was found to significantly increase the completion of partographs (DiD: 24.9%, p-value < 0.001).

Table 2. Impact of PBF on Partograph Utilization and Completeness using Difference-in-Differences (DiD)

	DiD	**95% CI**	**p-value**
Partograph Use	30.8%	22.6% - 39.0%	<0.001
Partograph completeness	24.9%	21.2% - 28.7%	<0.001

Note: DiD estimates for partograph use were produced using alternative assumptions

Discussion

This study revealed that PBF program in Jimma zone has strengthened the utilization and completion of partographs among obstetric care provider found in Jimma zone through coaching and mentorship of health workers by PBF verifiers and Woreda Health experts since Q4 2019. Unlike other studies Our findings for Jimma partograph utilization indicate 87.2% and 41.4% for Buno-Bedele and the difference can be attributed to obstetric care providers who have been incentivized through performance-based financing and given mentorship and coaching in Jimma. According to the systematic review and meta-analysis studies done in Ethiopia the overall pooled prevalence of partograph utilization was low (59.95%) [29]. The differences between these findings might be due to difference in levels of knowledge and attitude of obstetric care providers and adherence in implementation of partograph for all laboring mothers.

In comparison with other studies in Africa, our study findings in Jimma on partograph use prevalence compares with that found in South Africa which was for 79.4%, Ghana 87%, Gambia 78%, and Uganda 69.9% [61-64]. Different reasons may account for these differences for example level of knowledge of obstetric care providers on the use of partographs differ across countries [65; 66]. There are also and different interventions and strategies in enforcing partograph utilization [65; 66]. For example, in Ghana, obstetric care providers received specific training in the use of partograph, while 83.8% trained in South Africa [66; 65]. Our study findings are in-line with a study in Uganda where partograph use was enhanced through training, coaching, and

mentoring [67]. In Burkina Faso, PBF also contributed in better partograph utilization in the intervention sites compared to control sites [68]. Other reason for variation of results could be differences is study designs and years of studies [69].

In 2020 the national estimated prevalence of partograph use among obstetric care providers in Ethiopia was 59.95% (95% CI 46.8–73.09, I^2 = 99.4%, $P < 0.001$) (69). Our study findings are in-line with this national prevalence and with prevalence in different regions [20-29]. In Ethiopia, there is no consistent use of the partograph during labour; Studies done in Asella referral and teaching hospital, Sidama zone, Bale zone, East Gojjam zone, Addis Ababa city administration; showed that 26%, 50.7%, 70.2%, 53.85% and 69% of the participants used partograph to monitor progress of labour respectively [8, 22, 23, 27, 30, 70].

During PBF quality assessments the teams check if partographs are used to monitor every delivery and scores awarded accordingly. For those women who were monitored using partographs, a randomly selected sample of partographs are checked for completeness. All paragraph components are thoroughly checked, and health facilities get scores which translate to monetary incentives only when all the necessary fetal and maternal well-being follow-up sections are filled in properly. During the assessment process the woreda health experts and PBF verifiers provide intensive coaching and mentoring on various sections of the partographs. This explains the significant difference in the utilization and completeness levels between intervention sites where necessary coaching and mentorship on gaps identified on spot is provided and control sites.

Further research in Jimma is needed to understand the factors associated with utilization of partographs. The lack of well-designed and integrated programs, such as mentorship and supportive supervision, could be the cause of this difference [71]. Other factors that may contribute to lower partograph utilization include a lack of expertise, a lack of understanding, insufficient partograph training, and a negative attitude among study participants [71]. Other studies indicate that health workers do not always use the partographs due to various reasons including but not limited to lack of human resources, time of admission, knowledge and training, attitude, sex, low competence, lack of on-going facilitative supervision, acceptability of the tool and lack of functioning referral mechanisms [9, 30, 41, 42]. These challenges are usually the hindrance to the effective use of the partograph and lack of institutionalized policy to utilize partograph [9, 30, 41, 42]. While our study has confirmed improved partograph utilization and completeness with PBF implementation, further studies are needed to understand which specific levers are adjusted by PBF.

Conclusion

Incentivizing health facilities to improve quality of care coupled with coaching and mentorship of health workers by woreda experts and PBF verifiers is effective in improving quality of service for pregnant women in labor and delivery. This study revealed that the partograph utilization was significantly better in PBF intervention sites as compared to control sites. PBF challenges business as usual approach and encourage compliance to policies and guidelines to improve quality of care. Such compliance has been enforced to rigorous mentorship and coaching of health workers by the woreda experts and PBF verifiers. While utilization and completeness has improved in intervention sites, consistency still need to be emphasized. This study findings on utilization and completeness of partograph by the health workers has a critical value to inform the design of appropriate intervention strategies to improve provide quality maternity care.

Conflict of Interest

The author has no conflict of interest.

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An Analysis of the Media in the Generation of Electoral Conflict Behaviours among Voters in the Western North Region, Ghana

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Abstract

The study investigated the media in the generation of electoral conflict behaviours among voters in the Western North Region, Ghana. It sought to ascertain how the media generate electoral conflict behaviors among voters in the Western North Region and to suggest ways of minimizing such conflicts. The mixed research design was used in the study. Questionnaires and interview guides were used to collect data for the study. The study revealed that the media are to blame for generating conflicts among voters in the Western North Region through the promotion of 'hate-speech', biasness and false reportage, mudslinging, improper checking of facts, encouragement, and usage of unsavory language, as well as unprofessional conduct of some journalists. It was also revealed that respect and adherence to media ethics, the establishment of media watchdog committees, avoidance of biased reportage, provision of effective security before, during, and after elections, as well as discouragement of hate speech and avoidance of incessant verbal attacks, could prevent electoral conflicts generated by media in the Region. The study recommended that media owners, especially television and radio owners, should develop the capacities of their journalists to ensure that they fact-check their stories before publishing so as to reduce political tensions and tackle hate speech in the Region before, during, and after elections. Ethical journalism is encouraged.

Keywords: *Conflict, Election, Ghana, Media, Voters, Western North.*

Introduction

According to [1], the impact of media on conflict resolution is a relatively new topic that has gotten little attention due to a lack of multidisciplinary models and concepts that provide more insight into the function of media in peace and conflict. The vast majority of violent clashes are asymmetric, and the vast majority of them take place within state borders.

It's vital to remember, particularly in terms of the media's role, that winning people's "hearts and minds" is critical. Non-state actors rely more on psychological warfare, which entails influencing a population's attitudes and opinions, such as through the media because states are usually militarily superior [2]. Political decision-makers and the military, unfortunately, often underestimate the media's multidimensional role. Decision-makers regularly assert that the media has a huge impact. Political practitioners and even specialists typically presume that the media has an impact on political disagreements. According to a 1995 study, 64% of American military officers believed the media was mostly to blame for the Vietnam war effort's failure [3]. Given this, it's surprising, if not alarming, that so little research and funding has gone into better understanding the role of the media in

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armed conflicts and government democratization [3].

The media has been used to promote peace and reconciliation before, during, and after elections on several occasions. In Northern Uganda, for example, the media has been used to foster peace by promoting the common good for the people (primarily voters) [4]. Evidence also suggests that the media has a key role in encouraging citizens to vote in big numbers during elections. [4] continued, "voters are encouraged to listen to media stations for radio phone-in chat shows and to have regular conversations with government and civil society leaders, which is a positive step toward peace-building. In the areas of news broadcasting, special features, round-table discussions, telephone call-ins, and music, the hiring of an ethnically diverse team of journalists to produce high-quality radio programs that promote reconciliation, dialogue, and collaboration will ensure credibility and unbiased programming [5].

Contrary to promoting peace, [6] argued that the media could increase divisions by failing to reflect pluralism in social and political processes. This could be done by acting as a spokesperson for ethnic and political power circles, thereby assisting in the creation of a critical citizenry inside a country. As a result, [6] concluded that the deliberate manipulation of news coverage for specific reasons exacerbates tensions between opposing factions and is the main driver of violent conflict in democracies. This is an example of the media's persuasive ability to influence perceptions and decisions towards conflicts. The media has a history of inciting people to violence. Hitler exploited the media to incite anti-Semitism [7].

As [1] argued, not much work is done on the media, conflicts, and elections. This is particularly the case when relating the media and conflicts to voter behavior in elections, as literature search does not reveal much on such studies. It is against this backdrop that this study sought to ascertain how the media generate electoral conflict behaviors among voters in the Western North Region, Ghana, and suggest ways of minimizing such conflicts.

Objectives of the study

The study aimed to ascertain how the media generate conflict behavior among voters in the Western North Region of Ghana. It also suggests ways by which to deal with electoral conflicts generated by the media in the Region.

Literature Review

Empirically, local communities were splintered to the point where violence was recognized as a valid way of problem resolution [7]. According to the Office of the High Representative's (OHR) early evaluations of the Bosnian conflict, all three parties exploited radio and television programs to achieve their conflict goals and disparaged their opponents [8, 9]. On the African continent, there have been a few political revolutions in Arab countries. Viggo explored the role of the media in modern wars using the civil unrest in Libya as a case study [10].

The media's inadequacies in conflict reporting and analysis were highlighted, emphasizing the media's double standards by drawing parallels between the crises in Iraq and Libya to expose the media's numerous blunders. Even while the media utilized "oppositional metaphors" to split the country into rulers and political elites ("us" vs. "them"), the impact on socioeconomic status, gender, age groups, and other human factors was not openly highlighted.

During Côte d'Ivoire's general elections in 2010, the media environment was filled with political hyperbole, disinformation, and incitements to violence from opposing sides, while journalists were routinely assaulted and intimidated [11]. Both presidential candidates Laurent Gbagbo and Alassane Ouattara used the print media and public television to propagate propaganda and rally their electorates against their opponents during the post-election

unrest that followed the announcement of the presidential results [12]. The media played a key role in the post-election instability and subsequent civil war, which resulted in the displacement of over a million people, the effective termination of many government services in some areas, and a protracted period of economic deterioration [12]. The Ivorian civil war saw a power struggle for control of the media between factions supporting Gbagbo and Ouattara. The Ouattara camp founded Television Côte d'Ivoire (TCI) in early 2011 in response to the state-run Radio Télévision Ivoirienne (RTIpro- Gbagbo's) prejudices. Both television stations incited violence against their rivals and assaulted their opponents' media outlets or journalists. Certain media sources are largely regarded to have played a crucial part in the country's political, social, and ethnic problems [13].

In 2013, a sectarian atmosphere in the Central African Republic was worsened by hate speech propagated through the media, as well as targeted assaults, culminating in the displacement of about one million people and 75,000 refugees, which was unprecedented [14]. Hatred propagated through the media may have an impact that goes beyond prejudice to more overt expressions, such as the inter-ethnic conflict in the Democratic Republic of Congo [14]. The Rwandan Radio-Télévision Libre des Milles Collines had a key role in the genocide of 1994, which claimed the lives of over 500,000 people in less than 100 days. The genocide is said to have been assisted by radio broadcasts directly urging for the slaughter of the Tutsi people [15, 16]. In Uganda, the lack of media coverage of the fight between the Uganda People's Defence Forces (UPDF) and the Lord Resistance Army (LRA), which has lasted for more than two decades without being thoroughly chronicled, has been blamed for the violence in Northern Uganda [17]. As a result, interfering with the international community has been difficult. [17] accused the international media of failing to fully report on Rwanda's unfolding crisis, which led to the international community's failure to respond quickly. Okumu believes that more thorough and objective coverage of the Rwandan conflict could have prevented the genocide in 1994. Through misleading coverage, the media projected a chaotic political atmosphere characterized by abhorrence, violence, and a tight race between two protagonists in Kenya's 2007 general election.

Moreover, major news organizations such as NTV and KTN warned that the election would be rigged and tilted in favor of the ruling party. As a result, the Electoral Commission of Kenya's (ECK) alleged attempt to tamper with the vote-counting process only served to confirm the media's prediction [18]. When there is a lack of knowledge, tensions could rise [19, 20].

In Ghana, the 1992 constitution mandated that power be transferred every four years through elections. Ghana has managed to hold seven elections without interruption, including the 2016 elections. These elections exacerbated tensions between political parties, creating an unstable environment in which some individuals or groups are prone to participating in political and electoral violence on the smallest pretext or provocation, mostly fueled by the media [21]. Ghana has not had the same level of political or electoral violence as Cote d'Ivoire (2000, 2010), Nigeria (2003, 2007, 2011), Zimbabwe (2008), or Kenya (2007). However, since the Fourth Republic's foundation in 1992, grassroots violence or isolated incidences of electoral violence as a result of angry speeches or intemperate political rhetoric have become a recurring feature in Ghana's Presidential and Parliamentary Elections [22].

Methods

Research Design

According to [23], the research design is a detailed strategy for addressing a research challenge. "It is the plan, structure, and method

of investigation designed to get answers to research questions and control variance [24]. The study looked at how the media influence voting behavior in Ghana's Western North Region using quantitative and qualitative research approaches. Using the mixed research design, the researchers were able to examine the research problem from multiple perspectives, resulting in a more comprehensive understanding of the issues at hand [25].

Profile of the Study Locality (Sefwi Wiawso Municipality)

The Sefwi Wiawso Municipality was established in 1988. Both the Sefwi-Wiawso Municipal and the Western North Region have administrative offices there in Sefwi-Wiawso. To the north, it is bordered by the Brong Ahafo Region, which is located in the Region's north-eastern corner. Juaboso and Bia Districts are to the west, and Aowin/Suaman Districts are to the south. To the north and south, it is bordered by Bibiani-Ahwiaso-Bekwai and Wassa Amenfi, respectively. The Sefwi Wiawso Municipal Assembly is the political and administrative centre of the Municipality. The Assembly's offices are in Sefwi Wiawso. Sefwi Wiawso Municipal had a total population of 151,220 people as of the 2021 Population and Housing Census, with men and women accounting for 50.2 and 49.8% of the population, respectively [26]. The household population was estimated to be 147,162, with 41,513 households, according to the survey. The average household size is 3.5 individuals.

Figure 1: displays the Map of the Sefwi Wiawso Municipality of the Western North Region.



Figure 1. Sefwi Wiawso Municipal of the Western North Region

Source: Electoral Commission of Ghana Final compilation of voter population figures (2020)

Sampling Size, Data Collection, and Data Analysis

Questionnaires and interview guides were used to gather data for this investigation. Participants in the study were from the Sefwi Wiawso Municipality. The survey population included 65,497 persons aged 18 and up who registered and voted in the Sefwi Wiawso Constituency during the December 7, 2020, General Elections.

Yamane Formula,

$$n = \frac{N}{1 + N(e)^2}$$

It was used to calculate the sample size.

The sample size for the study is ***n*** number of people. Thus, the current voter population studied in the Region. ***N*** is the number of voter population in the area, where ***1*** *is a constant* number, and ***e*** is the margin of error. The formula used a 95% confidence level, and P =0.05 are assumed. Given this, the sample size was determined as follows:

$$n = \frac{N}{1 + N(e)^2}$$

Where n=the sample size.

N=the population size (65,497).

e=the margin of error (0.05).

Hence,

$$n = \frac{65{,}497}{1 + 65{,}497(0.05)^2} = 398$$

The convenience sampling strategy was used to select the sample for the questionnaire administrations. The technique allowed for the identification of voters who met the study's requirements. Those who agreed to participate in the study were picked. According to [27], if the cost of a probability sample is extremely high in relation to the type and quality of data gathered, a non-probability sample should be considered (1997, p.62). The questionnaires were administered to 438 eligible voters in total. To account for expected attrition, the sample was increased by 40 eligible voters (10% of 398). According to [28], oversampling decreases the impact of a high attrition rate on numerical analysis while simultaneously increasing the results' validity. At the end of the questionnaire administration, 404 questionnaires were retrieved and processed. The purposive sample method was utilized to choose 10 eligible voters for the qualitative segment interviews. To obtain qualitative data, according to [29], sampling should be done with purpose. Purposive sampling enabled the researchers to select the optimal sample for collecting the data required. Both convenience and purposive sampling methods were used in this investigation. Data were analyzed and discussed at the same time. The survey data were entered into Excel and structured into tables, charts, and graphs. For emphasizes, data from the interviews were presented in narratives and direct quotations. The findings were then discussed.

Results and Discussions

The age and educational level of respondents were analyzed as important variables in the study. Findings on the study objectives were also presented and discussed here.

Table 1. Ages of Respondents

Valid	**Frequency**	**Percent**	**Valid Percent**
18 – 25 years	59	14.6	14.6
26 – 35 years	150	37.1	37.1
36 – 45 years	173	42.8	42.8
46 years and above	22	5.4	5.4
Total	404	100	100

Source: Field Data (2021)

According to Table 1, 42.8 % of the sampled respondents were between the ages of 36 and 45. Respondents between the ages of twenty-six (26) and thirty-five (35) years made up 37.1% of the sample, while those aged eighteen (18) and twenty-five (25) years, as well as those aged 46 and over, made up 14.6% and 5.4%, respectively. [30] argued that voters' perspectives on specific topics are shaped in part by their age. Diverse age groups may have different opinions on issues, including the media and electoral conflict behaviors.

Table 2. Educational Level of Respondents

Valid	Frequency	Percent	Valid Percent
Primary	0	0	0
JHS	13	3.2	3.2
SHS	123	30.4	30.4
Tertiary	264	65.3	65.3
No Education	4	1	1
Total	404	100	100

Source: Field Data (2021)

Table 2 shows that 3.2 % and 30.4% of respondents, respectively, completed Junior High School (JHS) and Senior High School (SHS). As shown in the Table, the majority (65.3%) of the study respondents had completed university education at the time of voting, while only 1% (4) had no formal education. This reveals that the majority of respondents (65.3%) in the study Region had tertiary qualifications, indicating their level of appreciation of issues, including the problem under study, and hence their ability to provide the needed data. The Media and Generation of Electoral Conflicts Behavior among Voters in the Western North Region.

Media Personnel Promote Hate Speech during Elections

The study sought to establish whether media personnel promote hate speech during elections, and Figure 2 provides data in support of the argument.

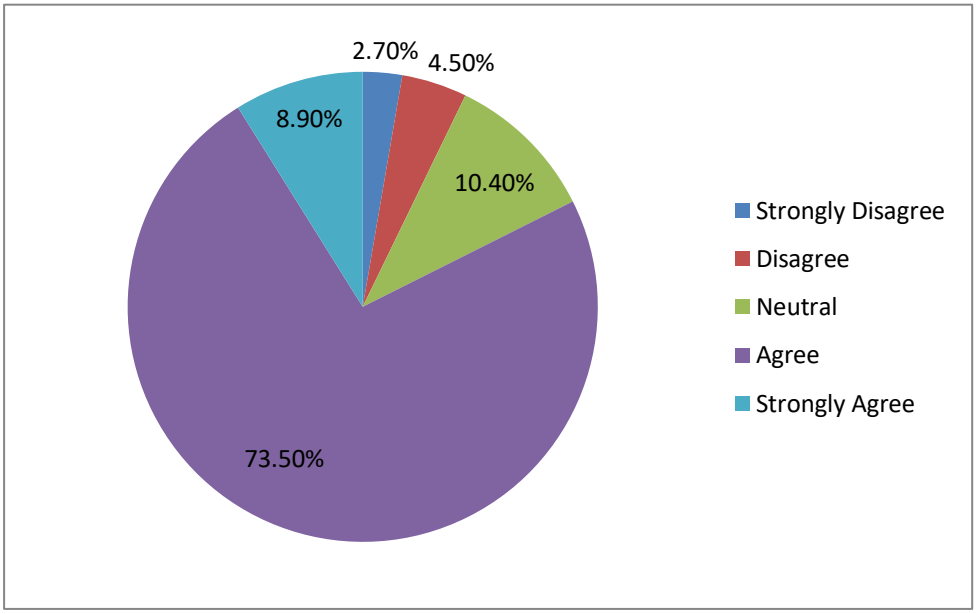

Figure 2. Media Personnel Promote hate Speech during Election

Source: Field Data (2021)

Data in Figure 2 provides insights into the sampled respondents' level of agreement regarding the promotion of hate speech during elections by media personnel. From the study, the majority (73.5%) of the respondents agree and strongly agree (8.9%) that media personnel promotes hate speech during elections, whereas 4.5% and 2.7% disagree and strongly disagree, respectively. About 10.4% remain neutral on whether they agree or disagree with the claim.

This finding on media professionals encouraging hate speech during elections (73.5%) is consistent with Ebenezer Wikina's assessment at a panel discussion on "a youth-led open-source forum for policy ideas" that certain journalists were being utilized to propagate hate speech in society [31]. It was further asserted during the interview that hate speech targets, threatens, or degrades an individual or group, as well as inciting violence in society. While informing, educating, entertaining, and setting the agenda for public conversation, the media must guarantee that it does not advocate or promote hate speech leading to conflict or violence in society. This is why we recommend media owners engage in journalist capacity building so that they can fact-check stories, combat hate speech, and lessen political tensions [31].

Corroborating the hate speeches by journalists as one of the causes of electoral conflicts by the media, one of the study participants recounted this: *"Some of the media comments poured out for public consumption during elections are undignified, dehumanizing and above all frightening. These comments result in enflaming violence in some communities" (Interviews, 2021).*

The Media Tend to Favor Some Candidates Over Others During Elections

This research sought to determine whether the Media tend to favor some candidates over others during elections or not. Figure 3 illustrates the results obtained from the sampled respondents.

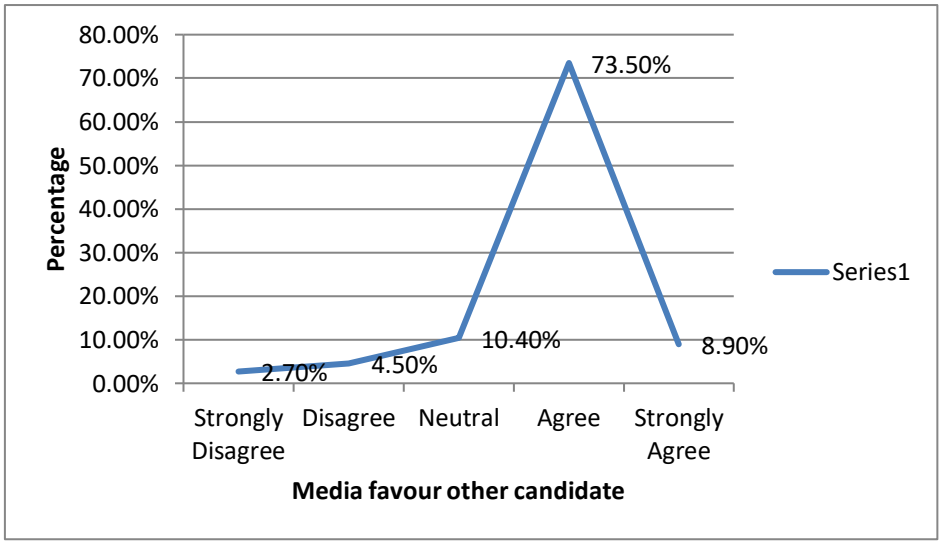

Figure 3. The Media Tend to Favour some Candidates over others during Elections

Source: Field Data (2021)

According to the findings of the survey, the majority (73.5%) and 8.9% of the sampled respondents agree and strongly agree that the media favors some candidates over others during elections, compared to a few (2.7%) and 10.4%) who disagree and strongly disagree. This finding is corroborated by a similar outcome by [31], who observed that almost eight out of ten Americans (79%) believe news media favor one side when reporting on political and social topics. In supporting how the media tend to favor some candidates over others, one respondent stated that:

This is when party communicators are given opportunities to speak out against rival political parties in an unacceptably hostile manner in our culture. When the opponent hears this, they may respond by assaulting

them, resulting in conflict in our society by their party supporters (Interviews, 2021).

The Media make Biased and False Reportage on Political Parties and Politicians During Elections

The study sought to establish whether the media make biased and false reportage on political parties and politicians during elections, and the result of this is shown in Figure 4.

Figure 4 indicates that the majority (76.2%) as well as 8.9% of the sampled respondents correspondingly agree and strongly agree with the statement that the media make biased and false reportage on political parties and politicians during elections, while 5% and 2.2% disagree and strongly disagree respectively.

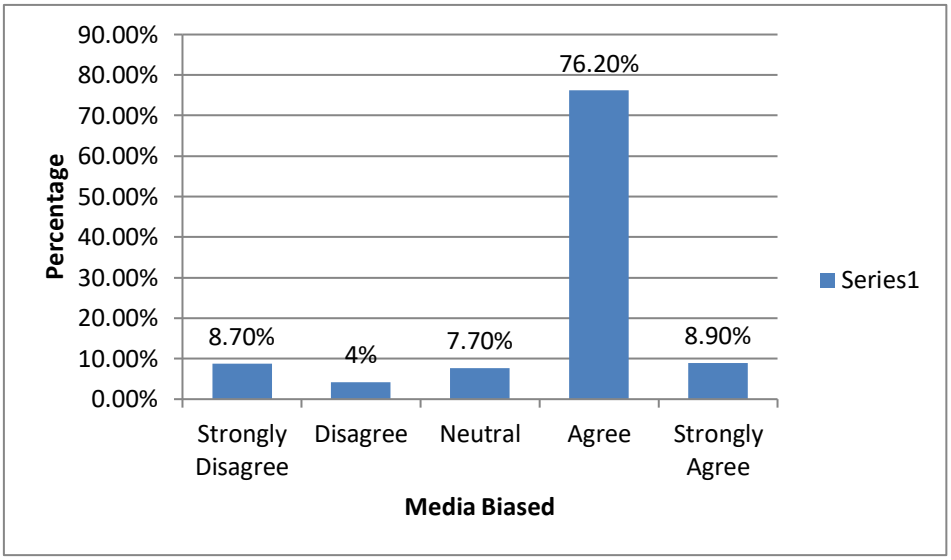

Figure 4. The Media make Biased and False Reportage on Political Parties and Politicians during Elections

Source: Field Data (2021)

The remaining 7.7% of them remained neutral. The findings in this regard were similar to the work of [32], who stated that the media biasness and falsity have also been used in politics to smear the free press for revealing embarrassing truths or speaking "truth to power". The Oxford Internet Institute's (OII) algorithmic propaganda project uses the umbrella term 'junk news,' which is characterized as "extremist, sensationalist, conspiratorial, disguised commentary" [33]. "Problematic information", "information disorders", and "fake news" are among other catch-all terms [34]. Corroborating the biased and false reportage made by the media, one interviewee said:

The media generate conflicts among voters by speaking for one particular person or throwing out wrong information on a candidate during campaigning sessions without speaking for the other people because they don't give equal room to the participants to campaign on their platforms, and this creates conflicts during the election (Interviews, 2021).

The Media Create an Atmosphere of Disunity, Mudslinging, and Animosity among Political Parties and Politicians

The study sought to establish whether or not the media create an atmosphere of disunity, mudslinging, and animosity among political parties and politicians in the study area. Data in Figure 5 present results regarding the creation of an atmosphere of disunity, mudslinging, and animosity among political parties and politicians by the media.

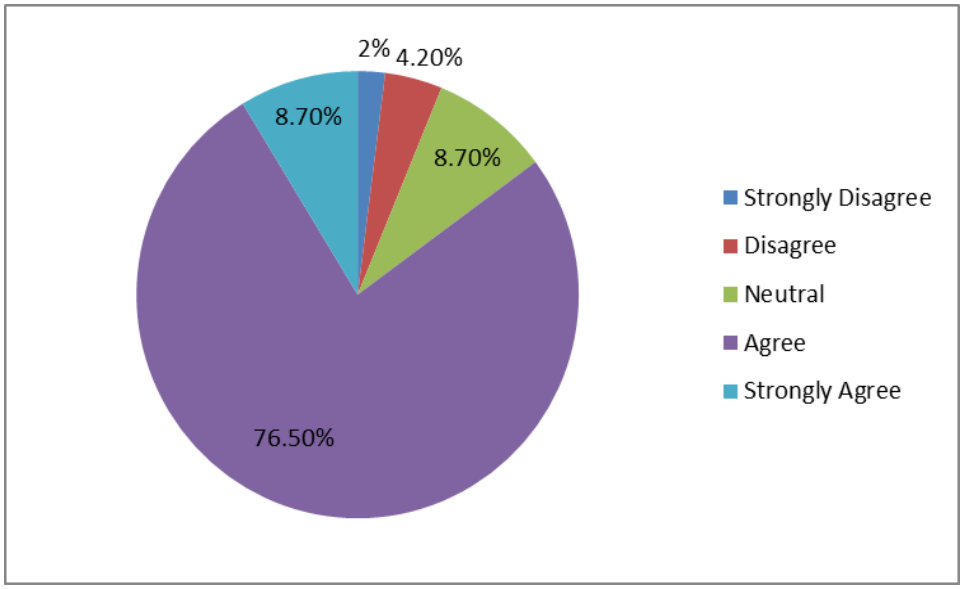

Figure 5. The Media Create an Atmosphere of Disunity, Mudslinging and Animosity among Political Parties and Politicians

Source: Field Data (2021)

The study investigated into the creation of an atmosphere of disunity, mudslinging, and animosity among political parties and politicians by the media. It was discovered that the majority (76.5%), as well as 8.7% of the sampled respondents correspondingly agree and strongly agree with the assertion that the media create an atmosphere of disunity, mudslinging, and animosity among political parties and politicians, while 4.2% and 2% disagree and strongly disagree in that order. It was observed that 8.7% of the study participants remained neutral in responding to the claim. This finding supports the work of [35], who views the creation of an atmosphere of disunity, mudslinging, and animosity among political parties and politicians as the doing of when covering political events, journalists have a tendency to exaggerate negativity, assaults, and disputes. The finding is also consistent with the views of [36]. Journalists are getting more cynical about politics), or they want to attract more viewers/readers, therefore they strive to sell excellent stories with conflicts [36]. According to [37], there is a correlation between rising negativity in politics and the media. A respondent in an interview stated that:

The media generate conflicts through personal verbal attacks, muggings, needless quarrels, and embellishment of political issues on opponents. These verbal attacks in a way have the tendency of angering their victims and thereby result in clashes among people from different political party divides insults and lies about the opponents (Interviews, 2021).

The Media Do Not Do Fact-Checking of Polls and Other Information They Churn out During Elections Thereby Creating Conflicts

The goal of the study was to ascertain if the media contributes to conflict by failing to fact-check polls and other materials they disseminate during elections. Figure 6 shows the effects of not fact-checking polls and other materials that are churned out during elections, which leads to conflict.

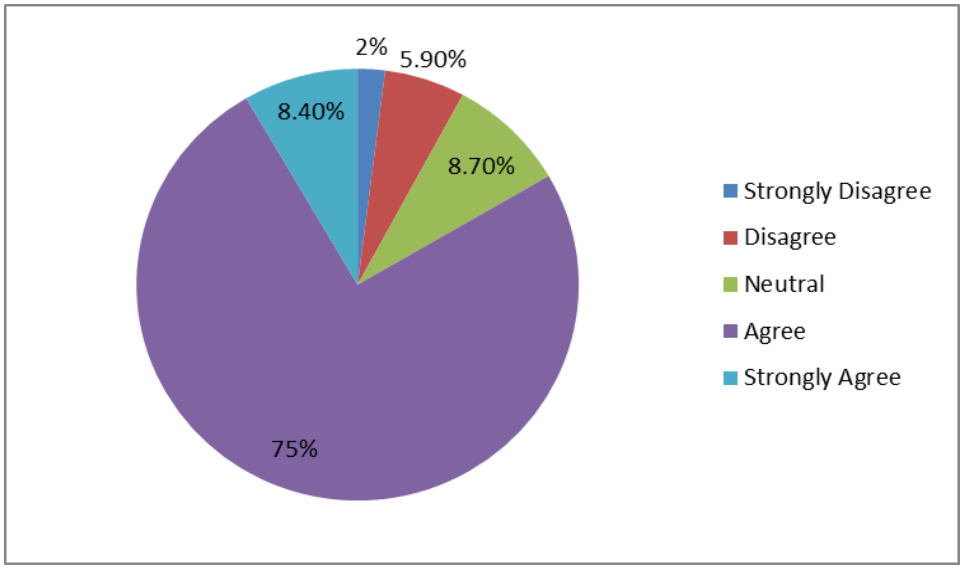

Figure 6. The Media do not do fact-Checking of Polls and other Information they Churn out during Elections thereby Creating Conflicts

Source: Field Data (2021)

The research looked at the idea that during elections, the media does not fact-check polls and other information they spew out, resulting in disputes. It was revealed that the majority (75%) and 8.4% of the sampled respondents agree and strongly agree with the premise that the media does not fact-check polls and other material they churn out during elections, resulting in disputes.

It was also discovered that 5.9% and 2% of the individuals disagree and strongly disagree with the assertion, respectively. Approximately 8.7% of the remaining respondents were undecided. It can be implied from the data presented in Figure 5 that it is critical to keep erroneous information under wraps, especially because it has the ability to disrupt and derail existing peace being enjoyed by the populace [38]. An Interview was done with one of the respondents on how media generate conflict during the election without doing proper fact-checking and the respondents remarked as follow:

The media generate conflicts through their talk shows and debates. During such debates, hosts of the programs do not do proper fact checking by putting out flawed information under shawls. Such information eventually goes along way to defaming a candidate or the personalities of their opponents and this results in attacks on them by political party members in their various localities (Interviews, 2021).

Ways Media Generate Conflicts Among Electorates in the Western North Region

The goal of the study was to figure out how the media in the Western North Region causes electoral conflicts. The responses in Table 3 depict the many ways in which the media contribute to electorate conflicts in the Western North Region.

Table 3. Ways Media Generate Conflicts among Electorates in the Western North

Item	Frequency	%
Bias in reporting	36	10
False reportage	53	13
Unguided utterance	36	9
Unfair constitution of panel members	44	11

When the media create a conducive environment for one party than others	4	1
Inability of media to do proper fact-checking	36	9
Misbehavior by some party members at panel discussions	40	10
Unprofessional behavior of some journalists	4	1
Unnecessary bastardization of parties	4	1
Unresolved issues among parties created the media	77	19
Encouragement and use of unsavory language	50	12
Political ideological differences arrogantly expressed via the media	20	4
Total	**404**	**100**

Source: Field Data (2021)

The findings from Table 3 reinforce [39] position, which contended that community radio may be a double-edged sword, used to communicate negative objectives that might disrupt a cohesive society, thus inciting violent disputes, by broadcasting intolerant words and falsehoods that generally influence residents to choose violence over peace. A classical case has been cited by [33] who reported that the 2007/2008 election violence in Kenya was mostly blamed on community radio stations that broadcast in the Vernacular. Similarly, in the case of the study area (Sefwi Wiawso Constituency in the Western North Region), community radio stations also broadcast in Local Languages for the digestion of the indigenous folks. Information disseminated through them carries heavy weight leading to election-related conflicts as a result of biased reportage, misinformation, false news, the inability of media to do proper fact checking, unprofessional behavior of some journalists, and encouragement and use of unsavory language, among others.

Ways of Dealing with Electoral Conflicts Generated by the Media in the Western, North Region

Provision of Effective Security Before, During, and After Elections can Prevent Conflicts Generated by the Media

The sampled respondents through a close ended questionnaire were asked to show their level of agreement on whether the provision of effective security before, during and after elections can prevent conflicts generated by the media in the study area.

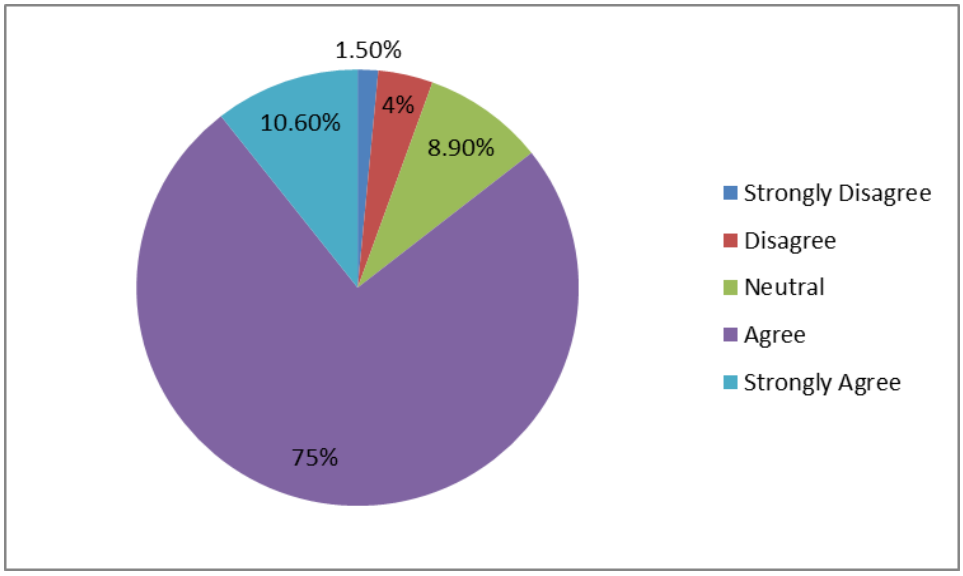

Figure 7. Provision of Effective Security before, during, and after Elections can Prevent Conflicts Generated by the Media

Source: Field Data (2021)

From the data obtained in Figure 7, 75% and 10.6% of the sampled respondents respectively agree and strongly agree that effective security before, during, and after elections can help to avoid media-driven disputes. However, 4% and 8.9% of them disagree and strongly disagree, respectively with the assertion. Policy makers on Security should be able to make well-informed decisions about how to create a peaceful atmosphere by deploying early security warning systems and personnel appropriately and educating the media about how their activities may cause violence. Media professionals should be urged to follow established regulations and ethical standards that govern the industry's behavior [39]. An interviewee in the Region stated this as a response.

Conflict can be prevented in the Western North Region during elections by ensuring effective operations by law enforcement agencies. In this, I mean providing effective security personnel before, during, and after the election in some flagships point areas to deter any ensuing violence in the Region (Interviews, 2021).

The Institution of Media Watchdog Committee During Elections Will Help Prevent Conflicts Generated by the Media

The study investigated the claim that the institution of a media watchdog committees during elections will help prevent conflicts generated by the media. Figure 8 illustrates the results from respondents on this claim.

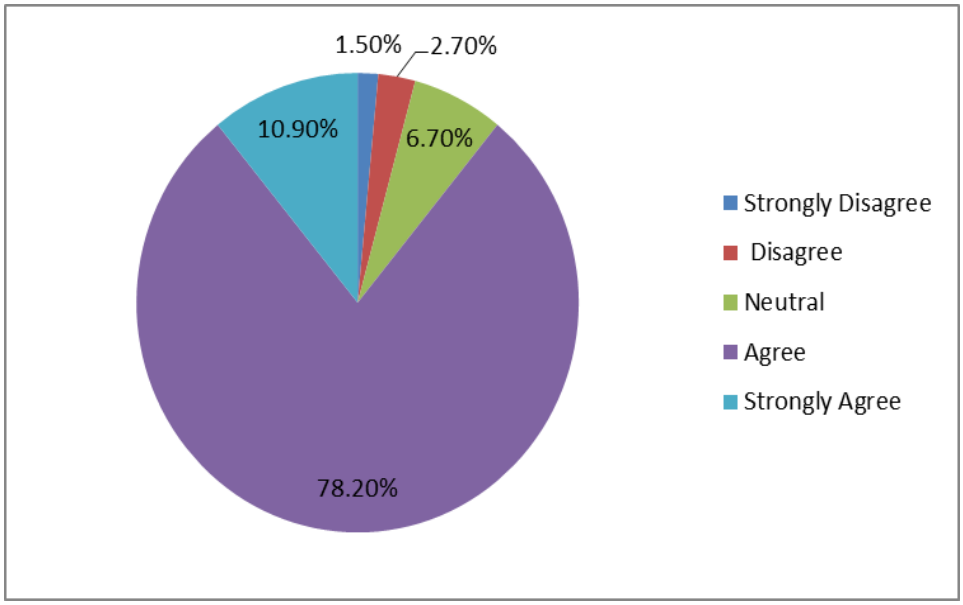

Figure 8. The Institution of Media Watchdog Committee during Elections will help Prevent Conflicts Generated by the Media

Source: Field Data (2021)

From Figure 8, it was revealed that the majority (78.2%), as well as 10.9% of the sampled respondents, respectively agree and strongly agree with the assertion. It was also observed that 2.7% and 1.5% of the participants correspondingly disagree and strongly disagree with the claim that the institution of a media watchdog committee during elections will help prevent conflicts generated by the media. About 6.7% of the remaining respondents remained neutral. It can be inferred from this finding that in modern politics and culture, the media is critical to maintaining democratic process transparency. This is known as its "watchdog" function [40]. In an interview, an interviewee said this:

Institution of watchdog committees will help prevent conflict generated by the media by ensuring that responsible behavioral standards, ethics, and codes of conduct will be outlined to media industries for strict adherence and conformity during electioneering period. And I am sure when this is done, the rate at which the media create conflict during elections can be minimized (Interviews, 2021).

Avoidance of Biased Reportage by Churning Out Accurate Information Will Prevent Conflicts Generated by the Media

The study investigated the claim that preventing biased reporting by churning truthful data will reduce media-related conflicts as shown in Figure 9.

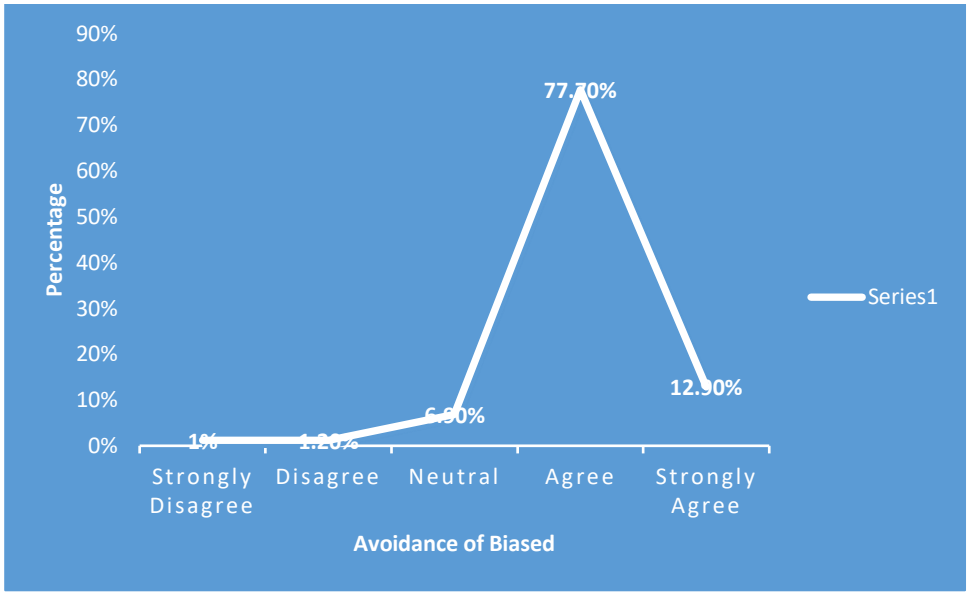

Figure 9. Avoidance of Biased Reportage by Churning out the Accurate Information will Prevent Conflicts Generated by the Media

Source: Field Data (2021)

Data in Figure 9 revealed that most (77.7%) and 12.9% of the sampled respondents agree and strongly agree respectively that by avoiding biased reporting and putting out reliable data, the media will less likely cause disputes. This finding has been emphasized by [41] that by abstaining from employing terms and phrases that stereotype parties in a dispute, the media can contribute more to crisis de-escalation. The study also revealed that 1.2% of the study participants each disagreed and strongly disagreed with the claim, in addition to 6.9% who chose to remain neutral. In supporting the remedy for biased reportage churned out by the media, a respondent interviewee said:

The media should be regulated or have some rules and regulations for panel members. The hosts of programs must monitor their activities and comments throughout their programs by ensuring that information put out contains facts and enough background checks done to ensure they are devoid of inaccuracies and falsity (Interviews, 2021).

Discouragement of Hate Speech and Avoidance of all Forms of Incessant Verbal Attacks by the Media will Prevent Electoral Conflicts

The study sought to ascertain whether if hate speech is discouraged, and the media avoided all sorts of constant verbal attacks, it would prevent media-generated disputes before and during elections. The result of this is reported in Figure 10.

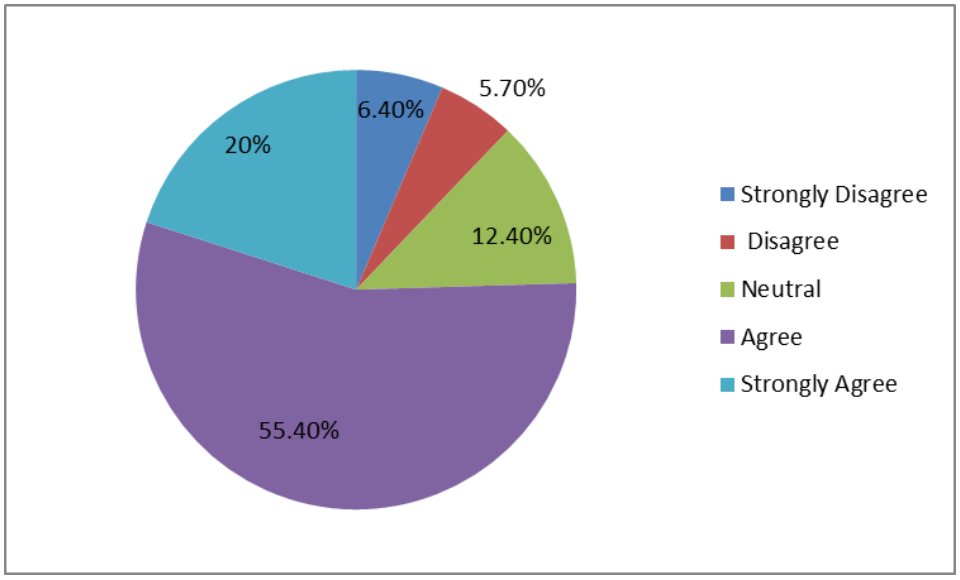

Figure 10. Discouragement of Hate Speech and Avoidance of all Forms of Incessant Verbal Attacks by the Media will Prevent Conflicts Generated by the Media during Elections

Source: Field Data (2021)

From Figure 10, the study revealed that most (55.4%) and 20% of the study participants agree and strongly agree correspondingly that media-generated controversies will be prevented before and during elections if hate speech is prohibited and the media avoids all kinds of relentless verbal assaults. Contrarily, 5.7% and 6.4% of the respondents disagree and strongly disagree, respectively, with the claim, with 12.4% remaining neutral. Thus, beyond its conventional functions of informing, educating, and entertaining, the media serve as an interactive platform for political parties and the voters in a democratic process, allowing for democratic election by ensuring a peaceful atmosphere and co-existence [42] if well managed. One of the participants in the interviews recounted this:

There should be a guideline that directs the hosts and panelists that are invited to their different studios on how to communicate their thoughts without using hate speech or launching personal attacks. This in a way, can bring media sanity to political space by creating violence-free speeches to all listeners and hence avoid conflict among political parties' members in various places (Interviews, 2021).

Conclusions and Recommendations

The use of the media in politics is on the rise. The study found that some journalists are being used to fuel electoral conflicts. The study revealed that the media is to blame for promoting hate speech in favor of one candidate over others, producing biased and false reporting on political parties or politicians, mudslinging, failing to conduct fact checks, the unnecessary bastardization of parties, encouraging and using unsavory language, and unprofessional behavior of some journalists during elections which contribute to electoral conflict behavior among voters in the Western North Region of Ghana. The study concluded further by encouraging media personnel to respect and adhere to the industry's established norms and ethical standards, establishing media watchdog committees during elections, avoiding biased reporting, establishing legislative frameworks to regulate media content, and deploring security agencies to enforce serene and tranquil atmosphere before and during elections can help prevent potential

electoral conflict behaviours of voters triggered by the media.

The study recommended that owners of media establishments, particularly television and radio stations, should invest in the capacity development of their journalists to ensure that they fact-check their stories before publishing to reduce political tensions and combat hate speech in the study area before, during, and after elections. Also, security officials should be able to make well-informed judgments on how to foster a peaceful atmosphere, such as implementing early warning systems and educating the media about how their activities may contribute to violence to reduce contradictory circumstances in our body politics. More so, journalists should be trained to acquire more knowledge on media operations and conflict management as well as advancement in peaceful journalism on the need to avoid media-generated conflicts.

Acknowledgment

We would like to express our gratitude to all those who contributed to making this study a reality.

Conflict of Interest

In relation to this paper, there is no potential conflict of interest.

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Exploring the Understanding of Technical University Lecturers on Continuous Professional Development in Ghana

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Abstract

The main objective was to determine the understanding of technical university lecturers in Ghana on continuing professional development and the importance it plays in their career prospects. The study was qualitative with a sample size of forty-eighty. The sample was taken from six deans of faculties, six heads of departments, and thirty-six lecturers. The participants were chosen from two technical universities. Two interview schedules were used to interview the participants. The deans and heads were interviewed with a different schedule, and the other was used to interview the lecturers. Some of the research findings included that CPD is any training, activity, or program that improves one's knowledge, competencies, and skills in their field of specialty. It was also revealed that CPD allows lecturers to develop themselves. The ultimate objective of CPD is to help lecturers be efficient and effective in their teaching to impact their students positively. The study recommends that lecturers above fifty years who do not qualify for study leave with pay to embark on terminal degrees but certify all the criteria for promotion be promoted not above the senior lecturer position.

Keywords: *Career prospects, Competencies, Knowledge, Professional Development, Skills.*

Introduction

Continuing professional development is essential in any profession. Regarding academics, CPD plays a crucial role as lecturers must always be abreast with current trends in the field of expertise. Lecturers should always have to train their students to fit into real work situations. Therefore, lecturers must always upgrade their knowledge, competencies, and skills to stay relevant in this technological world. This makes it imperative for them to embark on continuing professional development. The technical universities have tied career prospects to CPD. In this study, we will explore the understanding of technical university lecturers in Ghana on professional development. We would also find how their professional development needs are identified and how they sponsor their CPD programs. The study will also determine if lecturers' career prospects are linked to CPD.

Jaafar [1] asserts that lecturers are expected to embark on continuing professional development to help enhance their knowledge and skills in teaching and learning approaches and managerial and leadership skills in an academic setting. He further asserted that CPD, in its broadest sense, encompasses all those activities that help faculty members improve their capacity to become more effective instructors. The other benefits of CPD help academics perform different parts of their multifaceted tasks, such as conducting research, contributing to administrative activities, and writing publishable materials. Wilkenson [2] underscores that CPD is a tool for improving the educational vitality of our institutions. This is done by giving attention to individual teachers' competencies to satisfy the institutional policies required to promote academic excellence. Jaafar [1] asserts that when lecturers realize and identify their strengths and weaknesses, it helps them select their most

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appropriate learning pathways. Lecturers should not see CPD as punishment or a remedial measure for mistakes but rather regard it as an intellectual challenge and for them to undertake new roles and responsibilities in their institutions. When the individual lecturer seeks to contribute to the learning and development of peers, it will help to enhance the functioning of the whole team and contribute to institutional knowledge and excellence.

King [3] asserts that continuing professional development is high on the agenda for UK Higher Education. It must be stated that it is valued not only in UK Higher Education that CPD is valued but also in academic circles. The government's White Paper issued in 2003 on 'The Future of Higher Education' underscored the need to support the development of professional standards for academic practice and continuing professional development (CPD). It will go a long way to support teaching and learning in higher education [4]. King [3] also stated that UK higher education institutions must develop their Human Resource and Teaching & Learning strategies to include provision for rewarding excellent teaching and supporting CPD. Becher [5] indicated that professional learning takes many forms. He identified seven categories or modes of continuing professional development: courses and conferences, professional interactions, networking, and consulting experts. The rest are personal research, learning by doing, and learning by teaching. Becher [5] further suggested that higher education institutions could set up professional interactions, promote and underpin specialist networks and support personal research.

Ferman [6] identified CPD to include various collaborative and individual activities. These activities include working with an educational designer, attending workshops, discussions with peers, presenting at conferences, being mentored, and undertaking professional reading. On his part, Baume [7] suggests that for any person to make the right developmental opportunities, the person should know the way he/her prefers to learn. Baume [7] outlines some of the opportunities available for academics, and it includes attending 'courses and workshops, conferences, mentoring, action learning sets, reading, discussions with colleagues, learning by doing and reflection, and development through committees, working groups, professional work, job shadowing, and exchange'.

Methodology

The researcher chose two technical universities out of the eight universities. One Technical University was purposively selected from the southern and the northern sectors. The chosen universities are Accra Technical and Kumasi Technical universities and can perfectly represent all the technical universities in the country. In each of the selected universities, the lottery method was used to choose three faculties and three departments in each selected faculty. In each University, the three deans of selected faculties were purposively appointed, and one head of department was selected from each faculty using the lottery method. The lottery method was used in each department chosen to determine two lecturers. Any lecturer employed for less than six years was eliminated from the sample. At each University, three deans, three heads of departments, and eighteen lectures. In all, the sample size included six deans, six heads of departments, and thirty-six lecturers who were selected for the study. All the forty-eight in the sample were interviewed using an interview schedule. Two interview schedules were used; one was used to question the deans and heads of HOD and the other for the lecturers. The interviews were thematically analyzed and discussed.

Results

The study revealed that the participants understood what constitutes continuous professional development. They understand CPD to be any training, activity, or program that improves one's knowledge, competencies, and

skills in their field of specialty. CPD allows lecturers to develop themselves. The ultimate objective of CPD is to help lecturers to be efficient and effective in their teaching to impact their students positively.

It also came out from the study that CPD constitutes any form of education and training, and it can be formal or informal, private or public, and can last for a few days and up to three/four years. CPD includes attending programs at accredited institutions that give certificates or attendance certificates. It also includes attendance of seminars, workshops, and conferences to make presentations, mentorship, and industrial attachments.

The study revealed that before any lecturer undergoes a CPD program, the professional needs of the lecturer should be identified by the head of department/dean of faculty or the lecturer himself. Sometimes the Quality Assurance (QA) section of the University assesses the professional needs of the whole University. The Quality Assurance section then informs the university authority to organize a conference for the university staff, both the academic and the non-academic. The conference usually takes between three to five days. The QA section identifies experts internally from the nation or outside the nation as resource persons.

The study revealed that the University has a scholarship fund, and those who identify any CPD program which they would like to attend apply through the head of the department and the dean of the faculty to the scholarship and conference committee for consideration. As the universities were upgraded from existing Polytechnics, most lecturers do not have Ph.D. degrees, so priority is given to lecturers who would like to pursue Ph.D. programs. Those who are not given sponsorship can be given the option to sponsor themselves if they have the means. It came out from the study that the University puts a premium on those who would like to pursue Ph.D. programs as those without Ph.D. degrees cannot be promoted if even they meet the criteria for the promotion. The University also prioritizes any CPD that can improve the lecturer's knowledge, competence, and skills to be efficient and effective in the classroom to impact the students positively. The University's policy is to organize at least one in-house seminar/conference once a year for the University's staff to be competitive in the academic world.

Discussions

What is your Understanding of Continuous Professional Development?

The first question explored the participant's understanding of continuous professional development. The analysis of the responses indicated that all of the respondents (100%) understood what is meant by the term Continuous Professional Development (CPD). We cite some of the responses given by the three categories of respondents to explain their understanding of the term CPD. These categories are lecturers, heads of departments, and deans of faculties. On the part of the lecturers, one respondent responded that:

Per my understanding, it depends on the department you find yourself in. For instance, I am in the marketing department; therefore, if I want to look at CPD, it means I should be able to develop myself in the profession I find myself in. So, in a sense, CPD is any training that will improve my marketing profession. (PL1, 2021. Lecturer).

On the same question, a head of the department also responded that:

Continuous professional development means that after your appointment, any education and training one receives would help them to upgrade and get abreast with the trends in their field. My understanding of CPD is a core part of human development for forward-looking firms. What CPD does is that it allows the lecturer to develop self. PH 1, 2021).

The views expressed by the two people above on the understanding of Continuing professional development collaborate with the idea of Roscoe [8]. He sees CPD as a process rather than a

product as it has no end. Blackwell and Blackwell [9] assert that all well-established universities provide continuing professional development opportunities for their staff. As time evolves, continuing professional development is becoming an inherent part of academia [10]. Higher Education Academy, on its part, has defined continuing professional education as any process or activity, planned or otherwise, that contributes to increasing or maintaining knowledge, skills, and personal qualities related to learning and teaching and broader academic practice. This includes proper research and scholarly activity and the leadership, management, and administration of academic provision and support [11].

What Constitutes Continuous Professional Development?

On the above question, the majority of the respondents (96%) had an idea of what constitutes CPD. The summary of the views expressed by the respondents indicated that any activity that helps lecturers to gain knowledge, skills, and competencies forms part of CPD. They also cited some of the activities that form part of CPD including attending conferences, workshops, industrial attachments, and conducting and publishing research results. We cite some of the responses given by the three categories of respondents to illustrate their understanding of what constitutes CPD. A lecturer responded that:

CPD comprises a series of training and activities such as formal education in an accredited institution for certification; it also includes a short course that may attract a certificate of attendance. It also includes attending seminars and workshops and going for industrial attachment, mentorship, or any formal or informal training, which updates the lecturer's knowledge, competence, and skills (PL 3, 2021).

On the same question of what constitutes continuous professional development (CPD), one head responded that:

When we talk about what constitutes CPD, a head of the department expressed the view that it includes seminars, publishing of articles, attending conferences, and attending workshops. It could be attending short courses, distance, sandwich, or on-campus programs. These courses can earn an academic certificate or certificate of attendance. Moreover, industrial attachment can be classified as part of CPD. In short, any exercise was undertaken by a lecturer to upgrade their skills, knowledge, and practical experience form part of CPD. (PH 2, 2021).

The respondents are of the view that CPD includes seminars, attendance, and presentations at conferences, workshops, and industrial attachments. CPD can be a short course or a full-time program, attracting either a certificate of attendance or an accredited certificate. In fact, any activity that gives knowledge, skills, and competencies to a lecturer can be classified as CPD.

According to Ferman [6], CPD includes a wide range of collaborative and individual activities. He believes that CPD activities involve working with an educational designer, attending workshops, discussions with peers, presenting at conferences, being mentored, and undertaking professional reading. Baume [7] suggests that for any person to make the right developmental opportunities, they should know how they prefer to learn. Baume [7] outlines some of the opportunities available for academics, and it includes attending 'courses and workshops, conferences, mentoring, action learning sets, reading, discussions with colleagues, learning by doing and reflection, and development through committees, working groups, professional work, job shadowing, and exchange'.

All the views expressed by the participants are similar to the responses of the head of the department above. These views collaborate with what Jaafar [1] said about what constitutes CPD. Jaafar [1] asserts that lecturers are expected to embark on continuing professional development

to help enhance their knowledge and skills in teaching and learning approaches and managerial and leadership skills in an academic setting. He further asserted that CPD, in its broadest sense, encompasses all those activities that help faculty members improve their capacity to become more effective instructors.

Lecturers are Allowed to Embark on CPD of their Choice

On the question of who determines a type of continuous professional development, a lecturer embarks on. All the respondents (100%) responded that the lecturer, the head of the department, and the quality assurance unit of the University could identify the professional development needs of the lecturer and imitate the process. However, the final approval should come from the committee in charge of scholarships and conferences. The quality assurance unit at times organizes conferences at the University to meet the professional needs of the lecturers. The sample responses given by the three categories of respondents are cited below. A dean of faculty responded that:

Students assess all lecturers at the end of each semester, and the outcome of students' assessments and the assessment by the head of the department help in the determination of the professional needs of the lecturer. The head of the department, with the consultation of the dean, recommends the type of CPD a lecturer should embark upon. A lecturer on his own can assess his professional needs and ask permission to embark on CPD of his own. Those without tertiary/terminal degrees are also recommended to pursue their Ph.D. In a sense, the head of the department or an individual lecturer can seek permission to undertake the CPD of his choice. (PD 2, 2021).

A head of the department also said that:

At departmental or faculty/academic board meetings, the general needs of the department/faculty or the University are identified, and a continuous professional program is organized for all lecturers. The University is supposed to organize CPD programs twice a year. That aside, a department or faculty can also organize CPD programs for the faculty or department members. At first, departments were attending academic retreats to sharpen faculty members' research needs and skills, but this has ceased due to financial constraints. (PH 6, 2021).

A lecturer also had this to say on who determines the type of CPD one can embark on and who determines the CPD needs of a lecturer. A lecturer responded that:

A lecturer on his own can identify a conference and would seek permission to attend the conference. Moreover, it is not always that a lecturer has to seek permission to embark on CPD. Many lecturers on their own embark on CPD; aside, the department, faculty or the University could determine the CPD needs of lecturers and either organize or sponsor lecturers to attend. (PL 13, 2021).

From the discussions above, the respondents expressed that either the individual lecturer or the University can identify the CPD need of the lecturer. When the CPD need of the lecturer is placed, either can initiate the process to embark on the CPD program. The University can organize CPD programs in-house to satisfy the professional needs of the lecturers in the institutions. An individual lecturer can identify a plan and seek permission from the university authority to attend, fulfilling his professional need. The University can fully sponsor the lecturer to embark on CPD; it could be shared with the lecturer or solely supported by the lecturer.

Whitehouse [12] believes that "CPD should be driven by identifying the learning needs" of the learner. Students can identify their learning needs through the assessment of lecturers by students, the lecturer himself, his colleagues, or the administrative head. According to Whitehouse [11], there should be needs identification before any person embarks on CPD. According to him, there should be some settings to audit the lecturer's developmental

needs, often derived from appraisal data. When a person's needs are identified, then the most appropriate CPD training could be organized to meet the person's needs.

What does your Institution Expect from you in Terms of CPD?

When the question was posed on what the University expects from lecturers in terms of CPD, all the respondents (100%) replied that the University expects that all those who embark on CPD programs would improve upon their knowledge, skills, and competencies. The University expects that lecturers who embark on CPD will be efficient and effective facilitators and will impact positively on their students. Some of the responses of the respondents are cited below for a better appreciation of their responses. One head responded that:

The University expects that any lecturer who embarks on CPD would improve upon his/her knowledge, skills, and expertise. The expectation is that any lecturer who undertakes a CPD program would continue to impact positively on the students. At the end of each semester, students are made to assess the lecturers, and the Quality Assurance. unit would analyze the previous and current students' assessments to determine whether there has been an improvement in the lecturer's performance. (PD 5, 2021).

On the same issue, a dean also remarked that:

Those who pursue Ph.D. programs are made to organize a seminar at the departmental or faculty level and present their final thesis to their colleagues. Moreover, a copy of the thesis is sent to the university library for keeping. (PD 3, 2021).

Caena [13] asserts that CPD should have positive effects, which should be felt at four levels. At the first level, it should affect the teacher's effectiveness. This is made evident in his teaching and what is regarded as his teaching effectiveness. The students and colleagues should experience the efficacy of a lecturer's teaching. Caena also asserts that CPD effectiveness should be affected at the school level.

Caena [13] believes CPD should also touch on the broader social community. According to him, when lecturers undertake CPD programs, the impact has ripple effects on the society in which the institute is cited. On his side, ATL [14] opines that CPD should lead to professionalism and build and develop the teacher's confidence and motivation. In a way, all institutions expect lecturers who embark on CPD programs to find their roles easier as it makes them well-versed in changing contexts and helps them absorb information throughout the school year.

Has there being any Change in the Field of CPD since you were Employed in this Institution?

When were the lecturers asked whether there have been changes in how CPD is organized in the University? Almost all the respondents (96%) affirmed the fact that a lot of changes have taken place is terms of CPD. A lot of emphasis is now placed on CPD in the University since the change. Unlike the Polytechnic era, a lot of emphasis is placed on CPD by the University. The papers demanded for promotion and the number of years one must teach to qualify to present papers for assessment for promotion have all changed. Before the polytechnic was upgraded to university, all the lecturers assessed. The assessment led to downgraded some of the lecturers from lecturers to assistant lecturers. The University demands a higher result from lecturers than when it was a Polytechnic. Sample responses from the three categories of respondents are given below for perusal. A lecturer responded that:

Many changes have taken place in the ways CPD is organized, and the scope has widened. At first, a lecturer who has taught for four or five years can submit four published papers to be promoted to the next grade, but it has changed to six papers after teaching for five to six years after the last promotion. Moreover, at first, a lecturer with a master's in philosophy could be

promoted to a senior lecturer when the person satisfies the criteria for the promotion. But as of now, you can satisfy the criteria for promotion, but if you do not hold a Ph.D., you can't be promoted. The most worrying aspect is that you do not qualify for study leave with pay if you are above the age of fifty. (PL 13, 2021).

A dean of faculty responded that:

A lot of changes have been made in terms of CPD programs at the University. At first, when it was a polytechnic and since it was upgraded to university status, the criteria demanded in terms of CPD have been raised to meet the standards of the traditional universities. The basic certificate a person needs to be employed in the University is a Ph.D. Those who were engaged with Master of Science or Master of Arts or Master of Philosophy degrees were not dismissed; they were given some years to upgrade themselves. The other change is that those young lecturers are given study leave with pay to pursue their terminal degrees. Those above fifty years do not qualify for study leave with pay, but those who can sponsor themselves for Ph.D. studies can write for permission. Heads of departments can make special arrangements with such people to pursue their terminal degrees in local universities while still lecturing. Those who do not take advantage of this opportunity would not be dismissed but cannot earn a promotion to the next grade. (PD 4, 2021)

From the responses above, it can be concluded that CPD in Technical universities has gone through a lot of changes since the Polytechnics were upgraded to university status. The requirements for promotions have been raised as the situation has changed. This demands that the lecturers boost themselves up to meet the criteria for promotion. The universities have provisions to help the lecturers to upgrade themselves. The University gives study leave with pay and without pay to lecturers to upgrade themselves. It also sponsors lecturers to attend conferences and other programs. The government also provides research and book allowance to lecturers to conduct research, subscribe to professional journals, and buy books. When a lecturer lectures for continuous six years, he/she can apply for sabbatical leave with pay to go to other institutions for one year to enrich his knowledge and competencies. The service condition for the University provides CPD in areas such as study leave with/without pay, sabbatical leave, industrial attachment, presentations at local and international conferences, and payment for publications in world acclaimed journals. Collaborative research with academic or industrial colleagues is also encouraged [15].

Which CPD Programs does the University put Premium on?

This section discusses the CPD programs the technical University puts a premium on. All the respondents (100 %) agreed that all types of CPD programs are encouraged, but the University puts premium on terminal degrees (Ph.D.). That aside, the respondents were of the view that any CPD program that can help the lecturer to be efficient and effective and thereby improve his/her professional competencies and delivery is the University's priority. The ultimate concern is that any CPD embark on by lecturers can impact positively on the students for them to fit perfectly in the industrial or real world of work. The University aims to turn out innovative and versatile students who can increase productivity as they get employed after graduation. Better still, the University expects lecturers to acquire skills and competencies that would enable them to turn out graduates who can set up their own businesses and would not become a burden on the nation. The sample views of the three categories of respondents involved in the research are provided below for us to know how they responded to the question.

A lecturer expressed the view that:

The University puts a premium on CPD, which enhances lecturers' skills, competencies and knowledge and enables them to impact positively on students learning. However, the

University places a premium on acquiring terminal degrees (Ph.D.). It is in the status of the University that the minimum qualification for teaching appointment is a Ph.D. As the University was upgraded from polytechnic, many people do not have terminal degrees. The University is determined to help all lecturers without terminal degrees to acquire one within the next ten years. For this reason, people who seek to earn a Ph.D. are given priority in the scholarship award, but such people should not be more than fifty years old. Those who are more than fifty years and would like to pursue terminal degrees have to sponsor their programs but should seek the permission of the head and the dean (PL 23, 2021).

A head of the department expressed a similar view as that of the lecturer above. He responded that:

The University puts a premium on all CPD programs, especially those that will enhance the lecturer's skills, competencies, and knowledge to improve his teaching skills. However, more scholarships are allocated to those seeking terminal degrees. In the next few years, that emphasis would be placed on those seeking practical competencies that would impact students' practical skills. The focus would be shifted to those seeking industrial experience or collaboration with industries. In a technical university, the students must be trained to perform in the industrial sector (PH 5, 2021).

A dean collaborated with the views expressed above. He said that:

As much as the University has to help those without terminal degrees to acquire them, it operates in a competitive global world. The University puts a premium on the skills that can improve the research skills of lecturers to do quality publications and come out with innovations and new products. The University is shifting its attention to the skills, knowledge, and competencies that could give them a comparative advantage in this competitive world (PD 3, 2021).

The discussions above make it clear that the University puts a premium on any CPD that gives lecturers knowledge, competencies, and skills. The University encourages any program that helps lecturers to improve their teaching and delivery skills. However, the University puts a high premium on terminal degrees. As most lecturers had master's degrees when the polytechnic was upgraded to technical universities and the minimum qualification for the lecturer is Ph.D., the University is encouraging all lecturers without terminal degrees to acquire one.

Beyer [16] asserts that any type of learning institution evolves around the CPD model, creating a teaching system and teacher education that can generate and empirically validate connections between teacher effectiveness and student learning. According to Beyer, this type of CPD relies on a behaviorist perspective of learning which focuses on the competence of individual teachers and resultant rewards at the expense of collaborative and collegiate learning. According to Beyer [16], the standard-based CPD model encourages teachers to rely on the central direction in assessing their teaching capacity. Smyth [17] believes that the Standard-based CPD model sets a clear expectation regarding the extent to which teachers should take responsibility for their professional learning.

Does the University Organize in-house CPD for Lecturers?

The researcher sought to find out from participants whether the University organizes in-house CPD for lecturers. All the respondents (100 %) responded that it is the university policy to organize at least one CPD program in the University every year. The quality assurance unit assesses the overall CPD needs of lecturers at the end of each year through the analysis of the students' assessment of lecturers. The unit can determine the CPD needs of lecturers through this process. The analyzes of student assessment of lecturers is done at the end of each

semester. After the analysis, the unit discusses the report with the university authorities, and a topic and resource persons are identified for the in-house CPD program. The responses of the three categories of respondents are given below for us the peruse their responses. One of the lecturers responded that:

The University has the policy to organize at least one in-house training for academic staff annually. In 2020, no seminar was organized due to the COVID-19 pandemic. However, the previous year two workshops were organized. The University assesses the University's needs and the direction the University should go. The University organizes a four or five-day seminar or workshop for all academic staff. The University invites experts from within or outside the country as conference facilitators or speakers. Sometimes workshops are organized for non-academic staff as well. This aside, a department or faculty can choose to organize a workshop or seminar for her academic staff (PL 17,2021).

On the same issue, a head of the department collaborated with the assertion of the lecturer. He said:

The University is concerned about standards, and the Quality Assurance (QA) section always seeks to raise lecturers' knowledge, skills, and competencies to meet international standards. Each year the QA section identifies an area that lecturers should be trained in and makes recommendations to the university leadership to organize CPD programs. They also recommend the type of resource people to invite. Such experts can be from the University or another university/ institution home or abroad.

The discussion above clarifies that the University organizes CPD for its lecturers. The Quality Assurance department section of the University, at the end of each semester, analysis the assessment of lecturers by the students. After the study, the QA section identifies the lecturers' CPD needs and organizes CPD to resolve them. The University has the policy to organize at least one CPD annually. The resource persons for the University's organized CPD could come from the nation or other nations.

The transformative model of CPD recommends that a combination of several processes and conditions be considered when designing a CPD for the institution's staff. Hoban [18] says that the team should have ongoing innovative CPD programs for any institution to support educational change. He further suggested that any model chosen should be a collaboration between teachers, academics, and the University. Any CPD program organized for lecturers should aim at helping them apply their knowledge in practice to support student learning [18].

Is there a Budgetary Provision for CPD?

The issue of whether a budgetary provision is made to enable lecturers to attend CPD programs was discussed. All the participants (100 %) agreed that although such provision is made, it is not adequate. The respondents asserted that although the university budgets for the CPD for lecturers, the budget is not adequate. The number of applicants who apply to undertake CPD each year far outnumber the resources available. However, the committee responsible for scholarships and conferences seeks to satisfy all the faculties in the University in terms of scholarships and conference sponsorship. The committee can approve some of the applications, provided the applicants can find money to sponsor themselves. Samples of the responses given by all the categories are provided below for our perusal.

One lecturer responded that:

The University is concerned about the career development of its staff and insists that all lecturers should attain terminal degrees. Still, due to budgetary constraints, only a few people are given study leave with pay to do so. As the University came out from an existing Polytechnic and the minimum qualification was a master's degree, many lecturers would have to upgrade to have their Ph.D. Moreover, the process is very competitive. The budgetary

allocation is inadequate for other CPD programs (PL 16, 2021).

On his part, a department head collaborated with the views expressed by the lecturer above. He said that:

My worry is that allocations for CPD programs are not decentralized, and one has to route their application from the head of the department to the dean of faculty before it goes to the scholarship and conferences committee to be considered. Due to the number of applications, some departments may not get any of their applicants considered for a particular year. For a fair distribution, it would be helpful for each department or faculty to be given a quota each year (PH, 5,2021).

A dean of faculty also expressed a similar sentiment as those above. He responded that:

The faculty and departments may have a particular need, but as allocations for scholarships and conferences are centralized, some faculties and departments are overlooked in specific years. I advocate that the financial grants for scholarships should be decentralized in the faculties or departments (PD 4, 2021).

The university budgets for CPD programs each year. The analysis and discussions above made it clear that the department does not provide funding for CPD. However, each department at the beginning of each year sends her CPD budget to the University for it to be included in the composite budget. Although the university budget for CPD needs lecturers, it is not sufficient. Due to insufficient resources, not all applications for sponsorship for CPD are met. The University is supposed to organize two CPD programs each year but cannot do so because of the scarcity of resources.

King [3] asserts that professional development for teaching and research should be considered a normal part of professional life for all academic staff. According to King [3], professional development for teaching staff should be part of institutional structures and reward policies of all institutions of higher learning. He advocated for support for the team who seek to enhance their understanding of their preferred learning styles and needs.

The unified condition of service for the staff of the public University of Ghana [15] provides avenues for career prospects for lecturers and support for those who seek to embark on continuing professional development. In universities, professional development is tied to promotions and administrative positions. At the public universities in Ghana, one should be at least a senior lecturer before one can hold a managerial role. The University makes provision for sponsoring deserving employees who have served for a minimum of three years' continuous service for external/internal training schemes in recognized institutions to acquire qualifications or experience relevant to their work.

Conclusion

The study explored lecturers' understanding of Continuous Professional Development (CPD) and how CPD contributes to the career prospects of Technical University lecturers in Ghana. The study established the link between CPD and the promotional reward among the academics in technical universities in Ghana. Lecturers who embark on continuous professional development are likely to earn promotions and be appointed to administration positions. There is a need for comparative studies on developing and developed regions on continuing professional development among academics to be carried out in the future.

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Conflict of Interest

In the conduct of this research, there was no conflict of interest on the part of the researcher.

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Supervisor-Supervisee Relations and Job Performance: Study of Healthcare Field Officers in Chongwe, Zambia

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Abstract

The power of praise in the workplace can move employees from apathy or resentment to happiness and productivity. Reinforcement such as positive reinforcement makes people feel appreciated and encouraged, which can be motivating and rewarding. An observational study aimed at examining the relationship between motivation and employee performance using through the lens of the Reinforcement Theory of Motivation and The Law of Effect was conducted on a Team of Healthcare Field Workers. Purposive sampling of twenty (20) Healthcare Field Workers from Chongwe Rural District of Zambia was done with whom a series of both negative and positive reinforcement strategies were applied. The final outcome of the study revealed a significant positive change from 5% to 30% of the overall staff performance on the targets in just four (4) weeks. Such an outcome definitely demonstrated that by carefully and genuinely using a system of positive or negative reinforcements, individuals can learn the correct set of responses for any given stimulus especially in relation to their job performance. Research reveals that when managers are more supportive of autonomy, employees perceive the value of their work efforts and are able to perfom as expected.

Keywords*: Behavior, Modification, Reinforcement.*

Introduction

Strategic management is the most effective means of organizational growth and productivity. The most daunting task of a manager of any organization is how best to put together human and material resources to achieve the mission, vision, and objectives of the organization. Human nature has a lot of roles to play in terms of how committed he will be in the organization he is part of the workforce. Furthermore, the human being is a conscious ‘‘homo-economicus’’ whose actions and inactions, more often, are driven by circumstances that benefit him. These benefits might be extrinsic or intrinsic in nature. The individual yields his energy to the organization because of certain incentives that must not be compromised by management [1].

It is important to note that it is also a working strategy for the organization to see the problems of the employee as that of the organization as this will in turn encourage the employee to commit to the organization [2]. The study is therefore bent on investigating the relationship between motivation and employee performance among healthcare field workers in a rural District of Chongwe, Zambia.

Operant conditioning, also called instrumental conditioning by B.F Skinner, refers to where the outcome of a reaction determines the likelihood of a relapse [3]. Because of this operant conditioning; reinforced (rewarded) behaviors are more likely to be

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repeated, while punished behaviors are less likely to be repeated. As humans, we are always determined to seek pleasure and always try to avoid uncomfortable situations. So you can use the conditional action to achieve the desired the action.

According to the Law of Effect Principle argues that behavior that is followed by pleasant consequences is likely to be repeated, and behavior followed by unpleasant consequences is less likely to be repeated [4]. This basically in-tells that certain actions in a situation are as a result of the available consequences; this is to say that all behavioral response is due to a particular stimulation and consequence.

Reinforcement motivation theory focuses on achieving the desired level of motivation in employees through reinforcement, punishment, and elimination. It is generally accepted that as a leader you receive rewards for encouraging desired behavior in the organization and penalties for discouraging undesirable behavior. It is also expected that erasure is done to avoid perpetuating behaviors learned on the job. This then implies that a manager can achieve the desired performance through reinforcement, punishment, or extinction, and the process is called the operant state. Reinforcement, which can be positive or negative, is used to reinforce a desired behavior. Punishment serves to discourage employee misconduct [5]. Eliminating of a specific behavior refers to reducing the possibility of unwanted behavior. The theory therefore revolves around the basic idea that consequences influence behavior and that rewarding consequences lead to punitive consequences that cause certain behaviors and reduce the occurrence of behaviors. Consequences that don't lead to reward or punishment also stop the behavior. It should be noted that this theory helps managers choose the right motivational methods to motivate employees depending on the situation.

In investigating the relationship between motivation and employee performance among healthcare field workers in a rural District of Chongwe, the researcher observed the impact of motivation and employee performance using the theoretical principles of Reinforcement Theory of Motivation and The Law of Effect applied on employees for a period on six (6) consecutive weeks.

The objective of the study is to examine the relationship between motivation and employee performance among Healthcare Field Officers in Chongwe, Zambia.

Theoretical Framework

The study adopts reinforcement theory and the law of action as a framework for analysis. Reinforcement theory is widely associated with B.F. Skinner, who proposed that all behavior is a function of its consequences. The theory is one of the process theories that explain how people are motivated and what they are motivated to do. There are basically three components (stimuli, response and resultant behavior) to reinforcement theory, and understanding these components would guide the manager in the most effective and strategic application of theory for the desired organizational outcome.

The principle of the law of effect, developed by Edward Thorndike (1898), suggests that responses followed by satisfaction become firmly attached to the situation and are therefore more likely to recur if the situation repeats itself. On the contrary, when the situation is associated with discomfort, the association with the situation is weakened, and if the situation is repeated, the reactive behavior is less likely. As a result, behaviors with adverse consequences are less likely to be repeated.

Significance of the Study

The Team of Healthcare Field Workers in Chongwe, Zambia had significantly reduced work productivity, at 5% from the overall set targets, lack of collaboration among its team members, and occasions of physical and verbal confrontations among themselves.

Implementing a behavior modification program on such a team would enhance work productivity and collaboration among them. The study emphasized the significance of teamwork and its effects on employees' performance in the workplace.

This study borders on the principle that operant conditioning can be used to produce extremely complex behavior if rewards and punishments are delivered in such a way as to encourage move an organism closer and closer to the desired behavior each time. In this case, it was believed that through behavior modification, the Healthcare Field Workers in Chongwe, would improve their work performance through the application of the Reinforcement Theory of Motivation as a Behavior Modification approach.

Scope of the Study

This study was conducted on a Team of Field Workers working for the Centre for Infectious Disease Research in Zambia (CIDRZ), an independent, local, non-governmental health Organization that has been an active partner of the Government of the Republic of Zambia through the Ministry of Health, and other Ministries since 2001, whose main focus area is taking care of People Living with HIV/AIDS, among the many other tasks the Organization does. The sample size of the participants was 20 team members, comprising of field workers of both gender-based in Chongwe District of Zambia, a remote District of Lusaka Province.

Methodology

A purposive sampling method of 20 participants among Healthcare Field Workers that work with people living with HIV/AIDS was made. The demographics of the population was very similar, and this was to reduce on the rate of study bias. A series of both positive and negative reinforcement strategies were used on the team that comprised of Peer workplace constructive feedback mechanism, interactive group sessions on team building, and threats of losing employment if performance was not improved. A structured questionnaire was administered to the Healthcare Field Workers to describe the characteristics of their team before and after the intervention to collect both qualitative and quantitative data. The exercise was conducted for a period of six (6) weeks, after which data analysis with Statistical Package for the Social Sciences (SPSS) was summarized.

Specific Intervention Strategies Applied

Positive reinforcement through:

1. Mentorship to the group and individuals on teamwork (what it means, importance, and qualities of an effective team). Demonstration through Video Clips on the importance of teamwork.
2. Mentorship by the Organisation Management Team on the importance of setting work targets and working towards achieving them, the importance of teamwork, and skills' transfer among members.

Negative reinforcement through:

1. Threats by the Management Team on the possible termination of employment if targets are not met.

Presentation of Study Results

The table below displays the tasks and findings targeted on modifying the behaviour of a team of twenty (20) healthcare field workers working with People Living with HIV/AIDS in Chongwe District of Zambia that were observed in the exercise after a period of six (6) weeks.

Table 1. Characteristics of the Team before & after the Intervention & Specific Interventions

Variable	Before the Intervention	After the Intervention
Idea of Purpose and Vision of tasks	50% somewhat agreed that the team had clear goals (purpose and vision).	80% somewhat agreed that the team had clear goals (purpose and vision).
Defined job descriptions	64% agreed that the Team had defined job descriptions	80% agreed that the Team had defined job descriptions
Communication of tasks and updates	100% disagreed that the Team promoted open and clear communication of tasks and updates.	30% disagreed that the Team promoted open and clear communication of tasks and updates
Decision making	83% disagreed that there was an effective decision-making process	20% disagreed that there was an effective decision-making process.
Team Participation	67% somewhat agreed that the Team had balanced participation.	70% agreed that the Team had balanced participation.
Valuing of Team diversity	100% disagreed that the Team had value diversity (thinking, idea generation, problem-solving, and experience).	60% agreed that the Team had value diversity (thinking, idea generation, problem-solving, and experience).
Conflict Management	100% disagreed that the Team manages conflicts effectively (seeking common ground; incidences of Team members almost physically fighting during board meetings).	60% somewhat agreed that the Team manages conflicts effectively (seeking common ground).
Acceptance and Dependability	83% disagreed that the Team promote a positive atmosphere (acceptance, dependability).	75% agreed that the Team promote a positive atmosphere (acceptance, dependability).
Collaborative relationships	100% disagreed that the Team promote collaborative relationships.	20% disagreed that the Team promote collaborative relationships.
Participative leadership	83% disagreed that the Team had participative leadership.	35% disagreed that the Team had participative leadership.
Overall performance	Overall performance towards targets by the Team was 5%.	Overall performance towards targets by the Team increased to 30%.

Discussion of Study Results

After the implementation of a series of both negative and positive reinforcement strategies, there was a significant observable change in the characteristics of the Team. In the exercise to observe what happens to a Team when different Behavioural Modification Strategies were implemented, the following approaches where used:

Impact of Behaviour Modification on Work Performance and Productivity

Characteristics before the Interventions

Behaviour was measured before the intervention and after. Before the interventions (reinforcements) were implemented, the Team

was characterised by overall performance of the Team at 5% in most of the targets, despite 50% of the respondents somewhat agreeing that the team had clear goals (purpose and vision), and 64% agreeing that the Team had defined job descriptions. 100% of the respondents disagreed that the Team promoted an open and clear communication of tasks and updates, 83% disagreed that there was an effective decision-making process, and 100% disagreed that the Team had value diversity (thinking, idea generation, problem-solving, and experience), 100% disagreed that the Team manages conflicts effectively (seeking common ground; incidences of Team members almost physically fighting during board meetings), 100% disagreed that the Team promotes collaborative relationships, and 85% disagreed that the Team had participative leadership.

Characteristics after the Interventions

After the interventions were made for a period of 4 weeks, it was noted that there was a significant positive change among the Team members and job performance. The following were the observed behaviours among the Team members after the interventions: the overall performance towards the given targets had increased from 5% to 30%, 80% from 50% somewhat agreeing that the team had clear goals (purpose and vision), and 80% from 64% agreeing that the Team had defined job descriptions. Only 30% from 100% disagreed that the Team promoted open and clear communication of tasks and updates, 20% from 83% disagreed that there was an effective decision-making process, and 60% from 100% agreed that the Team had value diversity (thinking, idea generation, problem-solving, and experience), 60% from 100% somewhat agreed that the Team manages conflicts effectively (seeking common ground), 20% from 100% disagreed that the Team promotes collaborative relationships, and 35% from 85% disagreed that the Team had participative leadership.

Traditional theories of behavior change rely mostly on influencing higher-order mental processes as a route to altering deliberate responses. [(5)] Reinforcement theory has inspired many types of human resource development (HRD) initiatives. Despite their widespread use, reinforcement-focused programs designed to control the outcome of behavior through external rewards have their own limitations and organizational costs [6]. It is very critical to understand motivation in work environments as well as to explore more efficacious forms of motivation, both intrinsic and extrinsic, simultaneously. The study findings demonstrated that through the Principle of Self-determination theory (SDT) and Capacity building, healthcare workers were concerned with forwarding influence, independent choice, and the degree to which behavior was internalized as self-determined [7]. This is to say that their source of motivation was influenced by their perceptions of the work environment as well as their behavioral outcomes.

It is argued that the most optimal forms of motivation are believed to originate from internal regulation of basic psychological needs rather than external forms of motivation such as those central to reinforcement-focused theory and practice [8]. In this regard, the healthcare field workers were more concerned with job losses if their job performance did not improve. Work is perhaps the most dominant domain in most adults' lives, yet employees have highly varied experiences. Some find work engaging and fulfilling. Others see it as a time to be endured. In the study, it was observed that before the intervention, 100% disagreed that the work environment promoted open and clear communication of tasks and updates within the Team, with 67% somewhat agreeing that the Team had balanced participation. After the invention it was observed that there was a shift on mindset among the team in that 30% disagreed that the Team promoted open and clear communication of tasks and updates, and

70% agreed that the Team had balanced participation, respectively. This demonstrated that after the intervention, the healthcare field workers internalized the value of their work efforts, became more autonomously motivated, and thus performed better and displayed higher job satisfaction and well-being. As is argued that having workers be more self-motivated turns out to be better not just for employees but for organizational profitability and effectiveness as well [9].

It was also proven that by empowering workers rather than overpowering the healthcare field workers through mentorship on teamwork (what it means, importance, qualities of an effective team), demonstration through Video the importance of teamwork, and mentorship by the Organization Management Team on importance of setting work targets and working towards achieving them, the importance of teamwork and skills' transfer among members, the best motivational outcomes were achieved. The majority demonstrated this, 75% agreeing that the Team promoted a positive atmosphere (acceptance, dependability), and a drastic reduction of those disagreeing disagreed that the Team promoted collaborative relationships, and disagreed that the Team had participative leadership, at 20% and 35% respectively.

This supported the notion that Management approaches in organizations, both large and small, were thus being transformed from trying to control people from the outside with carrots and sticks to actively cultivating the work conditions and supervision styles that lead to motivation from within, that is to more autonomous work motivation and job commitment [10-12] Around the world, organizations are finding that, by supporting autonomy rather than applying controls, they not only help employees flourish, they also benefit their own bottom line.

These findings were in line with the study findings focused on the effect of motivation on employees‟ performance using Alvan Ikoku Federal College of Education (AIFCE) as a study area in Nigeria, where it was found that there was a significant relationship between staff motivation and staff performance. The study further recommended that organizations should consider staff motivation as a cardinal responsibility and that unless staff motivation is properly executed, organizations and their managers would always suffer from employees‟ negative attitudes to work [13].

Limitations of the Study

The sample size for the exercise was too small (20) and limited to employees engaged in fieldwork in the health care industry. It is possible that the approaches to be used would be different if the exercise was to be implemented among other Teams of different industries. The sample size could not conclusively depict the desired outcome when it came to approaches of behavioural change with respect to the use of threats (negative reinforcement) as a motivator. The study also failed to take into account the role of inherited and cognitive factors in learning and thus is an incomplete explanation of the behavioral changes that occurred that eventually influenced job performance in the study.

Summary and Implication of the Study

The study aimed to investigate the impact of the supervisor-supervisee relationship on job performance, and the findings demonstrated that there is a great impact that this dynamic relationship has on job performance and behavior modification. The study demonstrated that the adopted theoretical framework of the reinforcement theory and the law of action as a framework for analysis showed how behavior was a function of its consequences among the healthcare field workers, and how they were motivated, on what they are motivated to do, and by whom (supervisor). Basically the three components (stimuli-positive or negative, response-commitment to duty and resultant behavior-performance outcome) of the

reinforcement theory helped the supervisor (Mr. Chalachew Alemu Tiruneh) in effectively understanding and correctly guiding his team of healthcare field workers through strategic application of theory for the desired organizational outcome.

The strategic approach applied created certain awareness in the workplace for the team members that ensured certain behavioral responses exhibited after interfacing with the stimuli in the environment, and the outcome component was that of improved general performance towards set objectives and targets. This showed that the teams' response to the stimuli used was a function of what was expected, that is to say that if a supervisor can have a good management-strategy, they would retain their workforce; employees would certainly see themselves as stakeholder in the organization and most likely protect their interests by improving performance. The principle of the law of effect was demonstrated by the team's continued determination to achieve set objectives as good performance was often followed by satisfaction, while poor performance was associated with discomfort and disapproval.

In application of the two theories, a supervisor must identify elements that are incompatible with positive stimuli and eliminate them so that they do not evoke negative responses that ultimately lead to negative outcomes. If the supervisor is accurate (positive) on choosing the "stimulus" component of the theory, the response and outcome components would at least be fairly consistent. This means that employees will be fair enough to respond accordingly to positive impulses from the work environment. It is probably more likely that the supervisor would succeed in influencing positively the employee performance if the "stimulus" component of the theory and the parts of the theory relating to the "response" and influence are handled cautiously and correctly. This is so because getting the stimulus component right (positively) would ensure the desired response and influence components will take place sequentially.

The two theoretical applications are consistent with Agris (1964) who states that "discontinuance, turnover, slowness, alienation and bad behavior occur where the organization is managed in such a way that the needs and goals of the individuals do not match their organizational needs. In extreme cases, non-commitment and malpractice/falsification of performance is most likely to occur.

Conflict of Interest

The study was an individual observation of the performance of the local Healthcare Field workers in Chongwe District, Zambia. The study was not funded by any Organizations or Individuals.

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Conclusion

Behavior modification techniques work in many situations, it is an approach that yields positive and almost the desired results, especially when the objectives are set before-hand so as to know what is expected after the intervention. In the exercise conducted it was observed that there was tremendous positive behavioural change among the team which led to the improved overall job performance. The change was also characterised by a more unified and goal-determined group that promoted an open and clear communication of tasks and updates. Before the implementation of the strategies the Team could not even be described as a Team due to its lack of collaboration. Supervisors attempting to motivate their team members must ensure that they do not reward all team members

simultaneously. They must tell them what they are not doing correct and how they can achieve positive reinforcement.

Research reveals that when managers are more supportive of autonomy, employees perceive the value of their work efforts, become more autonomously motivated, perform better, and show greater job satisfaction and well-being. There is a direct relationship between the employee and the company. Employee behavior is very important for any organization, and its culture strongly influences the behavior of the former. Behavioral change strategies should be used to improve productivity and efficiency in organizations.

Finally, because knowledge alone does not equal behavior change, understanding how to improve behavior is essential for successful therapy and other behavioral interventions. That is what every behavioral therapist must always remember at all times.

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Collection Development Variables and Use of Library Materials in Academic Libraries in South-South Geo-political Zone of Nigeria

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Abstract

This study investigated the "relationship between collection development variables and use of library materials in academic libraries, in South-South, Nigeria. To achieve the purpose of this study, three research questions were raised, and three hypotheses were formulated to guide the study". Literatures related to the variables under study were reviewed; accordingly, the design for this study was ex-post facto design with a total population of 16620 students with a total of 800 as the sample for the study. This was done with the help of stratified and purposive random sampling techniques. The questionnaire titled: Collection Development Variables and Use of Library Materials in Academic Libraries Questionnaire (CDVULMALQ) was the instrument used for data collection. The instrument was validated by two experts in measurement and evaluation. The reliability of the instrument was established through the spilt-half method. A trial test gave reliability estimates of 069 to 086, and the hypotheses were tested at a .05 level of significance using Pearson's Product Moment Correlation Analysis. The results of the analysis revealed a significant relationship between acquisition, weeding, and preservation of library collection and the use of library materials. Based on the findings, it was recommended, among others, that: Government should pay more attention to funding and acquisition of library materials for academic libraries.

Keywords: *Academic Library, Collection development, Information resources, Library materials, Library resources, Use of the library, Utilization.*

Introduction

Collection development is a process that involves carefully choosing relevant information resources covering different areas in each educational curriculum from a list of publications for the university libraries to cater to the needs of users. This helps the librarians to acquire only those information resources that are demanded and useful to both students and lecturers in print and non-print formats. For information resources to be effectively utilized, the library holdings must be such that they will satisfy the students' information needs and academic aspirations, this can only be achieved if the right titles are acquired. This will encourage the use of the library and its resources, thus, preventing discouragement and lack of interest in the use of library resources. However, students could show a lack of interest in utilizing library resources if the materials selected and acquired are of no relevance to the students' information needs or that the materials are obsolete.

Consequently, acquiring library materials is not a child's play, it takes a process of ordering such information resources in both print and non-prints for the library. This is usually done through designated librarians known as

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acquisition librarians. It is also a process of acquiring qualitative and relevant materials to meet the needs of the students and build up a balanced collection to meet the objectives of the library. [1] and [2] maintained that collection development is a planned systematic building up of a collection based on the objectives of the library. [3] defined collection development as a planned continuous, cost-effective, and preferential acquisition of qualitative, relevant materials to meet the needs of users and the objectives of the library. It can be deduced from these definitions that collection development can not only be viewed from the angle of growth in volumes and titles but also in the quality of materials acquired that will enhance effective information delivery and the usage of such materials to reduce user frustration. Where the acquired materials fail to meet users' expectations, then there is the tendency that such materials will not be utilized. However, if the library acquires current, accurate, and relevant information sources that readily meet the students' information needs, then it will increase utilization. [4] observed that collection development is considered a critical factor in the provision of adequate and relevant information resources in the library. For libraries to be able to build up a balanced and unbiased collection, they must formulate policies that will serve the interest of users. He noted that acquisition librarians encounter challenges (both internal and external) in the process of formulating collection development policy.

Consequently, [5] observed that the major task of any library is to provide those materials which the individual user will find reliable and useful. Thus, the amount of satisfaction a reader finds in a library depends directly upon the library materials available for use in the library. They maintained that collection development is viewed as the process of building up and improving upon a library's information resources both qualitatively and quantitatively. Also, [6] highlighted the importance of collection development in libraries. They pointed out that certain variables must be taken into consideration while developing a qualitative collection for the benefit of the users. According to them, the variables include policies, principles, techniques and procedures, problems associated with collection/development, and weeding. They further explained that it is equally important to evaluate the collections to know their usefulness to its users.

Generally, in every library, be it simple, complex, modern, or local, an operational guideline and policy must serve as a guide to the acquisition and collection of information materials. [7] opined that policies are guidelines that ensure that all the information materials acquired are current and relevant to the users for effective utilization. However, he acknowledged the fact that the process of policy development is a complex one as such, must involve everyone, stakeholders, library users, etc must all get involved in building a world-class collection that will meet the needs of its users. It is important to note that it is not only librarians and information specialists that formulate policies for library collection; faculties and other interested individuals or users are also involved. The policy should reflect the goals and objectives of the parent institution". "For effective collection development policy'', there must be a "document that clearly highlights the mission and vision statement of the library. A policy development process requires proper planning to enhance a standard policy document.

To keep the collections in good condition and up-to-date, libraries must at some point remove older, irrelevant, or those materials that are not frequently used to make space for new acquisitions. This process is referred to as weeding, which is the removal of obsolete, shabby, and non-usable materials (books, periodicals, encyclopedias, videos, etc.) from a library collection in a planned and systematic way. It is essential that the library information

resources always be in good shape to encourage students to effectively utilize the information resources. A good number of materials on the shelves of the library are in low demand and are hardly used by students, which renders them ‘‘unusable”. Meanwhile, every day the acquisition unit acquires new editions and titles of books and journals which are currently being kept in the Cataloguing unit because of lack of space. The library, therefore, has a lot of information resources that are not in use and need to be removed completely to make room for newer materials. A well-weeded library shelves are neat, attractive, and easily accessible to students making information resources search less stressful and a more satisfying task. Inversely, library shelves with irrelevant and obsolete information resources repulse the students, thereby leading to students’ lack of interest in the use of library resources’’. Therefore, this study was conducted to examine collection development variables and use of library materials in academic libraries in South-South Geo-political zone of Nigeria.

Purpose of the Study

The purpose of this study was to investigate how collection development variables can relate to use of library materials in academic libraries in South-south, Nigeria. Specifically, the study seeks to:

1. Find out the relationship between acquisition of information resources and use of information resources.
2. Investigate the relationship between the preservation of information resources and use of library materials.
3. Examine the relationship between the weeding of information resources and use of library materials.

Research Question

The following research were formulated to guide the study:

1. To what extent does acquisition of information resources relate to the use of library materials?
2. How does the preservation of information resources relate to the use of library materials?
3. What is the relationship between the weeding of information resources and the use of library materials?

Statement of Hypotheses

The following hypotheses were formulated to give direction to this study:

1. There is no significant relationship between the acquisition of information of resources and use of library materials.
2. Preservation of information resources has no significant relationship with the use of library materials.
3. Weeding of information resources has no significant relationship with the use of library materials.

Literature Review

In libraries, acquisition can be seen as the act of procuring and obtaining relevant library materials that are used for the growth and development of library users. Therefore, acquisition can be seen as the process of acquiring of qualitative and relevant information resources to meet the needs of the users and the objectives of the library. Acquisition of information resources is vital in collection development. The acquisition is the gateway to building a strong and desirable collection that will adequately cater for the needs of the university. The acquisition provides the library with diverse and adequate information resources in print and non-print formats to suit the need of the students. Adewuyi cited in [8] sees the acquisition as the bedrock upon which stock development is based. According to him, the acquisition procedure usually begins with stock checking and ends when the materials ordered for are received and certified by the acquisition staff.

Acquiring irrelevant or obsolete or inaccurate, and inadequate information resources on the other hand, does not encourage utilization of such information resources as the students do not find them useful enough to meet their information needs and the university also cannot achieve their cardinal goals. [9] reported that the problem of underutilization of information resources was inadequate information resources in the libraries. So, where the information resources are inadequate and found wanting, underutilization is inevitable. The goal of acquisition programs in the institutions is for the building of a comprehensive collection in the various subject areas for teaching, learning, and research purposes. Where the acquisition of information resources is not optimum, the achievement of the educational goals of the university is a mirage. Stressing the importance of print materials in the library", [10] opined that acquiring information resources is a core activity of libraries. "University libraries the world over still engages in buying and maintaining massive print collections while also maintaining digital formats. Despite the prophesy of vanishing print collections and the emergence of the digital paradigm, book collections still have a central role in building library stock.

[8] X-rayed the performance and function of collection development in five academic libraries in Imo State, Nigeria. The objective of the study was to determine possible operational flaws and proffer solutions. The study employed the descriptive survey research design. The population comprised one hundred and nine (109) professional and para-professional staff of the five academic libraries under study. Data were collected from all the one hundred and nine professional and Para-professional staff of the libraries using a self-developed questionnaire. Data were analyzed using frequency distribution and percentages. The Findings of the study revealed, among others, that lack of a coordinating unit for collection development activities and inadequate book votes, and irregular weeding of stock. Based on the findings, it was Measures addressing the flaws were suggested as a way forward in the discharge of the important function of collection development in the studied libraries".

[11] disclosed that academic libraries are the "nerve centers of academic and research activities'' which help the parent institution achieve its academic goals by developing adequate library collections and providing continuous and wider access to relevant information resources in print and non-print formats. Libraries are appraised by the quality and quantity of their collections. It is important that the university libraries acquire current, accurate, and relevant information resources necessary for supporting the teaching, learning, and research activities of the universities. Consequently, [12] maintained that, if the information resources are inadequate for the needs of the students, the library will not be heavily used". He noted that the acquisition of information resources for the library is one of the major functions of a library which has to do with the selection and purchase of information resources to build the library's collection.

[13] carried out a study centered on "acquisition practices in state university libraries in North Central Zone of Nigeria''. The study specifically sought to find out the acquisition policies in state university libraries in the North Central Zone of Nigeria, ascertain the acquisition pattern, ascertain the sources of acquisition, identify current problems encountered in the acquisition practices and finally determine strategies to enhance the acquisition process. The study was guided by five research questions directly drawn from the purpose of the study". 196 respondents were used as the sample drawn from the population using the purposive sampling technique. The instrument used to collect data from librarians, library officers, and staff in the acquisition and serial sections of the libraries was ''Acquisition

Practice Questionnaire (APQ). Other instruments for data collection were interviews and observation''. The instruments developed were face validated by the researcher's Supervisor and two experts. ''The researcher, with the help of one trained research assistant from each university, distributed 196 questionnaires to respondents. Furthermore, data was analysed using simple percentages, frequencies, tables, and mean. The research findings revealed "that this important library activity is still stressed with problems which include: - Lack of adequate funds, non-existence of written acquisition policies, lack of skilled acquisition librarians, low level of publishing, lack of book trade, absence of staff motivation. The researcher recommends an increase in government allocation, proper formulation of written acquisition policies, training, and re-training of staff, and recruitment of skilled professional librarians to enable the state university libraries and similar libraries to overcome the problems associated with ''acquisition practices, among others".

[14] examined acquisition of library resources in Enugu State University of Science and Technology Library and Nnamdi Azikiwe Library, University of Nigeria, Nsukka. "The objective of the study was to determine the acquisition method and processes in the under-study university libraries". The qualitative research design was adopted for the study. Data was collected using interview and observation methods. The result from the findings showed that one of the libraries has no library acquisition policy. Furthermore, library materials are acquired through purchase, gifts, and exchange. The author recommended that: internet services should be connected to the libraries, to reduce the work stress of the acquisition librarians, more funds should be released to the acquisition department. Staff in the acquisition department should be adequately trained to provide effective and efficient services, and more selection tools should be made available, proper acquisition policy should be made for the library and strictly observed. This implies that those methods of acquisition are, however not the only way since donations constitute a major source of the collections. This is because donated materials may not tally with the needs of the accepting library.

[5] conducted a study to "examined the effect of collection development policy on library resources and users in university libraries in South-South Geo-Political Zone of Nigeria''. According to him, a collection development policy established ground rules for planning and budgeting, selecting, and acquiring library resources. These policies provide a framework for a well-organised collection development programmes for effective service delivery in academic libraries and the academic community at large. The study adopted a descriptive survey design, using a purposive sampling technique to draw a sample of one hundred and fifty (150) library users from the population under study. The instrument used for data collection was a questionnaire, and the collected data was analyzed using simple percentages. The findings revealed that problems such as funding pattern, information explosion and inflation were some of the variables affecting the smooth collection development policy in Nigerian university libraries. It was recommended, among others, that; the university libraries should train the librarians on business and negotiation skills that will enable them to understand the integrity of licensing and negotiation involved in the subscription of resources. However, [15] observed that material acquisition cuts across selecting and deselecting of current information resources and reviewing the resources, schemes for continuing acquisition, and evaluation of resources to ascertain how well they serve the users' needs. Therefore, a well-planned process of continuous and effective acquisition and preservation of current, accurate, and relevant

information resources to meet the requirement of the users is vital.

Information resources are preserved to ensure continuity of recorded knowledge and prevent loss of knowledge, especially in print format. Hence, [16] sees preservation as an activity that is concerned with maintaining a library's collections to be use either in their original physical form or in some other usable way. When information resources are well-looked-after and preserved, it makes the materials available for students to utilize them more in their learning and research activities. Also, the preservation of information resources allow information to be transferred from one generation to the other. Therefore, proper provision should be made available to preserve the information resources to ensure the availability and use of such information resources in the future. [17] carried out a study on preservation and conservation issues in selected universities in the south-west, Nigeria. It was recommended that, deteriorated materials be removed from the shelves and reading rooms as soon as they are noticed and taken to the bindery where they can be appropriately repaired and returned to the shelves to facilitate utilization.

[18] carried out a study to examine the various techniques used in preserving and conserving library materials in selected university libraries in Nigeria. The survey design was used. Fifteen (15) university libraries were purposively selected. A semi-structured questionnaire was used to collect data. Collected data were structured into grouped frequency distributions using the Statistical Package for the Social Sciences (SPSS) software. The findings revealed among others, that preservation and conservation techniques, though adopted in the university libraries, were not effective in use, although the libraries all had preservation policies. Based on the findings, recommendations were made toward improving preservation and conservation practices in the libraries.

[19] noted that dust and deterioration of books were the major problems in the preservation and conservation of information resources. The researcher, therefore, recommended that libraries adopt modem technology to preserve the information resources. [20] also reported that dust and particles serves as one of the greatest problem facing the management and preservation of non-print materials. [20] were of the view that library management should provide good working preservation policies, provision of functional air-conditioners to regulate the temperature and humidity of the storage area, provision of an alternative power supply to check the constant power failure in universities libraries, training and retraining of staff; and adequate funding should be provided for preservation programmes to increase the life span of the library materials. [21] carried out a study to "investigate the maintenance culture of information resources among libraries in two selected private higher institutions in the Anambra State of Nigeria''. The descriptive survey design was used for the study. A simple random sampling technique was also used. The population of the study was librarians working at the two university libraries. The universities under study were Paul University, Awka and Madonna University, and Okija libraries. The results of the study pointed out inadequate funding to carry out preservation activities in the library. Also, the study revealed that there was no preservation policy in the library. The findings of the study further showed that there was a lack of facilities for the preservation of resources in these libraries. If materials are not properly preserved, it will give room for deterioration and decay, as such, such materials should be weeded to create space for more current and up-to-date materials on the shelves.

Weeding of information resources is vital in collection development practice. It is obligatory if the library's vision and objective must be attained. Weeding often reveals the need for the acquisition of information resources and creates

space for the newly acquired information resources, reducing stress and time of the students in the search and retrieval of needed information resources in the library, it also leads to the easy discovery of lost or somewhat misplaced information resources. [22] opined that weeding is the removal of information resources (books, periodicals, encyclopedias, videos, etc.) from a library collection in a planned and systematic way. The deselecting process is an ongoing part of collection development, a deliberate and thoughtful activity that will keep the library current and vital. They maintained that the art of weeding library collection would bring the following benefits: create an up-to-date collection, ensure that all parts of the collection have been evaluated for equity issues and stereotyping, make gap analysis easier, direct further collection development, provide a cleaner and more attractive collection, make it easier to search and find relevant material, make it easier to maintain the library, highlight and makes accessible new and exciting resources.

[23] carried out a survey study on weeding strategy and effective management of library stock at the University of Ghana Medical School (UGMS) Korle-bu. The objective was to showcase the importance of weeding in maintaining an effective library collection. Using a survey research design for the study, and the instrument used for data collection was the interview method. The population of the study was made of twelve (12), which includes all professional and para-professional staff of the University of Ghana library. A sample of six (6) professionals and para-professionals were selected using the purposive sampling technique. Qualitative methods of description and thematic text analysis were used to analyze the data. The study revealed that there was no weeding policy in the UGMS library; there was also fear of creating space without replacements, lack of funds, and lack of time for weeding practice in the library. The study also revealed that the weeded items were kept in a special room and were donated to other libraries or sold at moderate prices to users. The researcher recommended that a collection development policy should be formulated by the UGMS library to include all aspects of the weeding process.

[24] carried out a survey on weeding practices in New Zealand academic libraries. The aim of the study was to discover if there is a gap between current weeding practices and best practices as identified in the literature. A qualitative research design was adopted in the study. The instruments used for data collection were structured questionnaires and semi-structured interviews. The population of the study consisted of (64) librarians chosen from the eight (8) universities in New Zealand, and sampling was done using the purposive sampling technique. The findings of the study revealed that lack of space, obsolete materials on the shelf, and irrelevant materials were the reasons for weeding. The researcher recommended that weeding and reselecting be treated as a more holistic process and that libraries should work for hand- in- hand in deselecting the books in their collection. [23] recommended that there is a need for collection development to formulate policy on the weeding process, to create space, and remove obsolete materials on the shelf. In the same vein, [24] was of the view that lack of space, obsolete materials on the shelf, and irrelevant materials were the reasons for weeding. The researcher recommended that weeding and deselecting be treated as a more holistic process and that libraries should work hand in hand in deselecting the books in their collection. Hence, [25] in agreement ascertained that weeding increases access to relevant materials as it frees shelving space from less used materials.

From the various literature consulted, authors have made it clear that collection development policies are in important in every library. They stressed the relevance of building a collection through the process of selecting, acquiring, preserving, and weeding library

materials for effective utilization. Hence, relevant and quality materials should be acquired in the library, as the right strategies should be put in place to keep the materials preserved while the obsolete decayed ones are weeded for a more user-friendly library that will catch the attention of user's academic libraries in South-South Nigeria.

Methodology

The research design adopted for this study was the ex-post facto design with a total population of 16620 sixteen thousand, six hundred and twenty students who registered in their libraries in five federal university libraries in South-South. The breakdown showed that the registered students in University of Calabar 3574 (21.25%), University of Uyo 3909 (23.24%), University of Port-Harcourt 3625 (21.55%), Federal University Otuoke 1501 (8.92%), and University of Benin 4011(23.85%). A stratified random sampling technique involving the purposive sampling technique was adopted for this study with a sample of 831 respondents. The researcher structured a questionnaire item titled: ''Collection Development Variables and Use of Library Materials in Academic Libraries Questionnaire (CDVULMALQ)'' for data collection. The instrument was designed by the researchers with the help of two experts in measurement and evaluation. The reliability of the instrument was established through the spilt-half method. A trial test gave reliability estimates of 069 to 086, the hypotheses were tested at a .05 level of significance Data collected was analyzed using Pearson's Product Moment Correlation Analysis. The instrument was divided into three main sections. Section A was designed to collect the respondents' Personal data (PD). Section B was made up of 18 items that were sub-divided to elicit responses on each sub-independent variable. Each component has six items. Section C had information on students' use of library materials with a total of six items. The respondents were required to indicate the extent to which the given statements applied to them on a ''4-point-Likert Scale of Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD)". 831 items were distributed, but only 800 items were returned and found usable.

Table 1. Universities and Population Distribution of Registered Students in Academic Libraries in South-South in 2017/2018 Session

State	University	No of faculties	Total
Akwa Ibom	University of Uyo	13	3909
Bayelsa	Federal University of Otuoke	8	1501
Cross River	University of Calabar	13	3574
Edo	University of Benin	-	4011
Rivers	University of Port Harcourt	12	3625
Total	**5**	-	**16620**

Sources: Library records, office of the university librarians of the various academic Libraries in 2017/2018

Results and Discussions

Hypothesis One

There is no significant relationship between the acquisition of information of resources and the utilization of information resources. "The independent variable in this hypothesis is the acquisition of information of resources while the dependent variable is the utilization of information resources''. To test this hypothesis, Person product-moment correlation analysis was employed. The result of the analysis is presented in Table 2. The result in Table 2 reveals that the calculated r-value of .321 is greater than the critical r-value of .088 at .05 level of significance with 798 degrees of

freedom. With this result, the null hypothesis was rejected. This result implies that there is a significant relationship between the acquisition of information of resources and the utilization of information resources. This means that the more information resources are acquired, the more they would be utilized of by students.

Table 2. Pearson Product Moment Correlation Analysis of the Relationship between Acquisition of Information Resources and Utilization of Information Resources (N=800)

Variable	X	SD	r-value	p-level
Acquisition of information resources	14.29	3.72	.321*	.000
Acquisition of information resources	15.04	3.36		

*Significant at p-value, df=798

Hypothesis Two

Preservation of information resources does not significantly relate to utilization of information resources. The independent variable in this hypothesis is the preservation of information resources, while the dependent variable is the utilization of information resources. To test this hypothesis, Pearson product-moment correlation analysis was employed. The result of the analysis is presented in Table 3. The result in Table 3 reveals that the calculated r-value of .176 is greater than the critical r-value of .088 at .05 level of significance with 798 degrees of freedom. With this result, the null hypothesis was rejected. This result means that selection of information resources does not significantly relate to the utilization of information resources.

Table 3. Pearson Product Moment Correlation of the Relationship between Preservation of Information Resources and Utilization of Information Resources (N=800)

Variable	X	SD	r-value	p-level
Selection of information resources	13.62	3.72	.176*	.000
Utilization of information resources	15.04	3.36		

*Significant at p-value, df=798

Hypothesis Three

Weeding of information resources has no significant relationship with the utilization of information resources. The independent variable in this hypothesis is the weeding of information resources, while the dependent variable is the utilization of information resources. To test this hypothesis, Person product-moment correlation analysis was employed. The result of the analysis is presented in Table 4. The result in Table 3 reveals that the calculated r-value of .367 is greater than the critical r-value of .088 at a .05 level of significance with 798 degrees of freedom. With this result, the null hypothesis was rejected. This result implies that the weeding of information resources has a significant relationship with the utilization of information resources.

Table 4. Pearson Product Moment Correlation Analysis of the Relationship between Weeding of Information Resources and Utilization of Information Resources (N=800)

Variable	X	SD	r-value	p-level
Weeding of information resources	13.73	4.30	.367	.000
Utilization of information resources	15.04	3.36		

*Significant at p-value, df=798

Discussion of Findings

This section is concerned with the discussion of findings that emerged from the results of the analysis. The discussion is presented according to the hypotheses of the study.

Acquisition and Use of Information Resources

The finding revealed that there is a significant relationship between the acquisition of information resources and the utilization of information resources. This means that if the library is well stock with current, relevant, quality, and up to the materials, then students are likely to use the library materials for their information needs. This is to say that acquisition of library materials is very key in every library if u must attract the attention of users. The findings is in line with the findings of [11], who stressed that libraries are appraised by the quality and quantity of their collections. It is important that the university libraries acquire current, accurate, relevant, and adequate information resources necessary to support the teaching, learning, and research activities of the university community. Affirming this view, [12] maintained that if the information resources are inadequate for the needs of the students, the library will not be heavily used.

Preservation and Use of Information Resources

The result of the findings indicated that the preservation of information resources has a significant relationship with the utilization of information resources. This means that how well a library is able to keep its collections neat, tidy, and void of decay and dust will influence the decision of students to use the information resources in the library or not. This finding agrees with the findings of [17] who was recommended that deteriorated materials be removed from the shelves and reading rooms as soon as they are noticed and taken to the bindery where they can be appropriately repaired and returned to the shelves to facilitate utilization. Also [21] findings corroborate with the findings of this study as they stressed that if materials are not properly preserved it will give room for deterioration and decay and this will cause students lack of interest in the use of information materials.

Weeding and Use of Information Resources

The findings of this study revealed that Weeding of information resources has a significant relationship with the utilization of information resources. This means that when deteriorated and obsolete materials are removed from the shelves to be replaced with current and up-to-date materials, it awakens the student's interest to make use of library materials. This view is in agreement with the views of Ephraim [25] who affirms that weeding increases access to relevant materials as it frees shelving space from less used materials. This study also confirms the study of [23], who observed that there is a need for collection development to formulate policy on weeding process, to create space, and remove obsolete materials on the shelves.

Summary of Findings

1. There is a significant relationship between acquisition of information resources and utilization of information resources. That is, if the library provides the students with diverse and adequate information resources in print and non-print formats, the students will make use of the information resources.
2. Preservation of information resources has a significant relationship with utilization of information resources. If the librarians protect the information resources from dust, deterioration and from being mutilated to ensure continuity of recorded information, there will be maximum utilization by students.
3. Weeding of information resources has a significant relationship with utilization of

information resources. Meaning, when librarians remove out-dated and irrelevant information resources from shelves to create space for the newly acquired information resources, the time and stress for searching and retrieval will be reduced, and the use of library materials by students will increase.

Conclusion

The quality of the collection remains the litmus test of service delivery effectiveness in the academic library. Acquisition, preservation, and weeding are the strength and the bedrock of any library collection. Librarians must always select and acquire the right information materials for their libraries, and such materials must be properly taken care of in order to attract the attention of users. Hence, librarians must continue to work hard to build a collection that is current and relevant to the information needs of users. This will increase students' interest in the use of library resources in academic libraries in South-South Nigeria.

Recommendation

Based on the findings of the study, the following recommendations were made:

1. Government should prioritize funding for the acquisition of information resources for university libraries.
2. Weeding should be a ''regular exercise" in the "libraries'' to rid the shelves of irrelevant, obsolete, and damaged information resources.
3. Bindery divisions should quickly mend torn but relevant books for effective preservation and prompt replacement on the shelves".

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Conflict of Interest

There is no conflict of interest.

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Cancer Screening Technology and Attitude of Women Towards Cervical Cancer

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Abstract

Cervical cancer claims over a quarter of a million lives of women annually worldwide. It is believed to be the second most common cancer among women worldwide. Screening is used to detect precancerous changes or early cancers before signs or symptoms of cancer occur. The first case of cervical cancer was founded in the 1970s by Harald Zur Hausen. It is believed to be the second most common cancer among women worldwide. Females becoming sexually active in early age with multiple partners are on high risk. Virtually all cervical cancers are associated with human papilloma viruses (HPV). This study was conducted to understand the levels of knowledge and attitudes of women towards cervical cancer screening in Al Khan Dubai.It assessed the knowledge and attitudes of women about cervical cancer prevention. 70% of the sexually active women really need to go for cancer screening. It shows that 66% of women in al khan are being affected due to lifestyle and it is affecting women's decision in relation to cervical cancer screening. To improve cervical cancer screening in al khan area, women should be given more information, motivation, awareness, and sensitization, in order to encourage them to go for a cervical cancer screening.

Keywords*: Cervix, High risk, HPV, Pre-screening methods, Women.*

Introduction

Cervical cancer claims over a quarter of a million lives of women annually worldwide. Nearly 500 000 women worldwide develop cervical cancer each year, making it a serious health issue. Most cases occur in less developed countries without effective screening systems. [1] The first case of cervical cancer was founded in the 1970s by Harald Zur Hausen. It is believed to be the second most common cancer among women worldwide. Since then, women have been trying to battle there lives with this cancer of the cervix. In 2019, UAE recorded the highest cases of cervical cancer in dubai. It is the fourth most commonly occurring cancer in women and the eighth most commonly occurring cancer overall. All types of cervical cancers are due to human papilloma viruses (HPV). Persistent human papillomavirus (HPV) infection is the most important factor in the development of cervical cancer [2]. HPV is common and most people are getting infected when they start having sex with multiple partners and in early age, there are almost 100 types of HPV infections, but all will not lead to cancer, with proper treatment, it can be cured. The fact that HPV is a sexually transmitted infection may lead to anxiety and concerns about sexual relationships [21]. Although it does not develop into cancer in all cases as there is a role of multiple environmental factors which can lead to cancer [3].

Some of the stakeholders who took part in the battle of trying to fight cervical cancer like the World Health Organization (WHO) advocated a comprehensive approach to cervical cancer prevention and control to identify opportunities

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to deliver effective interventions. To date there are 49 screening and treatment sites for cervical pre-cancer care. Cervical cancer mostly affects the middle-aged women, there are multiple screening testing available but still cervical cancer remains the leading cancer in UAE. It is assumed that there are multiple factors such as health behaviors, knowledge, social interaction, and religion which can influence screening and vaccination practices. Recent studies indicate that the number of steady partners and frequent intercourse at early ages may further enhance risk, supporting hypotheses regarding a vulnerable period of the cervix and a need for repeated exposure to an infectious agent [10].

Cervical cancer begins with unusual changes in the tissue. The main factors that contribute to cervical cancer are:

1. Starting to have sex before the age of 16 or within a year of starting menstruation.
2. Having multiple sexual partners.
3. Taking birth control pills, especially for longer than 5 years.
4. Smoking cigarettes.
5. Having a weakened immune system.
6. Having a sexually transmitted disease (STD).

Scope and Significance of the Study

The scope of the study gives a clear summarizing and understanding on the theoretical aims that the researcher wants to accomplish. This study focuses on the causes, effects of cervical cancer such as HPV which is a sexually transmitted virus which causes cervical cancer. Having many sexual partners or becoming sexually active at an early age. Having a weakened immune system, smoking and socio-economic status that appears to be higher in areas where income is low, theses fall under the causes of cervical cancer and the following are the effects which are, changes in sex life, fatigue, menopause, bowel difficulties and bladder difficulties.

The study will help in the present scenario as it will provide information related to Cervical Cancer screening and will also provide key actions on how to deal with the various cervical cancer related issues presented in ai khan. As cervical cancer is highly treatable when detected early, this research study will help other researchers in developing better ways on how to detect pre-cancer and cervical cancer. This study will help to understand the effectiveness of different plans so most of the women will understand the screening benefits, particularly among the less educated women and those in hard-to-reach areas. This study will also help in assessing the levels of knowledge that women have on issues concerning cervical cancer and will also assess the effectiveness of programs put in place to encourage women to undertake screening.

Definition of Key Terms

Cancer

According to the World Health Organization (WHO) cancer is the uncontrolled growth and spread of cells. It can affect almost any part of the body. The growths can metastasize to other parts of the body and internal organs.

Cervical Cancer

According to Wikipedia, cervical cancer is arising due to abnormal growth of cells in the cervix and having the ability to spread to other parts of the body.

Knowledge

As per dictionary, knowledge is information and understanding about a subject.

Attitude

According to Longman Dictionary, attitude is a feeling that you have for something, especially in your behavior.

Screening

According to the World Health Organization (WHO) screening is defined as identification of unrecognized disease in an apparently asymptomatic /symptomatic healthy person by

means of tests, examinations, or other procedures.

Human Papillomavirus (HPV)

According to the NCI dictionary of cancer terms, HPV is a type of virus that can cause abnormal tissue growth (for example warts). Infection for a long time with certain types of human papillomavirus can lead into cervical cancer. Human papillomavirus is not limited to the cervix only, it can lead to anus, vagina, penis, and oropharyngeal cancer.

Infection

According to Wikipedia, an infection is the spread of one or more pathogenic agents by disease-causing agents, their multiplication, and the reaction of host tissues to the infectious agents and the toxins they produce.

Characteristics Of Cervical Cancer

Living with cervical cancer can present new challenges and would affect one in everyday life. Many people feel anxious or depressed and some get angry and resentful. Family members and friends can be supportive, a social worker, counselor or member of the clergy can help. The hospital or medical center might have support groups who would tackle such cases.

Cervical Cancer Screening Technologies

Several effective strategies for cervical cancer prevention have been identified, including cervical cytology using either conventional or liquid-based methods, high-risk (HR) human papillomavirus (HPV) DNA testing, and a variety of iterations of direct visual inspection of the cervix following application of acetic acid (VIA) or Lugols's iodine [22]. New screening technologies intending to become incorporated into highly effective cervical cancer screening programs will require a sensitivity and specificity for the detection of cervical pre-cancer [8]. A practical approach to cancer management involves 4 steps: 1) establish the diagnosis; 2) define the extent of disease; 3) determine and implement treatment; and 4) follow the patient for evidence of recurrence and/or treatment-related complications [5].

Cervical Cancer Prevention and Treatment

The key to preventing invasive cervical cancer is to detect cell changes early before they become cancerous. Regular pelvic exams and Pap tests are the best ways to do so such as getting a Pap test every 3 years once one is 21 or older. [6]. Regular radiology exams and lab tests, especially pap smear, is important for every woman but especially for those who have been diagnosed with any kind of HPV and cervical cancer. Follow ups should be done with the doctor to know the stage of condition. As per member stage of cancer, surgery or chemotherapy is advised. After this, members can keep on oral medicines also. If the cancer is on the cervix, the doctor removes or destroys the cancerous cells with procedures like cold knife colonization. Certain things can ease the physical and mental stresses of cervical cancer and treatment. One of the best things that one would do is get the right nutrition, enough calories and protein which leads to better treatment.

A nutritionist would help to keep up the calorie and protein intake [23]. Failures of cervical cancer prevention efforts are rooted in human factors to which all preventive interventions are vulnerable [7]. Cancer and its treatment can place extra demands on the body, greatly increasing nutrient and caloric needs. Studies of protein metabolism in cancer patients have shown elevations of whole-body protein turnover and skeletal muscle wasting [24]. The improvement of current screening methods therefore has two major goals: First, to offer feasible and affordable screening for the countries that still carry the largest burden of disease, and second to improve the efficiency of current screening programs, to make them more cost-effective by improving the detection of relevant disease [9].

Factors Relating to Cervical Cancer Screening

Cervical cancer is more common among groups of women who are less likely to have access to screening for cervical cancer. It includes mostly black women and women from low-income households. Oral contraceptives which are birth control pills, may be associated with an increase in the risk of cervical cancer. However, it is not, and more work is needed to confirm how contraceptive pills can be a risk factor for cervical cancer. It is given to pregnant women to prevent miscarriage and preterm labor.

If a woman is treated with DES, she has to undergo screening testing for cervical cancer or pelvic examination for checking activation of abnormal cells. Women who smoke are at higher risk, almost double, to develop cancer as compared to the females who are not doing smoking. Cervical cancer not developing in young girls below 20 years, they rarely develops, if getting sexually active with multiple partners. women aged after 30 are on higher risk for developing cervical cancer. Women with lowered immune systems have higher risk of developing cervical cancer. women who are on treatment for certain corticosteroid medicines, underwent organ transplant surgery, have cancer of other parts of the body, or immune system disease like HIV, are having less immunity to fight with disease. Risk for developing cervical cancer in women with Herpes is higher as compared to other women.

There is a lack of knowledge about cervical cancer and screening among both men and women. Several misconceptions exist and many believe that cervical cancer is the result from the use of contraceptives. Due to the lack of knowledge, it is sometimes hard for the women to access screening without relating to symptoms of the disease. The utilization of cervical cancer screening services help to improve women's confidence and promotes patient uptake of care. It helps with an early diagnosis and management of the premalignant lesions of the disease [16].

Attitude towards Cervical Cancer and Screening

The perception towards cervical cancer and screening is basically based on women's beliefs of being at risk and whether or how the disease can be prevented and treated. Though some attribute cervical cancer to the foods they eat and its preparation including the use of polythene bags that are used to cover food when cooking. Other beliefs include having either many or a few children, long use/non-use of sanitary pads [17].

Global Statistics Scenario

Worldwide, cervical cancer comprises approximately 12% of all cancers in women. In developing countries also, the ratio of cervical cancer is high. Annual global estimates around the year 2000 are for 470 600 new cases and 233 400 deaths from cervical cancer annually. Eighty percent of these cases occur in developing countries.

In most countries in North America and Western Europe, the incidence of cervical cancer has been falling although recently at a much slower rate. In many developing countries, cancer of the cervix has changed little in incidence except for those countries that have achieved the demographic transition with increasing affluence from industrialization. In such countries there has been a fall in incidence of cancer of the cervix and a rise in incidence in cancer of the breast similar to changes that occurred in North America and Western Europe in the early part of the last century. Many of the countries that have been through this transition are in the middle-income category [18].

Number of cervical cancers diagnosed in the last 5 years is 14,01400 in the year 2000 compared with 38,60300 for breast cancer, with 10,64000 and 15,22000 of these occurring in developing countries, respectively. Thus, although breast cancer is increasing in importance in many developing countries, cervical cancer remains a major cause of morbidity and mortality [11]. However,

reductions have been quite small recently in many countries with low incidence in the early 1960s including Canada, many parts of the United States and the Caucasian population of New Zealand. In Finland there has been some recent increase in incidence but not in mortality in women aged 25-54 [12]. Cervical cancer was the leading cause of cancer related deaths in women in eastern, western, middle, southern Africa, and UAE. In 2018, almost 570 000 cases of cervical cancer were reported, and 311 000 deaths occurred. China and India are on the highest ranking for cervical cancer, with 106 000 cases in China with 48000 deaths, in India 97 000 cases reported and 60 000 deaths in India.

Globally, diagnosis of cervical cancer was at 53 years of average age, ranging from 44 years to 68 years. Ranging from 45 to 76 years, the global average age of death is 59 years from cervical cancer [13].

Local Statistics Scenario

Cervical cancer which is preventable by screening and vaccination is the most common cancer in Dubai among females. Dubai has a population of 4.42 millions of women aged 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 2994 women are diagnosed with cervical cancer and 1839 die from the disease. Cervical cancer screening started in the year 2006 and the human papillomavirus vaccine was piloted in 2013. It is assumed that knowledge, social interaction, health behaviors and religion are factors that can influence screening and vaccination practices. In Dubai, the National Cancer Registry (NCR) has been poorly funded and understaffed, adding to limited efficiency of cancer registration. In 2008, the NCR was estimated to capture approximately 10-15% of cancer countrywide. The International Agency for Research on Cancer (IARC) estimates age standardized incidence rate of cervical cancer in Dubai at 58.0 per 10 and mortality at 36.2 per 10, making cervical cancer the most common cause of cancer morbidity in women and overall, in Dubai. Studies have shown that the leading factors for cervical cancer in Dubai include the high prevalence of Human Papilloma Virus (HPV) types 16 and 18(21.6% each). Over the course of 7 years (2006-2013), the CDC screening program provided screening to over 100,000 women and established 24 screening sites, 12 in Sharjah town and at least 1 in every provincial headquarters. In late 2006, a new cancer hospital, the Cancer Disease Hospital (CDC) was opened in dubai for radiotherapy and chemotherapy treatment. Less than half of the women had heard of cervical cancer, 20.7% of women had attended screening and 6.7% had vaccinated their daughters. Despite the figures, the knowledge of causes and prevention is very low. It has been discovered that there is a need to increase the knowledge and awareness among both men and women. The relative risks of cervical cancer following HPV infection as ascertained in case-control and cohort studies are among the highest in cancer epidemiology [25].

The main objective of the study is to understand the levels of knowledge and attitudes of women towards cervical cancer screening in Al Khan Dubai.

1. To find out the community perception on the effectiveness of programs put in place to encourage women to undertake screening
2. To find out factors affecting women's decisions relating to cervical cancer screening
3. To provide recommendations for promoting screening of cervical cancer.

Literature Review

Overview

This chapter features the review of related literature to the area of study. According to Carol (2010), literature is reviewed against the backdrop of key study variables. The Knowledge and attitude of women towards screening of cervical cancer is discussed. The chapter also outlines the theoretical framework of the study and conceptual framework [3]. This chapter is important because it has helped the

researcher to understand better on the topic of study through the review of previously related work. It has also assisted the researcher to limit the research problem in order to define it better and come up with much more important specific goals and research questions to suit the current study. Literature review helped the researcher to use different methods with a variety of research methodologies as used by other researchers.

Francesca DE Felice (2019, 16th October), studied under the title of knowledge, attitudes and practices towards cervical cancer and screening amongst female health care professionals. Cervical cancer is curable and preventable disease if proper treatment and strategies will be applied, if not, it can result in underutilization of the preventive strategies. The questionnaire was developed from previously published studies after an in-depth literature review and then validated through experts. Results proved that most of the participants were not aware about cervical cancer and most of the participants showed lack of correspondence for all the statements in this section based on the attitudes towards cervical cancer. There is a need for healthcare providers to be proactive in promoting women's health and preventing the disease [3].

Luani Rezende Godoy (2022, January), studied under the title knowledge, attitude, and practice towards Cervical Cancer. First prevention is vaccination against HPV and secondly as population-based screening. Despite preventive measures, The American Cancer Society estimates 14,480 new cases and 4290 deaths by this tumor among women in the USA in 2021. Radical hysterectomy is now considered to be the first line of treatment in the early stage (4).

Owoeye I.O.G (2013, 12th January), studied under the title knowledge and attitude towards cervical cancer screening among female students and staff in a tertiary institution. Cervical cancer is a largely preventable disease. Due to implementation and effectiveness of cervical screening programs, in western countries, the incidence of and mortality associated with cervical cancer has been reduced. This study shows the knowledge, level of perception and the attitude of female staff and students. Most of the participants, 278 (72%) were aware of cervical cancer, while only 182 (50.6%) were aware of cervical cancer screening. The state government needs to implement policy on screening for cervical cancer with appropriate screening guidelines [5].

Shimeles Tsegaye (2018, 26th June), studied under the title knowledge and attitude towards cervical cancer screening. Cancer of the cervix is the leading cause of cancer-related death next to breast cancer. Screening of cervical cancer helps in detection and treatment of the problem before it develops into an advanced stage. A cross-sectional study conducted using simple random sampling techniques was conducted for one month. Out of the total of 422 study participants, 42 returned the questionnaires incomplete and with an inconsistent response, the analysis was done on the remaining questionnaires making the overall response rate of 90%. More effort must be invested to increase awareness and improve the attitude about cervical cancer screening [6].

Ghufran Jassim (2018), A cross-sectional study of 300 women attending primary health care centers was conducted. Data was collected through face-to-face interviews between December 2015 and February 2016. The participants were between 37 and 50 years, they were mostly married (221; 73.7%), and had a high school or higher education (261; 87%). Over 64% (194 participants) had never heard of a Pap smear procedure and only 3.7% (11 participants) had heard about the human papillomavirus (HPV) vaccine. The study shows that there is need to establish a sustainable awareness campaign concerning the prevention of cervical cancer, and further emphasizes the importance of a nationwide population-based screening program across primary health care centers [7].

Temesgen Tilahun (2019), studied under the title knowledge, attitude, and practice of cervical cancer screening. This study aimed to assess the knowledge, attitude and practice of cervical cancer screening and associated factors among female students of Wollega University. A pre-tested structured questionnaire was developed for data collection, after reviewing similar literature. More than half, 54.4%, of participants had heard about cervical cancer and its risk factors. Only 35.8% knew about screening procedures such as Pap smear (61.1%) and visual inspection with application of acetic acid (38.8%). Different governmental and nongovernmental stakeholders need to give special attention on raising awareness about cervical cancer, its screening and preventive strategies [7].

Carlo A. Liverani (2020), studied under the title knowledge, attitude, and practice of cervical cancer screening. The most recent ACS guideline calls for substantial changes to the screening method: the ACS recommends that individuals with a cervix initiate cervical cancer screening at age 25 y and undergo primary HPV testing every 5 years through age 65year. women with positive HPV, direct referral to colposcopy is not recommended, first cytology is recommended. The European council recommends organization of screening programs and awareness, despite consistent evidence they have not yet implemented a nationally organized cervical cancer [8].

Research Methodology

Formulation of the Research Problem

The researcher formulated the research problem by observing the increase of cervical cancer cases in Dubai since the last statistics estimates indicate that every year 2994 women are diagnosed with cervical cancer and 1839 die from the disease. The researcher took interest in this study due to the demand of women going to hospitals to check for cervical cancer and the increase in awareness programs through social media and TV programs.

In Dubai currently, the situation of women is a major source of concern towards screening of cervical cancer. Most of the women lack the knowledge due to being uneducated and lack of awareness programs in communities. Hence provision of health care facilities conducting cervical cancer screening be it in rural and urban areas will help women to improve on the knowledge of conducting cervical cancer screening in al khan.

Research Design

The research design is a conceptual structure for the collection and analysis of data in a way that relates to the methodology with the purpose of study (Singh y 2013). It is the blueprint for the collection and analysis of data that gives a sense of direction for the research process (Kothari 2005). Descriptive research design is used to obtain information concerning the status of the phenomena and to describe what exists with respect to variables or conditions in a situation [8]. The design is suitable for the target population who are widely spread across the geographical area of division. The researcher will use descriptive method in order to collect data which is convenient in social science to describe phenomena that have existed and helps to provide answers to the questions of who, what, when, and how associated with a particular research problem.

The universe is a population that is ethologically selected for the purpose of targeting selected women for the research. In this case, the population is the entire group of women from which the researcher needs to obtain information. The universe in this scenario is the women in Dubai in al khan. The main focus for the research is to understand the knowledge and attitude of women towards screening of cervical cancer.

Sampling Procedure and Size

The researcher used a probability sampling procedure to select respondents. Probability sampling technique involves the researcher

choosing samples from a larger population using a method based on the theory of probability [9]. Random selection of participants gives best results of sampling among the population and can employ statistical techniques like confidence intervals and margins of error to validate the results. The researcher used this technique because it uses lesser reliance over human judgment which makes the overall process free from biasness [9].

Population chosen for a survey or experiment in a statistical sample. The respondents of this study were 50 women in al khan.

Sources of Data and Area

The sampling area of this research was in Sharjah in al khan, this is where the respondents of inquiry will come from and all the necessary and relevant data about the research will be collected.

The data was collected from both primary and secondary sources. From primary sources information will be gathered from tools such as questionnaires, personal interviews, group discussions and observations. Secondary data collection involved collecting information from journals, newspapers, textual and report. A primary data source is the original data source for the study. During primary data collection, information was gathered from tools such as the researcher getting involved in the distribution of questionnaires to selected persons from national and community level, interviews and lastly through observations. With secondary data collection, information collected from the internet, journals, newspapers and both previous and current reports which will help in gathering accurate information.

Methods and Tools of Data Collection

The method that the researcher used for interviews will help overcome most of the shortcomings by allowing the researcher to make them understand the views of respondents' and their answers.

The semi structured questionnaire designed with both open-ended and closed questions that allow the generation and analysis of qualitative data was used. For example, a survey might be used to investigate not just which political candidate a voter chooses but why they chose them in their own words [10].

Tools of Data Analysis

The data analysis is based on the objective of the support of SPSS 17.3. SPSS (Statistical Package for the Social Sciences) is used by various kinds of researchers for complex statistical data analysis. The SPSS software manages and does statistical analysis of social science data. SPSS is used by all kinds of researchers and many more for the processing and analyzing of survey data [10]. This software package is used for logical batched and non-batched statistical analysis by which highly complex data manipulation and analysis with simple instructions can be performed.

Limitations of the Study

During the research process, the researcher found difficulties in finding information on local statistics on certain details relating to the factors, especially local scenarios in al khan and the researcher couldn't collect the appropriate information from the internet due to the slow internet network. Others were willing to participate but did not give detailed information, whilst others did not answer the questionnaires as required. The study was aiming for the females and yet some of the males won't be able to have knowledge on the causes of cervical cancer.

Data Analysis and Interpretation

Table 1. Distribution of respondents according to Age

Response	Frequency	Percent
14-17 years old	7	14.0
18-24 years old	12	24.0
25-34 years old	17	34.0
35-50 years old	14	28.0
Total	50	100.0

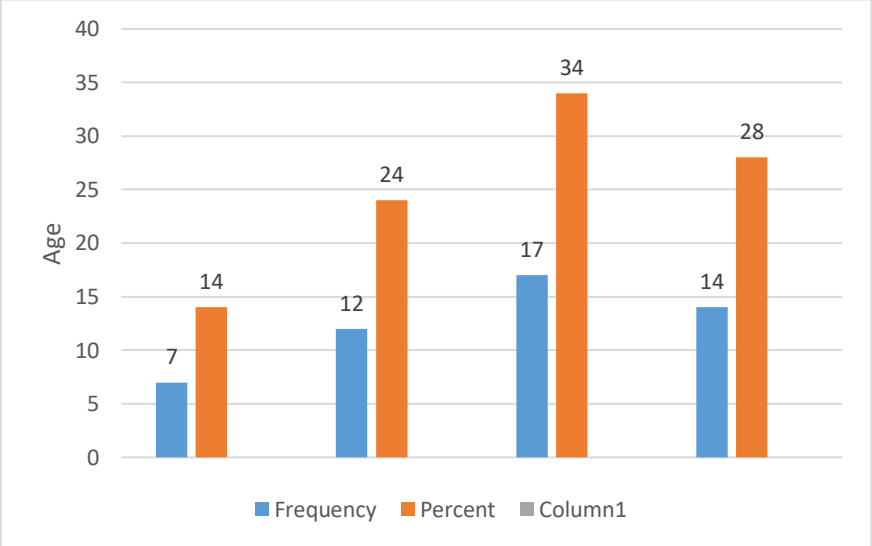

Figure 1. Distribution of Respondents according to Age

Table and figure 1 Gives the distribution of respondents according to the age groups of women al khan. The distribution of respondents regarding age considered four variables: 14-17 years 7 women which is 14%, 18-24 years 12 women which is 24%, 25-34 years 17 women which is 34%, 35-50 years 14 women which is 28%. The data is from a sample size of 50.

Table 2. Distribution of Respondents according to Marital Status

Response	Frequency	Percent
Married	20	40.0
Single	22	44.0
Divorced	6	12.0
Widow	2	4.0
Total	50	100.0

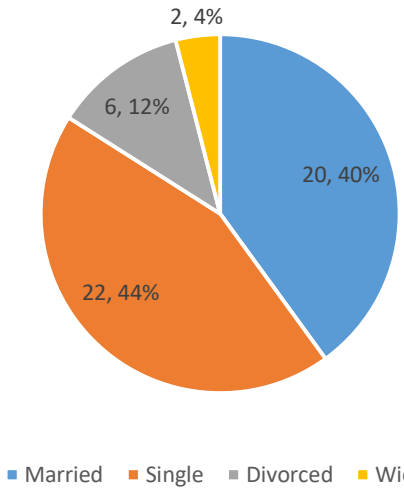

Figure 2. Distribution of Respondents according to Marital Status

Table and Figure 2 describe the distribution of respondents according to their marital status. There are four variables considered, which is the married 40%, single 44%, divorced 12% and widow 4%. In al khan most women are single, and the study concluded that most respondents were single.

Table 3. Distribution of Respondents according to Form of Employment

Response	Frequency	Percent
Yes	32	64.0
No	18	36.0
Total	**50**	**100.0**

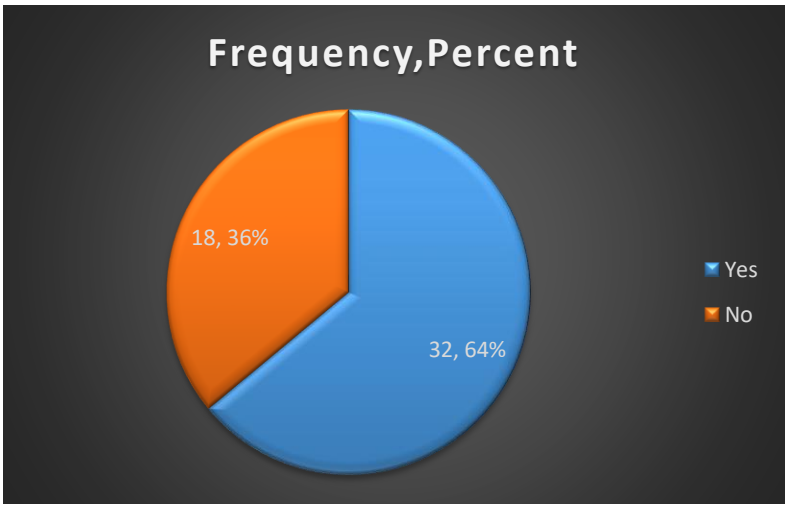

Figure 3. Distribution of Respondents according to Form of Employment

Table and figure 3 Show the distribution of respondents according to their form of employment. There are two variables which are yes 64% and no 36%. In the chart above we see that the number of people who are in any form of employment is high.

Table 4. Distribution of Respondents according to the Previous Question is yes, what form of Employment are you in?

Response	Frequency	Percent
Government Sector	9	18.0
Private Sector	11	22.0
Self-employed	30	60.0
Total	50	100.0

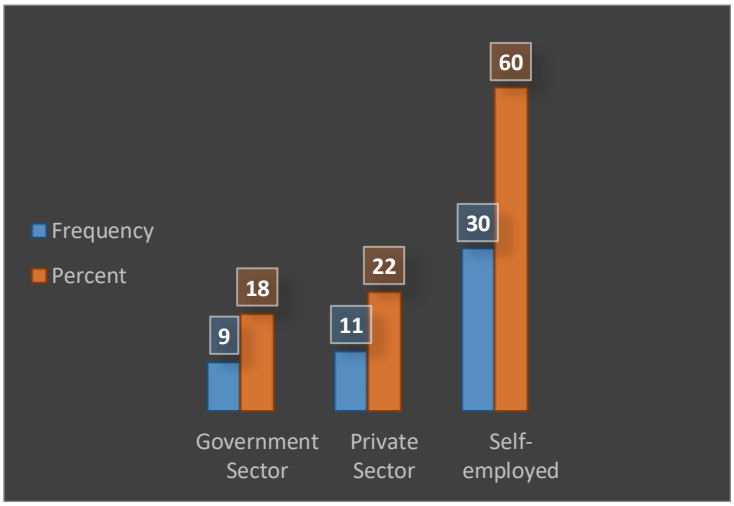

Figure 4. Distribution of Respondents according to what Form of Employment are you in?

Table and figure 4 show the distribution of respondents according to the form of employment. There are three variables which are government sector 18%, private sector 22%, and self- employed 60%.

Table 5. Distribution of Respondents according to Awareness of Cervical Cancer Screening

Response	Frequency	Percent
Yes	36	72.0
No	14	28.0
Total	50	100.0

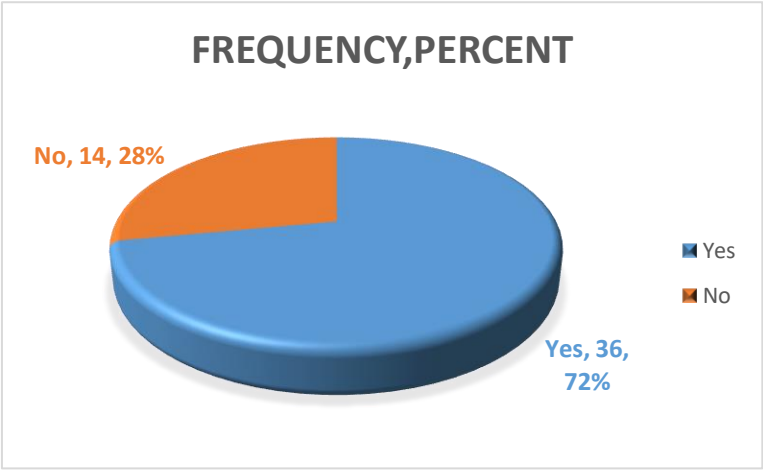

Figure 5. Distribution of Respondents according to Awareness of Cervical Cancer Screening

Table and figure 5 show the distribution of respondents according to their awareness of cervical cancer screening. There are two variables which are yes 72% and no 28%. The chart clearly shows that several women are aware of cervical cancer screening and the number is quite higher than the women who have no idea about cervical cancer screening.

Table 6. Distribution of Respondents according to Knowing about Cervical Cancer Screening

Response	Frequency	Percent
Adequate Knowledge	12	24.0
Little knowledge	29	58.0
No idea	9	18.0
Total	50	100.0

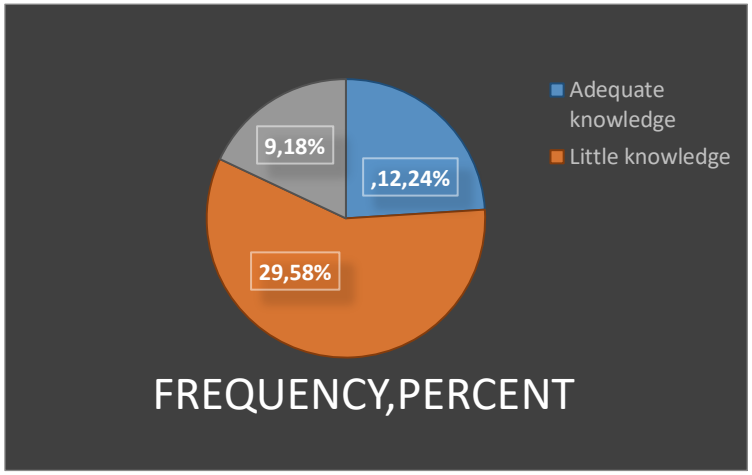

Figure 6. Distribution of Respondents according to Knowing about Cervical Cancer Screening

Table and figure 6 describe the distribution respondents according to knowing about cervical cancer. There are three variables that have been considered which are adequate knowledge 24%, little knowledge 58% and no idea 18%.

Table 7. Distribution of Respondents according to Having Screened for Cervical Cancer

Response	Frequency	Percent
Yes	27	54.0
No	23	46.0
Total	50	100.0

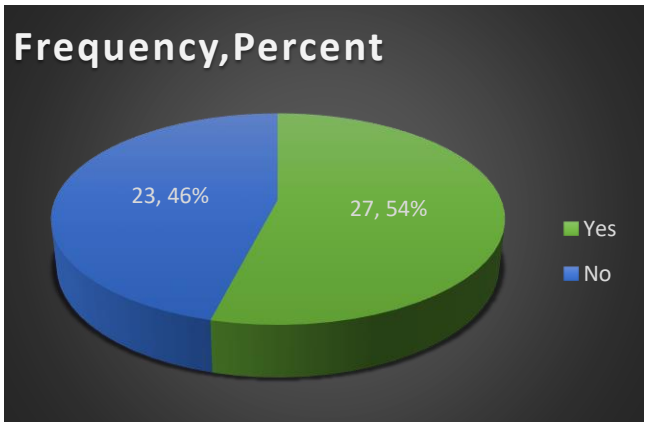

Figure 7. Distribution of Respondents according to having Screened for Cervical Cancer

Table and figure 7 show the distribution of respondents according to having screened for cervical cancer. There are two variables which are yes 54% and no 46%.

Table 8. Distribution of Respondents according to how many times one has been Screened

If the answer to the previous question is yes, how many times?		
Response	**Frequency**	**Percent**
Once	24	48.0
Twice	10	20.0
Three	7	14.0
More	9	18.0
Total	50	100.0

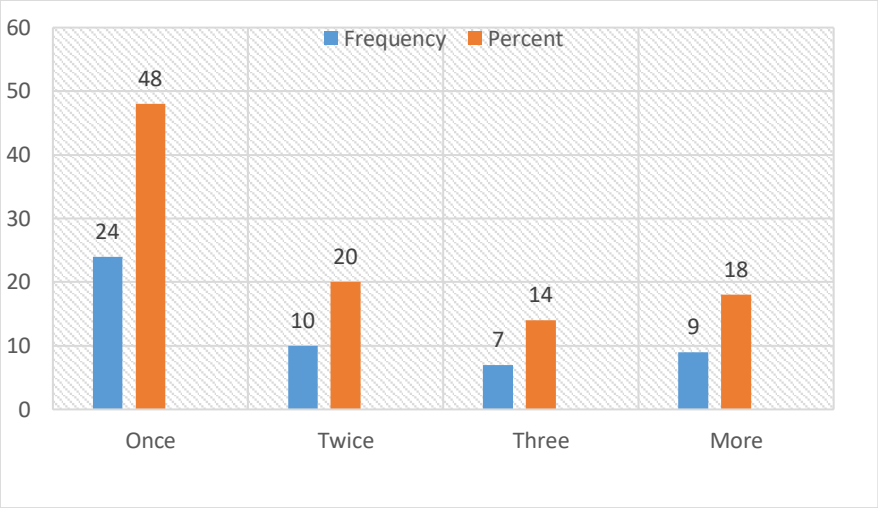

Figure 8. Distribution of Respondents according to how many times one has been Screened

Table and figure 8 describe the distribution of respondents according to how many times one has been screened. There are four variables that have been taken into account, which are once 48%, twice 20%, three 24% and more 18%.

Table 9. Distribution of Respondents according to Attitude towards Cervical Cancer Screening

What is your attitude towards cervical cancer screening?		
Response	**Frequency**	**Percent**
Positive	19	38.0
Negative	18	36.0
Neutral	13	26.0
Total	50	100.0

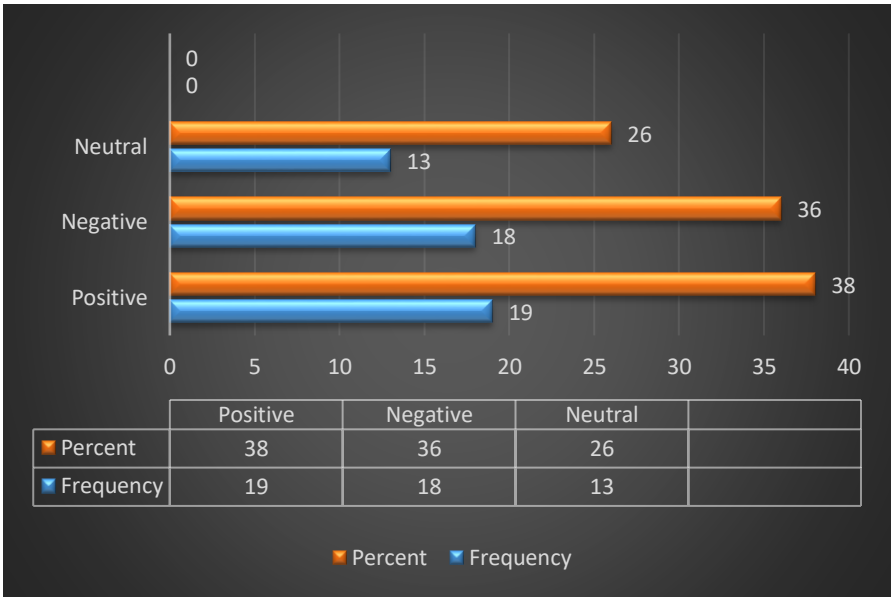

Figure 9. Distribution of Respondents according to Attitudes towards Cervical Cancer Screening

Table and figure 9 describe the distribution of respondents according to attitudes towards cervical cancer screening. There are three variables that have been taken into account which are the positive 38%, negative 36% and neutral 26%.

Table 10. Distribution of Respondents according to the Communities' Attitude towards Cervical Cancer Screening

What is the communities' attitude towards cervical cancer screening?		
Response	**Frequency**	**Percent**
Positive	8	16.0
Negative	14	28.0
Neutral	28	56.0
Total	50	100.0

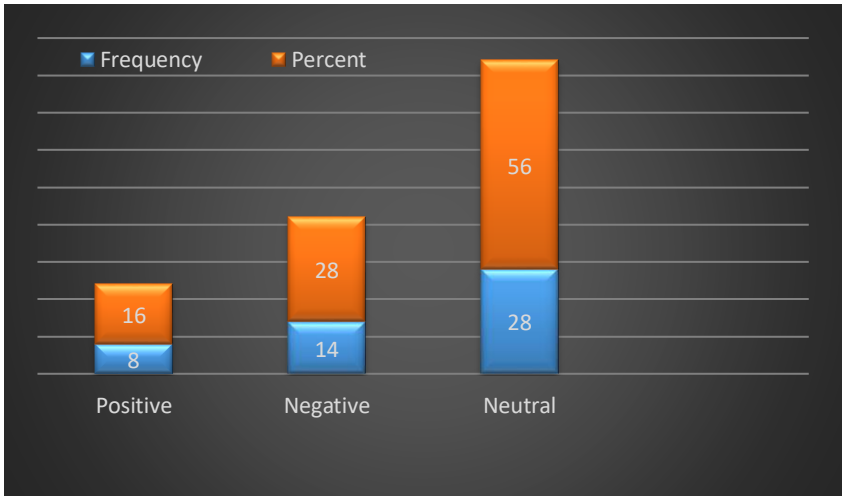

Figure 10. Distribution of Respondents according to the Communities' Attitude towards Cervical Cancer Screening

Table and Figure 10 describe the distribution of respondents according to the communities' attitude towards cervical cancer screening. There are three variables that have been taken into

account which are positive 16%, negative 28% and neutral 56%. The chart clearly shows that most of the women, which is 56%, have a neutral attitude towards cervical cancer.

Table 11. Distribution of Respondents according to the Causes of Cancer

What are the causes of cancer?		
Response	**Frequency**	**Percent**
Age	4	8.0
Lifestyle	33	66.0
Gender	9	18.0
Other	4	8.0
Total	50	100.0

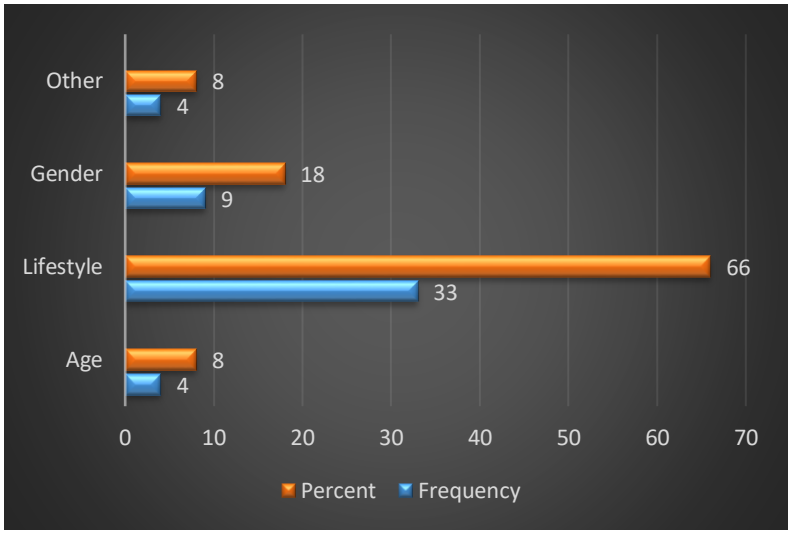

Figure 11. Distribution of Respondents according to the Causes of Cancer

Table and figure 11 show the distribution of respondents according to the causes of cancer. There are four variables which are age 8%, lifestyle 66%, gender 18% and other 8%.

Table 12. Distributions of Respondents according to the Dangers of cancer

What are the dangers of cancer?		
Response	**Frequency**	**Percent**
Death	31	62.0
Spreads to other body parts	17	34.0
Other	2	4.0
Total	50	100.0

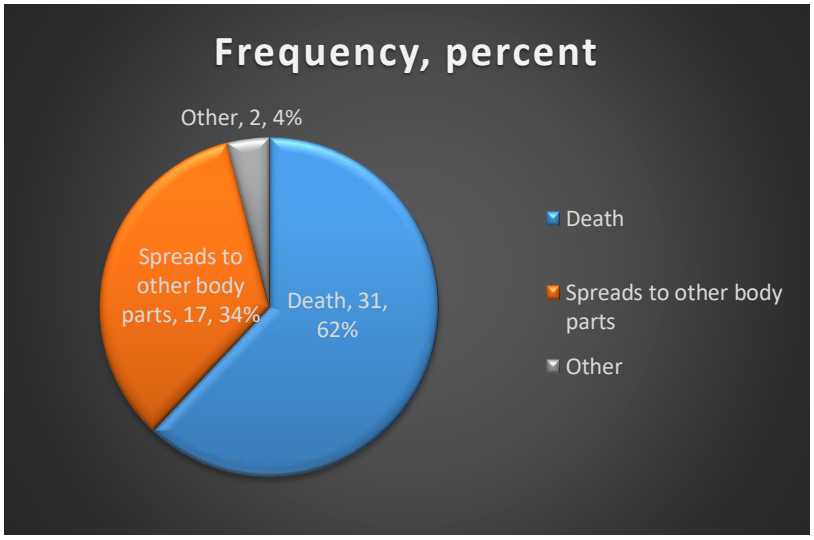

Figure 12. Distribution of Respondents according to the Dangers of Cancer

Table and figure 12 show the distribution of respondents according to the dangers of cancer. There are three variables which are as follows- death 62%, spread to other body parts 34% and other 4%.

Table 13. Distribution of Respondents according to where one Learnt about Cervical Cancer Screening

Where did you learn about cervical cancer screening?		
Response	**Frequency**	**Percent**
Friends	11	22.0
Social media	13	26.0
Hospital	21	42.0
Close relatives	5	10.0
Total	50	100.0

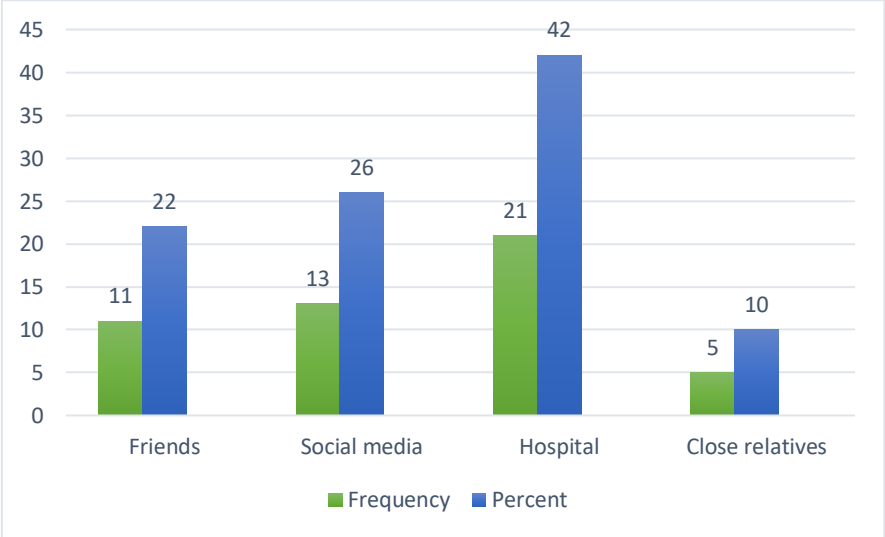

Figure 13. Distribution of Respondents according to where one Learnt about Cervical Cancer

Table and figure 13 show the distribution of respondents according to where one learnt about cervical cancer. There are four variables which are as follows- friends 22%, social media 26%, hospital 42% and close relatives 10%. In the chart above it shows clearly that the hospital

which has 42% indeed plays an important role in the community by helping to teach about cervical cancer and encourage more screening among women.

Table 14. Distribution of Respondents according to the Category of Women should go for Cervical Cancer Screening

From the knowledge acquired, what category of women should go for cervical cancer screening?		
Response	**Frequency**	**Percent**
Married Women only	2	4.0
Single Women	6	12.0
Sexually active Women	35	70.0
Other	7	14.0
Total	50	100.0

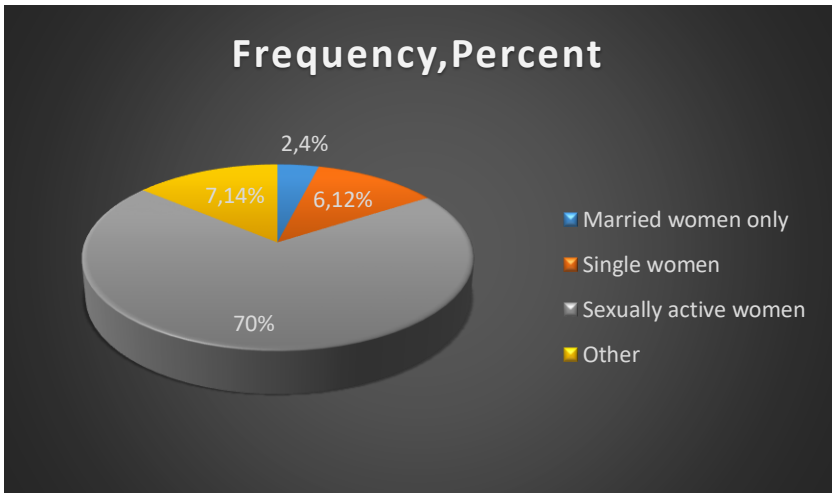

Figure 14. Distribution of Respondents according to the Category of Women should go for Cervical Cancer Screening

Table and figure 14 describe the distribution of respondents according to the category of women who should go for cervical cancer screening. There are four variables considered which is the married women only 4%, single women 12%, sexually active women 70% and other 14%. The chart clearly shows that 70% of the sexually active women really need to go for cancer screening.

Table 15. Distribution of Respondents according to the Decision made to go for Cervical Cancer Screening

Why did you decide to go for cervical cancer screening?		
Response	**Frequency**	**Percent**
Health reasons	17	34.0
To know the cervical cancer status	17	34.0
Influence from close relatives	10	20.0
Other	6	12.0
Total	50	100.0

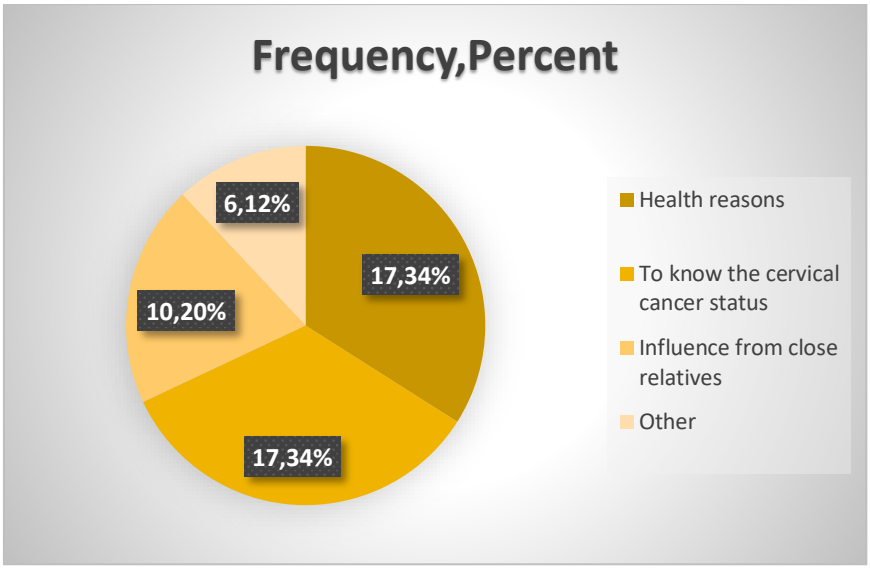

Figure 15. Distribution of Respondents according to the Decision made to go for Cervical Cancer Screening

Table and figure 15 describe the distribution of respondents according to the decision made to go for cervical cancer screening. There are four variables considered which are the health reasons 34%, to know the cervical cancer status 34%, influence from close relatives 20% and other 12%.

Table 16. Distribution of Respondents according to the Benefits of Cervical Cancer Screening

What are the benefits of cervical cancer screening?		
Response	**Frequency**	**Percent**
To have a healthy sexual life	11	22.0
To detect cancer early	17	34.0
To live a healthy life	22	44.0
Total	50	100.0

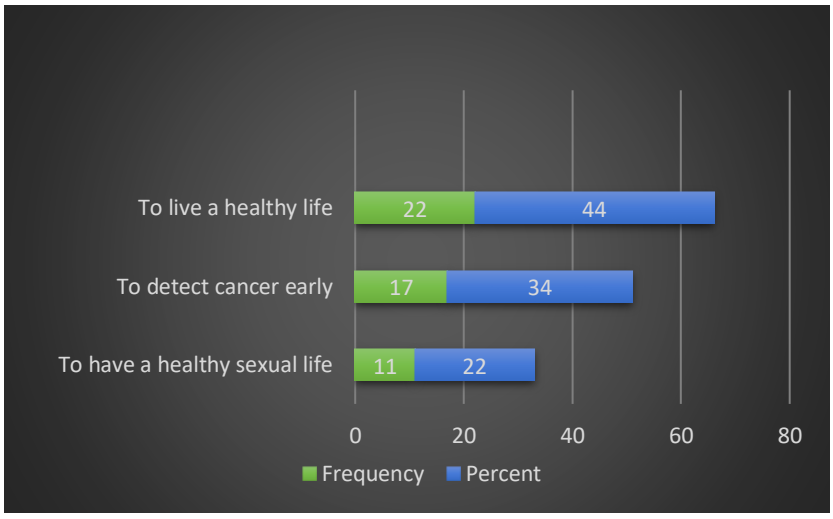

Figure 16. Distribution of Respondents according to the Benefits of Cervical Cancer

Table and figure 16 show the distribution of respondents according to the benefits of cervical cancer. There are three variables which is to have a healthy sexual life 22%, to detect cancer early 34% and to live a healthy life 44%.

Table 17. Distribution of Respondents according to being Aware of any Programs Dealing with Cervical Cancer Screening in the Area

Are you aware of any programs dealing with cervical cancer screening in your area?		
Response	**Frequency**	**Percent**
Yes	32	64.0
No	18	36.0
Total	50	100.0

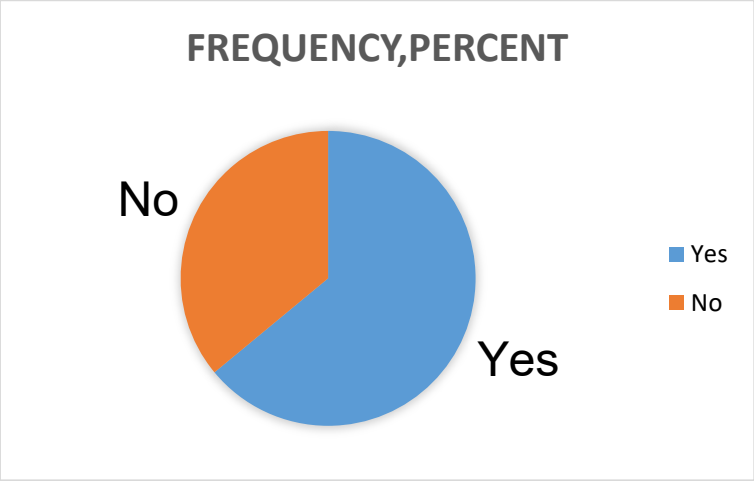

Figure 17. Distribution of Respondents according to being aware of any Programs dealing with Cervical Cancer Screening in the Area

Table and figure 17 describe the distribution of respondents according to being aware of any programs dealing with cervical cancer screening in the area. There are two variables that have been considered which are yes 64% and no 36%.

Table 18. Distribution of Respondents according to type of Programs they Offer

If the answer to the previous question is yes, what type of programs do they offer?		
Response	**Frequency**	**Percent**
Awareness services	19	38.0
Support groups	9	18.0
Counseling	16	32.0
Other	6	12.0
Total	50	100.0

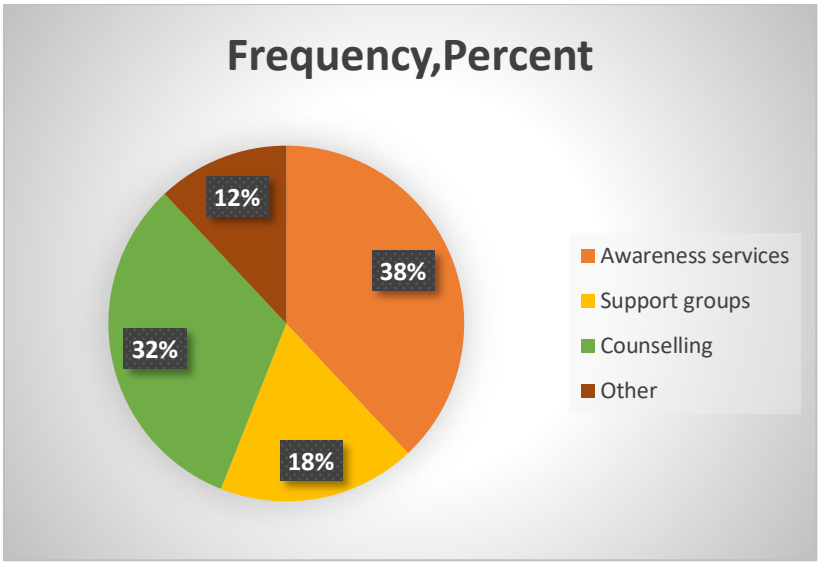

Figure 18. Distribution of Respondents according to type of Programs Offered

Table and figure 4:18 describe the distribution of respondents according to the type of programs offered. There are four variables that have been considered which is awareness services 38%, support groups 18%, counseling 32% and others 12%.

Table 19. Distribution of Respondents according to these Programs being Effective

Have these programs been effective?		
Response	**Frequency**	**Percent**
Yes	29	58.0
No	21	42.0
Total	50	100.0

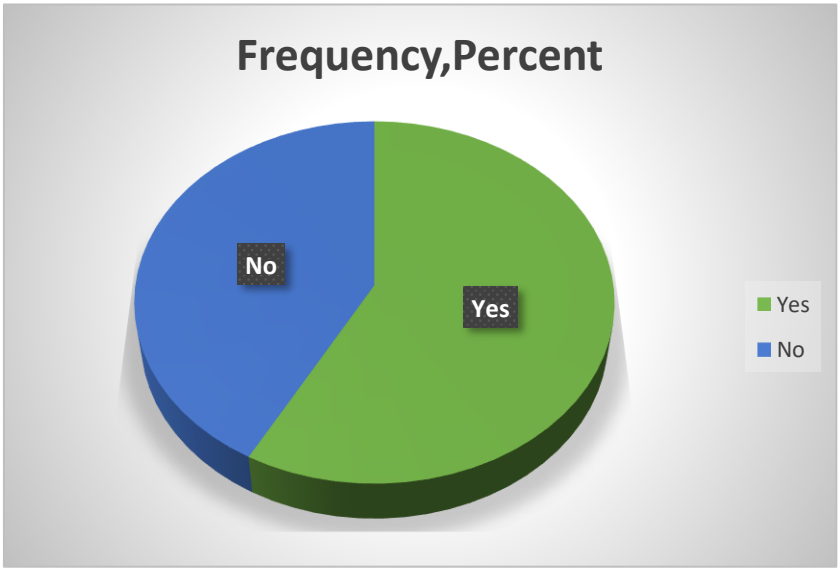

Figure 19. Distribution of Respondents according to Programs being Effective

Table and figure 19 describe the distribution of respondents according to programs being effective. There are two variables that have been considered which is yes 58% and no 42%.

Table 20. Distribution of Respondents according to the Access of Programs

Are you able to access those programs?		
Response	**Frequency**	**Percent**
Yes	28	56.0
No	22	44.0
Total	50	100.0

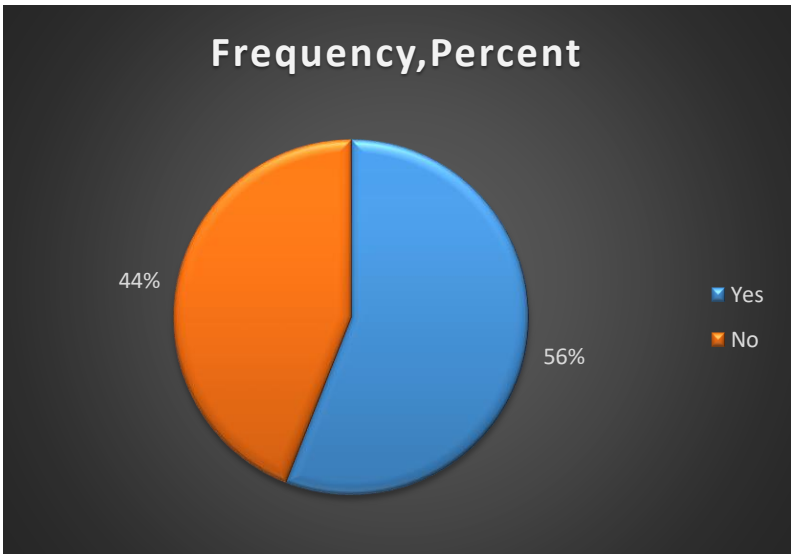

Figure 20. Distribution of Respondents according to Access to Programs

Table and figure 20 describe the distribution of respondents according to access to programs. There are two variables that have been considered which are yes 56% and no 44%. This clearly shows that 56% of the women have access to programs of cervical cancer screening while 44% can't access the programs.

Discussion

Attitudes of women towards cancer screening Based on the general attitude towards cancer screening, it was found that 38% of the respondents being the majority showed a positive attitude towards cancer screening while 36% showed that they had a negative attitude towards screening. The least being 26% who were neutral about cervical cancer screening. This clearly shows that women of al khan have a positive attitude towards cervical cancer screening. In relation to the communities' attitude towards cervical cancer screening, 16% of the respondents claimed to have a positive attitude while 28% showed that they had a negative attitude. The least being 56% showed that the communities' attitude towards cervical cancer screening was neutral. Knowledge women have concerning cervical cancer Based on the general knowledge level concerning cervical cancer it was found that 72% of the respondents being the majority had knowledge on cervical cancer while the remaining 28% of the respondents showed that they did not have any general knowledge about cervical cancer screening.24% of the women claimed to have adequate knowledge of cervical cancer screening while 58% had little knowledge about cervical cancer and 18% showed to have no idea about cervical Cancer. This clearly shows that women of al khan have little knowledge about cervical cancer screening and a small group of 18% had no idea about cervical cancer. Community perception on the effectiveness of programs It was found that 58% of the programs were effective to the community while the remaining 42% believed to say that the programs weren't effective. In relation to programs being effective the access of the programs also follows in which shows that 56% of the respondents had

access to the programs while 44% didn't. %. This clearly shows that 56% of the women have access to programs of cervical cancer screening while 44% can't access the programs.

Factors Affecting Women's Decision

It was found that 8% of the respondents were affected by age, 66% of the respondents were affected by lifestyle, 18% were affected by gender and others were affected by 8%. This clearly shows that 66% of women in al khan are being affected due to lifestyle and it is affecting women's decision in relation to cervical cancer screening.

Conflict of Interest

there is no conflict of interest noted.

Result

There is a need to improve the nature of cervical cancer screening in al khan area and the women should be given more information, motivation, awareness, and sensitization that would encourage them to go for cervical cancer screening. The most reasons for low practice of screening are health and lack of information. The government should play its part by increasing health care budgets and put priority on cervical cancer prevention by establishing a national awareness campaign, spreading screening services all over the country using cheap screening procedures that have shown to have reasonable sensitivity and specificity [20].

The formation of associating with each other in a group helps women to become part of the civil society and can have a louder voice when advocating on policies that will benefit their health lives.

Acknowledgement

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Evaluating the Implementation of Components of the Performance Management System in the Zambian Public Service: A Case Study of Development Bank of Zambia

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Abstract

The Government of the Republic of Zambia has been undertaking public sector reforms beginning with Ministries and cascading to State Owned Enterprises such as the Development Bank of Zambia whose main thrust has been to improve service delivery by introducing performance management systems. The Bank has been implementing performance management systems since 2015. Despite these efforts, the Zambian public service is considered inefficient in its quest to deliver services. This study was conducted at Development Bank of Zambia in Lusaka, Zambia. Therefore, the aim of the study was to Evaluate the Implementation of Components of the Performance Management System in the Zambian Public Service: A Case of the Development Bank of Zambia. The study also sought to determine the origins of the concept performance management, define the concept, describe the approaches to performance management, the nature and content of a performance management system, outline the steps to be followed in developing a performance management system, identify the objectives and benefits of implementing the performance management system, identify the general problems associated with the implementation of the performance management system and make recommendations on how to improve the implementation of performance management and suggest areas for further research.

Keywords*: Public Sector Reforms, Performance Management System, Service Delivery, Zambia.*

Introduction

In reviewing literature on the performance and performance management of workers in the Zambian Public Service, the researcher analysed in detail the "strategic performance model". The various components of the theoretical model which include individual attributes and behaviours, organizational strategy, situational constraints, and the dimensions of performance were highlighted. The researcher also provided justification in the use of the performance theoretical framework which guided the study. The researcher also focused on human resource management in analysing literature and the need to create a fit between the worker, the job, the organization and the working environment. The researcher also discussed the value of human resources practices in enhancing employee performance through increasing employee's knowledge, skills and abilities. The study also discussed the need to average worker's attributes and behaviours for the benefit of the government/organisation through motivation. The literature reviewed therefore showed that PMS was a system that was often used to manage performance in an organization, which begins with planning of work through the setting of performance standards.

The setting of these standards is done in a participatory manner where all employees make contributions. It also includes motivation of employees, coaching them and provision of feedback, on performance measurement and evaluation. The analysed literature showed that

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for PMS to be successful there was need for employee participation or involvement and commitment in all its aspects. Top management involvement, commitment and leadership on the strategy, goals, measures, and performance targets to be implemented were also highlighted as being important in guaranteeing the effectiveness of the PMS. The analysed literature also revealed that aspects of the strategic performance model are key drivers of human resource performance. Individual attributes, individual behaviour, human resource performance, situational constraints were factors that impacted on employee performance in different ways.

However, given the fact that no extensive studies or papers have been done in the field of PMS in Africa, in general, and in the Zambian context in particular, it was imperative to fill that gap in literature. In fact, little has been researched or published on the introduction of performance management systems or the evaluation of the implementation of components of PMS in the Zambian Public Service with special reference to the Development Bank ok of Zambia. The study, therefore, was largely based on original research combined with secondary data set out and evaluated identified components of PMS in the Zambian Public Service (Development Bank of Zambia) using stratified random sampling method.

Methods

Research methodology has been noted to cover research methods, research setting, unit of analysis, population sample and data collection instruments. The procedure followed to administer survey questionnaires has been described in this study as stratified random sampling. Measures put in place to ensure trust worthiness of the study findings have been highlighted. The ethical principles that were compiled with in order to safeguard the rights of the various respondents and aspects of research data storage and destruction have also been noted.

Research Design

In conducting any empirical study, a research design must be chosen first. A research design refers to a plan or blueprint or strategy for conducting an empirical study [1] and [2]. The research design forms a basis for the planning of a scientific inquiry or investigating a given research problem. It could also be viewed as a blueprint for achieving the aims of the research and objectives which assist in answering the research question [3]. A research design is considered essential to a researcher as is a building plan to a builder [1]. There are two basic research designs that are usually used to conduct research of an empirical nature. These are qualitative and quantitative research designs. Mixed methods research design has also in the recent times gained prominence as an alternative method to qualitative and quantitative research designs [4]. This study used a mixed methods research design.

Mixed Method Research Design

[4] views mixed methods research as a research design that combines both qualitative and quantitative approaches, methodologies, techniques, and paradigms in a single study. This is done in order to have an in-depth understanding of the research problem. Mixed methods research is also known as the third methodological movement “or third research paradigm” because it emerged after qualitative and quantitative research [4]. A mixed method research design was selected in this study. This approach was best suited to answer the research problem and questions of the study that may not be adequately studied by either using qualitative or quantitative research methodologies on their own [4]. The topic for this study deals with a complex and multidimensional concept of performance management which requires the adoption of mixed methods research or multiple methods to be adequately studied. [4] stated that mixed methods research is suitable for studies that are exploratory, descriptive, and explanatory.

This study required the use of mixed research methods. Further mixed methods research is appropriate for studies that require a second research method to strengthen the primary research method and use an analytical framework to organize and guide the study [4]. This study collected data through the administering of questionnaires. Personal interviews were later conducted as follows up to the questionnaire to clarify data or issues that could have been unclear. The model of social programmes was used as an analytical framework for the study. This framework helped in organizing and guiding the study. Studies have revealed additional advantages of using mixed research methods. Firstly, mixed methods research leverages on both the strengths of qualitative and quantitative research to offset the weakness in each of the approaches [4]. The approach also lends itself to gathering more evidence for studying a research problem than either qualitative or quantitative research alone. Mixed methods research uses multiple data sources to study research problems [4]. It assists in answering research questions that cannot be answered using only one research method i.e.: qualitative or qualitative research method. Mixed research method is used to compare, contrast, expand, complement, validate, or refute study findings obtained using a different research method [4]. Mixed research methods are known to bridge the divide between qualitative and qualitative research [4]. Additionally, mixed research method encourages researchers to use multiple perspectives or paradigms rather than sticking to those that are associated with either qualitative or quantitative research. This study used a multi – paradigmatic approach to study the phenomenon. It used perspectives and theories of program implementation, organization theories, employee motivation theories and institutional theories to explain the research problem. [5] consider mixed methods research as practical or natural because researchers use both qualitative (words) and quantitative (numbers) and inductive and deductive research to answer research questions.

Analytical Framework

The analytical framework selected for this study was the model of social programmes. [6], an analytical framework is an orientation or general way of looking at phenomenon presented for consideration. The social intervention programme, which is the PMS introduced in the Zambian Public, was the unit of analysis. This study aimed at evaluating the implementation of components of the PMS in the Development Bank of Zambia which is an integral part of the Zambian Public Service. The problem investigated is the difficulty that the Zambian Public Service had been encountering in implementing components of the PMS. [2], noted that the model of social programmes is founded on eight main elements also called dimensions that characterize all social interventions programmes. These eight main dimensions are as follows: Clearly identified goals and objectives; An intended target group or beneficiaries of the programme; Explicit measures of success (outcome measures); Programme components; A project management implementation system; A human resource base or programme drivers; Programme stakeholders; and Programme context or setting in which the programme is implemented. The researcher decided to apply the model of social programmes in this research for the following reasons: The model provides a holistic and comprehensive frame of reference for understanding and evaluating the implementation of any social intervention programme [2]. In this study, the social intervention programme is the implementation of the PMS in the Development Bank of Zambia. The model of social programmes is rich in literature and provides theoretical and practical explanations as to why the implementation of social interventions faces several challenges; Further, the model is a multi-dimensional analytical framework with eight dimensions that

affect the successful implementation of any social intervention. These dimensions help to deepen the understanding of the different aspects that might affect the implementation of any social intervention programme. The researcher evaluated other models that were available for use such as the performance management model proposed by [6] which was noted to include only three elements of performance management these are budgeting, performance evaluation and rewarding performance and the model by [7] used for measuring large scale organisational change and found these models to be limited as they covered fewer dimensions than the eight dimensions covered by the model of social programmes. The model by [7], uses six dimensions; [8], observed that compared to other models, the model for social programmes covers more dimensions of programme implementation making it more comprehensive and an appropriate tool for conducting analytical interrogations and providing data interpretations. The model for social programmes captures the multi-dimensional nature of the PMS. Despite other models having their application limitations as they focus on fewer dimensions, they can be used to complement and enrich the model of social programmes; The model of social programmes is an integrated analytical framework that can be used in combination with other models. The theoretical models that could be used to blend with the model of social programmes include theories of programmes implementation, institutional, motivational theories, and employee motivational theories [8]; The eight dimensions of the model were used as analytical categories and directed the study and ensured its coherence. The availability of these categories eliminated the need for the researcher to construct his own analytical categories [9]; The model of social programmes also provided some of the definitions and key concepts that have been used in the study [8]; and lastly, the model provided an explanation for the interpretation of study results. This formed a causal framework for the interpretation of study findings [2].

Background to the Public Service Reform Process in Zambia

The reforms in the public service started earlier than the 1990's. The performance management framework in the Zambian public sector is integrated in nature and has several components. Some of the components are vision, mission, and values; balanced scorecard; activity-based budgeting; performance management; performance-based reward system; business process re-engineering; and performance monitoring. The balanced scorecard is a critical component of the performance management system which is used as a strategic planning, performance measurement, management, and reporting tool. Therefore, the Zambia Public Service reform process by the Zambian Government has by and large revolved around the aspects mentioned above for some time now.

Results and Discussions

The data interpretation is discussed in terms of the eight dimensions of the model of social programmes. These dimensions have been identified as follows:

Dimension 1: Goals and Objectives

Good and effective goals and objectives are applied to the following acronym: SMART. This means that goals and objectives must be: Specific, Measurable, agreed upon, Realistic, and Time-bound. Respondents were asked to state whether goals and objectives of the Development Bank of Zambia were SMART. Overall, 29 (59.2%) respondents stated that the Banks goals and objectives were unclear and ambiguous, while 20 (40.8%) indicated that the Banks policy goals and objectives were clear and specific. Most of the respondents stated that the Development Bank of Zambia goals and objectives did not meet the SMART criteria. This is because of the difficulties encountered when attempting to define and measure

developmental impact of the loans, the difficulty to develop appropriate performance measures for the Banks work, and the difficulty to achieve the performance outputs or outcomes within an annual performance plan as the Bank gives out long tenure loans. It was noted that the timeframe of measuring success is not the conventional one. You must observe over a longer period which might go out of the performance measurement period [10]. This view was echoed by one respondent from middle management who supported this notion stating that the nature of the work of the Development Bank of Zambia is such that measurement is not always possible, at least within the time periods stipulated. This is because it is difficult to develop quantitative measures and targets for most of the objectives of the Bank. The objective to provide short, medium- and long-term finance to support the Government of the Republic of Zambia's economic development strategies for growth, wealth and job creation, infrastructure development, improved service delivery and overall poverty reduction is one such objective. Records available showed that the Development Bank of Zambia only started to systemically define and document goals and objectives in 2016. Before then, there was no record of goals and objectives, and general awareness, knowledge and clarity of goals and objectives was generally blurred depending on the different levels of training of the Bank staff [10]. Individual performance objectives should be aligned with departmental and institutional objectives. The alignment of objectives is one of the key tasks for performance management [11].

Linking Individual with Institutional Objectives

[12] are of the view that to enhance institutional performance and effectiveness, it is imperative that individual performance objectives be in alignment with departmental and the Banks corporate strategic objectives. 33 respondents representing (67.3%) of the respondents stated that their individual performance objectives were aligned and linked with their respective departments and the Bank's strategic objectives, while 16 (32.7%) indicated that their individual performance objectives were misaligned. Those who answered in the affirmative that there was alignment with their individual performance objectives and the respective departmental and the Banks strategic objectives justified their answer by stating that each year the Bank holds a strategic planning engagement to align individual performance objectives with departmental and corporate objectives. One respondent in middle management also noted that *there is a deliberate process undertaken each year to link and cascade downwards Banks and department objectives with individual performance objectives.* As regards the respondents who stated that their individual performance objectives were misaligned noted that their departmental heads developed their annual performance plans and strategic plans without referring to Banks corporate business and key performance indicators. According to the researcher's personal observation, the Bank approval of the Annual Budget for 2018 was delayed for almost six months making alignment of individual performance objectives which is supposed to be done early in the year possibly in February, impossible without a budget supporting individual activities. The Development Bank of Zambia being a Government of the Republic of Zambia development financing Bank mirrors activities in the National Development Plans, Sustainable Development Goals, and objectives of Vision 2030 to aid its planning process. Considering this, the researcher asked respondents to state whether the strategic goals and objectives of the Development Bank of Zambia were aligned to the Seventh National Development Plan, Sustainable Development Goals, and objectives of Vision 2030. In response, 49 respondents representing a (100%) response rate indicated that the goals and objectives of the Development Bank of Zambia were aligned to the National

Development Plan goals and objectives, Sustainable Development Goals and Vision 2030 goals and objectives. The respondents justified this on the basis that the Banks goals and objectives were derived from the Seventh National Development Plan, Sustainable Development Goals and Vision 2030.These are used as primary plans for guiding national development in Zambia. However, the alignment of individual performance objectives with departmental and Banks objectives has its own challenges. The challenges that were encountered include poor or weak strategic planning; shortage of strategy skills; limited stakeholder participation in strategy formulation and execution; lack of linkages to national development plans. In order to be successful in the implementation of any performance management system, it is imperative that institutional and individual objectives should have specific targets, milestones and outputs or outcomes against which performance will be measured.

Performance Measures

According to the [11], the setting of measurable performance targets, outputs and the identification of milestones assists employees to understand what they should be doing, how to do it and the performance results expected. Further, [13] observes that performance targets, milestones and outputs provide a basis for reviewing an objective (s). They also ensure that there are no surprises and confrontations during the performance review process [14]. Respondents were asked to indicate whether their individual performance objectives that are set and agreed upon with supervisors had quantified targets, milestones, and outputs. 36 respondents representing (73.5%) of the respondents indicated that their individual performance objectives had quantified targets, milestones, and outputs, while 13 (26.5%) stated that their individual performance objectives lacked quantified targets but had milestones and outputs. Although many respondents stated that their individual performance objectives had quantified targets, milestones, and outputs, as observed earlier, it is often difficult to develop appropriate performance measures for government or quasi government institutions, and a development financing institution such as the Development Bank of Zambia.

Vision, Mission, and Value Statements

Niven [15] observes that vision, mission, and value statements are a pre-requisite in the running of *any* institution because they guide decision-making, resource allocation, innovation and performance improvement, strategic planning, and management; serve as building blocks for strategic plans and annual performance plans; align efforts of every employee; and inspire employees and stakeholders. Respondents were asked to indicate whether the Development Bank of Zambia has a vision, mission and value statements, strategic plans, annual performance plans, and performance development contracts. 49 respondents representing (100%) responded in the affirmative that the Bank as a vision, mission, and value statement. They also indicated that the Bank has strategic plans, annual performance plans, and performance development contracts. They were however quick to mention that for the past two years, the Bank had not signed performance management and development contracts with employees as the strategic business plan which is the anchor of performance management was being re-aligned. Further, a question was asked to indicate whether these statements were simple, short, clear, inspiring, catchy, and memorable or lengthy, uninteresting, and difficult to memorise. 38 respondents representing (77.6%) indicated that the vision, mission, and value statements of the Development Bank of Zambia were simple, short, clear, inspiring, catchy and memorable, while 11 (22.4%) stated that the Banks vision, mission and value statements were lengthy, uninteresting, and difficult to memorise.

Available literature reviewed confirmed that the Bank has vision, mission and value statements.

Dimension 2: Target Group

Respondents were asked to state the target group of the performance management system in the Development Bank of Zambia. 43 respondents who represented (87.8%) stated that the performance management system targeted all categories of staff in the Bank. (12.2%) indicated that the performance management system was targeted at only those with Long Term Contracts. Long Term Contracts are three-year contracts while Permanent and Personable employees retire after attaining 65years. However, the (Development Bank of Zambia Performance Management and Development Contract Policy, 2019:2) confirmed that the performance management system of the Bank targets all categories of staff. The findings of the study also support the observation by [12] those new versions of the performance management systems cover all categories of staff unlike the old versions that targeted only managers or professional and technical staff.

Design and Implementation of the Performance Management System

(69.4%) respondents indicated that the target group was consulted during the implementation phase, while nine (18.4%) indicated that they do not know the answer, and six (12.2%) stated that the target group was not involved in the design phase of the system.

Most of the respondents who indicated that the target group was involved during the implementation phase stated that the Bank held Director's meetings, Executive Management Committee meetings, staff meetings, performance management and sensitisations intended to consult the target group. Heads of Departments were requested to develop new Job Descriptions for employees which were linked to the Corporate Key Performance Indicators to be included in the performance development contracts.

Performance Management System Discussions

Respondents representing (83.7%) indicated that they were provided with written and oral briefings to guide the implementation, while eight (16.3%) indicated that they were not provided with any written documentation and oral discussions.

A list of literature that was provided by respondents who indicated that they were provided with written documentation to guide the implementation of the performance management system in the Bank include the DBZ Strategic Business Plan, Performance Management and Development Contract Policy, Assessment Form, Performance Review Form and DBZ Human Resource Policy. According to [12] providing written documentation and oral briefings/discussions on the performance management system is considered a good management practice and is encouraged.

Quality of Performance Management Training

28 (57.1%) respondents rated the training they received as relevant, practical, and specific to the Bank's environment. 21 representing (42.9%) rated the training as irrelevant. Most of the respondents stated that performance management training was often accorded insufficient time as the topic is very broad. However, available literature showed that the performance management training in the Bank was more focused on senior management and less focused on middle management and general staff. This was so because the implementation of the performance management system in the Bank was leadership-driven [12]. 36 (73.5%) of the respondents indicated that they were not provided with refresher courses, while 13 (26.5%) agreed that they received refresher courses. Refresher courses are important because they refresh and reinforce the training previously provided on performance management system [12].

Performance Management Knowledge and Skills

33 (67.3%) of the respondents rated their performance management knowledge and skills as good or satisfactory, while 11 (22.4%) respondents rated their performance management knowledge and skills as poor or unsatisfactory, and five (10.2%) respondents rated their performance management knowledge and skills as excellent or outstanding. The findings should however be treated with caution because most people often overrate their abilities. Some respondents may have felt uncomfortable (psychologically) to divulge to an insider-researcher that their performance management knowledge and skills were poor. These are psychological effects.

Implementation Methodology

Respondents were requested to indicate which approach was used to implement the performance management system in the Bank. 36 (73.5%) respondents indicated that the Bank implemented the performance management system using cascading or top-down approach. 13 representing (26.5%) stated that the Bank used a mixed methodology of both top down and down up. Document analysis reviewed that the performance management system of the Bank was implemented using a top-down approach because it was modelled on the Zambia Public Service model of a bureaucracy, [10]. However, the top-down approach has inherent weaknesses of excluding middle management and general staff from the design of the performance management system, which create problems of lack of buy-in, ownership and acceptance from lower levels staff and rejection of performance objectives formulated upwards and later transposed downwards [12].

Acceptance by the Target Group

38 (77.6%) of the respondents indicated that the implementation was unenthusiastically embraced, while 11 (22.4%) respondents stated that the implementation was enthusiastically embraced. Several reasons were advanced by the respondents as reasons why there was reluctance to implement the performance management system in the Bank. One of the respondents in senior management noted that *some officers felt there was no benefit from implementing the programme when there is no clear reward system in the Bank*. Similar sentiments were expressed by a respondent in middle management who stated that *he had a premonition that the programme would not work for the Bank.* There were also other reasons that were identified by respondents which included resistance to change, fear to lose jobs, just desire to maintain the status quo, inadequate understanding and knowledge of the programme and its benefits, and widespread feeling that the programme was imposed and ill-suited for the Development Bank of Zambia. Literature reviewed indicated that the implementation of the performance management system in the public services was a challenge due to entrenched paradigms, mind-set and work ethics [17]. The researcher noted however that the study findings confirmed works by other researchers such as [18] and [5] that generally, there is reluctance to implement the performance management system.

Empowering or Management Tool for Punishment

37 respondents representing (75.5%) stated that they viewed the performance management system as an empowering management tool. However, (16.3%) indicated that they viewed the performance management system in a neutral way and four (8.2%) indicated that they viewed the performance management system as a punishment tool for management. The responses received from this question were unanticipated as it appeared to be laden with social desirability bias. Social desirability bias occurs when respondents provide the interviewer with responses that they believe are desirable to the interviewer. The researcher was conducting the research within his organization. This fact is

reinforced by [2], It also occurs when respondents avoid providing answers that are negative or embarrassing to themselves, their institution, family, or friends [3] adds. There is a high probability that many respondents many have felt psychologically unsafe to divulge to an inside-researcher that they view the performance management system as a tool punishment by management. In general, the performance management system is viewed as being inapplicable to the Bank due to its nature of business which is providing developmental loans that are long-term meaning the impact on development might not be seen in one performance period.

Dimension 3: Outcome Measures (Performance Measurement System)

38 (77.6%) indicated that the Bank uses the Balanced Scorecard as a performance measurement tool. 11 respondents (22.4%) indicated other performance measurement tools. The Bank uses the Balanced Scorecard as a performance measurement tool. The Balanced scorecard is widely used by public services in Commonwealth Africa [3]. Respondents were then requested to indicate whether the performance measurement system used by the Bank was simple and easy or complex to use. 26 (53.1%) respondents indicated that the performance measurement system used by the Bank was complex to use. 23 (46.9%) stated that the tool was simple and easy to use. As can be seen, most of the respondents stated that the Balanced scorecard was complex to use because of the need to create linkages with the four streams used in the tool. Further problems encountered by the Bank when implementing the Balanced scorecard were noted as the Balanced scorecard was not easily transferable to public institutions such as DBZ as it was originally designed for the private sector. The Bank has adopted operational procedures for the Public Service being a Public Service organization which sometimes can be bureaucratic in nature casing delays in decision making. From literature that was reviewed, it was noted that it has been a challenge for the Public Service organizations to develop performance measurement systems that are suitable to their specific contexts [19].

Dimension 4: Programme Components: Time Allocation

25 respondents representing (51%) indicated that the time allocated for the implementation of the performance management system in the Bank was not enough, while 24 respondents representing (49%) said the time allocated was adequate. The documents analyzed showed that the performance management system in the Bank had a five-year implementation plan. A five-year implementation period is considered adequate compared to the usual three-year periods [20]. However, due to the slow pace of implementation of the performance management system by the Bank, the Board of Directors in the Development Bank of Zambia set a deadline of 1st January 2020 to re-start the use of Performance Management and Development Contracts which had been paused awaiting approval of the re-aligned Strategic Business Plan for the Bank with its attendant Key Performance Indicators (KPIs). Consequently, the Bank had insufficient time to teach, assimilate and internalise the performance management system concepts [11].

Efforts

29 (59.2%) of the respondents indicated that the efforts devoted to the implementation of the performance management system were inadequate, while 20 (40.8%) said the efforts were adequate. This is in line with the assertion by [19] that Public Service institutions in Africa were pushed into implementing the performance management system, [and] one would conclude that the efforts were inadequate. It is also worth noting that management time, effort and attention were distracted by the absence of the Board of Directors in 2018 and part of 2019. The Board is critical in performance management in

that they need to approve the Budget and Key Performance Indicators for the Bank.

Human Capital

32 (65.3%) of the respondents stated that the human capital allocated for the implementation of the performance management system in the Bank was inadequate. 17 (34.7%) indicated that the human capital allocated was adequate. 74 employees are already in place against an establishment of 125.

Financial Resources

43 (87.8%) of the respondents indicated that the financial resources allocated for the implementation of the performance management system in the Bank were inadequate, while six (12.2%) stated that the financial resources were adequate. Literature revealed that the approved Budget had no specific Budget line for the implementation of the performance management system. Resources were being moved from other Budget lines to finance the activity. The implementation of the performance management system in the Development Bank of Zambia was affected by the world economic meltdown of 2019, climate change effects, electricity deficit in the country, implementation of austerity measures and high inflation which impacted negatively on the performance of the Bank resulting in its failure to allocate sufficient resources to the process. Consequently, funds to implement performance management system were inadequate due to competing priorities.

Effective Leadership

Out of the 49 respondents, 27 (55.1%) indicated that the Bank lacked effective leadership to implement the performance management system, while 22 (44.9%) stated that there was effective leadership. Most of the respondents who reported that there was ineffective leadership cited frequent changes to the Board and lack of a substantive Managing Director as the debilitating factor. The net effect of this, according to one respondent in middle management, was that "instead of moving forward the Bank was always moving backwards." Another respondent in senior management pointed out that "frequent change of leadership does not send positive signals to the operating environment of the Bank." Document analysis however revealed that indeed the Bank operated for a long time in 2018 without a Board and later the Bank operated with an Interim Board and Acting Managing Director. The Managing Director was in acting position for almost one year. [21] are of the view that high staff turnover of chief executive officers often slackens the pace of implementation of the performance management systems, and creates problems of inconsistency, discontinuity, and loss of institutional memory. Furthermore, it contributes to the weak implementation of policies and plans that had been put in place.

Dimension 5: Programme Infrastructure: Appointment and Promotion System

Rigorous appointment and promotion systems are used for career planning to identify high-fliers and rid non-performers. To this effect, respondents were requested to indicate whether the Development Bank of Zambia has in place an appointment and promotion system. 30 (61.2%) of the respondents agreed that the Bank had an appointment and promotion system, while 19 (38.8%) disagreed. However, literature revealed that the appointment and promotion system exists. The Bank has resourcing, succession, and promotion policies in place.

Induction of New Entrants

36 (73.5%) of the respondents agreed that the Bank provided induction, while 13 (26.5%) disagreed. Literature reviewed showed that due to lone recruitments, sometimes newly recruited officers were not inducted. Lone recruitment as opposed to block recruitments make it difficult for the Bank to devise a training programme for new entrants because it would result in multiple training programmes each time a new entrant is engaged. [22] observes that it also makes medium and long-term human resource planning

difficult. To curb these problems, [22] and [23] recommended that an organisation should consider recruiting annually in blocks.

Job Descriptions/Role Profiles

Job descriptions or role profiles are essential to the successful implementation of the performance management system. [12]. [24] observes that they ensure role clarity and optimum utilisation of labour by identifying roles and responsibilities for every employee. Job descriptions assist to measure, monitor, and evaluate staff performance [12]. 37 (75.5%) of the respondents agreed that the Bank had job descriptions or role profiles, while 12 (24.5%) disagreed. The Human Resources Departmental records established that it is standard procedure to have a job description for any new position created in the Bank. At the time of the study, the Bank was reviewing all job descriptions.

Instructions to Departmental Heads

Heads of Departments should be given detailed written instructions outlining the expected performance outcomes prior to the assumption of their work. Nine (81.8%) respondents in senior Management disagreed that the Bank issues Heads of Departments instructions, while two (18.2%) agreed. It was however established through literature review that instructions for Heads of Departments were recently introduced.

Performance Based Budgeting

[25] note that performance-based budgeting system is considered compatible with the performance management system because it links budgets with strategy, performance, and value creation. 41 (83.7%) of the respondents indicated that the Bank lacked a performance-based budgeting system, while eight (16.3%) agreed that the Bank has a performance-based budgeting system. The Bank uses line-item budgeting system. This is incompatible with the performance management system and is identified as one of the main causes of implementation failures of performance management systems [26].

Performance Management & Development Contracts

Performance contracts are management tools that enable employees focus on key issues and priorities (strategic management), good governance and accountability, human resource management, systems management, and financial management [27]. Nine respondents representing (81.8%) of the respondents stated that the Bank has in place a performance management and development contracts, while two (18.2%) indicated that the performance management and development contracts were non-existent. However, literature reviewed showed that the Bank has performance management and development contracts based on the format used by the Ministries of Foreign Affairs of Australia, Canada, New Zealand, and Switzerland. Australia and New Zealand have better performance management and development contract systems which promote greater and close dialogue and co-ordination between subordinates and superiors [19].

Hand Over Notes

28 respondents (57.1%) agreed that the Bank has in place and uses hand over notes, while 21 (42.9%) disagreed. They added that although the Bank uses hand over notes, they were not mandatory. Handing over notes are critical to the successful implementation of the performance management system because they provide successors with the basic knowledge and information required to perform the job effectively and efficiently so that the transition period runs smoothly and as short as possible [28]. Handover notes should also be prepared when a staff member is temporarily absent for a month or when the staff member leaves his or her position due to transfer, promotion, retirement, and resignation. In case of a temporary absence of one month or more, a staff member who was holding the office should also

prepare hand over notes to ensure a smooth transition back to the substantive holder of the post [28].

Performance Appraisal

42 respondents representing (85.7%) agreed that the Bank had a performance appraisal system in place, while 7 (14.3%) disagreed. Literature analyzed however in the Human Resource Department revealed that the appraisal system that was in place was not customised to suit the specific requirements of the Bank and that the appraisal system was being revised to be in tandem with the requirements of the Bank. [22] however observes that subjectivity cannot be eliminated from performance evaluation because there is a portion for assessment of personal attributes in the performance and development plans [30]. Records further revealed that officers were irregularly reviewed. As a result, staff appointments and promotions were sometimes delayed because of lack of performance reviews and supporting recommendations. [31] states that no one reads the performance appraisal forms once they are completed and submitted. Performance feedback is rarely provided This is so because African and Asian cultures are relationship oriented, hence the reluctance by raters to provide negative feedback to avoid offending the ratees [29].

Performance Reporting

39 respondents representing (79.6%) agreed that the Bank has performance reporting systems, while ten (20.4%) disagreed. The Bank uses the balanced scorecard and the issues, implications, actions, and accountability format as performance reporting systems. This however is still at infancy stage [10]. The literature also showed that the Bank reported twice a year on its implementation of the strategic business plan to the Nominations and Remunerations Committee of the Board. [32] state that the public sector often lacks skills and capacity for performance reporting.

Monitoring and Evaluation (M&E)

27 respondents representing (55.1%) agreed that the Bank has a monitoring and evaluation system, while 22 (44.9%) disagreed. Most of the respondents who indicated that the Bank lacked a monitoring and evaluation system stated that performance logs were not maintained, checkpoint meetings were not held, performance reviews were irregularly conducted and that there was no provision of performance feedback as provided by the 360 Degrees principle. It was further noted that the Bank lacks a dedicated monitoring and evaluation unit/department and a monitoring and evaluation policy. The Bank also lacks a dedicated planning unit leaving every department to plan individually. [27] notes that the institutionalisation of performance monitoring and evaluation in the public service is constrained by bureaucratic management culture.

Acknowledgements and Rewards

34 respondents representing (69.4%) agreed that the Bank has an acknowledgement and reward system, while 15 (30.6%) of the respondents disagreed. However, according to a cross section of staff interviewed in the Bank, the morale of staff is low because of complaints of work overload in some departments, inadequate promotion avenues in some departments, and lack of transparency in acting and rewards management.

Information and Communication

32 (65.3%) of the respondents indicated that the Bank has an information and communication system, while 17 (34.7%) disagreed. Documents analysed showed that the Bank headquartered in Lusaka was linked to the Ndola office through a secure virtual private network for electronic mail and internet connectivity [10]. Further, the documents revealed that the Bank has a communication strategy which is used to communicate key messages with the local and international stakeholders.

Equity and Grievance Processing Mechanisms

39 respondents representing (79.6%) of the respondents indicated that the Bank lacked equity and grievance processing mechanisms, while ten (20.4%) agreed that the Bank has an equity and grievance processing mechanism. However, literature showed that the Bank lacked a robust equity and grievance processing mechanism. There are also perceived inconsistencies and unfairness in some promotions and further training opportunities.

Mandate Document

38 respondents representing (77.6%) of the respondents indicated that the Bank lacked a written mandate document, while 11 (22.4%) said that the Bank has a written mandate document. The documents however revealed that the Bank has a mandate as contained in the Development Bank of Zambia (DBZ) Act Cap 363 of the Laws of Zambia but that there is no separate document.

Business and Trade Policies Availability

27 (55.1%) of the respondents stated that well-crafted business and trade policies were available, while 22 (44.9%) disagreed. Literature reviewed however showed that the Bank had well-crafted business and trade policies guiding various activities such as loan types and recipients, criteria for accessing loans, loan restructuring, interest rates and foreclosure.

Dimension 6: The Human Resource Base: Human Capital and Banks Capacity

39 (79.6%) of the respondents indicated that the officers were competent to perform their roles, while seven (14.3%) of the respondents stated that they were not well-trained and skilled to perform their roles, and three (6.1%) stated that they doubted if the officers were well-trained and skilled to do the work. The study revealed that the institutional structures that were established to facilitate the effective implementation of the performance management system in the Bank were weak. 31 (88.6%) indicated that these structures sometimes worked, while four (11.4%) of the respondents indicated that these structures were very effective.

Performance Management Champions

10 representing (90.9%) of the senior members of staff indicated that the Board was supportive of the initiative by Management. The performance management literature also shows that the highest political and administrative leadership of the Zambia public service in general has also demonstrated visionary leadership, commitment, and support to the implementation of the performance management system including the President of the Republic who has directed that all Permanent Secretaries be under performance management contracts [34]. Zambia is classified as an advanced reformer because it is one of the early adopters of the performance management system in Africa.

Dimension 7: Programme Stakeholders

[12] are of the view that the involvement of stakeholders is important. Respondents were asked to list the stakeholders and channels of engagement. The Ministry of Finance and Bank of Zambia officials were consulted through the sharing of the DBZ Strategic Business Plan while meetings and letters were used for others.

Dimension 8: Programme Context

Respondents under Dimension 8 were requested to indicate whether the institutional and external environments supported the implementation of the performance management system in the Bank. This could have been achieved using environmental scanning tools.

Environmental Scan

49 respondents representing (100%) of the respondents indicated that the Bank used SWOT analysis for environmental scanning. 38 respondents representing (77.6%) indicated that the SWOT analysis was simple and practical,

while 11 (22.4%) indicated that it was sophisticated. This assertion agrees with findings by previous studies such as those by [35] which states that the complexity of SWOT analysis is often underestimated in many institutions.

Institutional Environment

Institutional structure; Performance-oriented culture; Decentralised management authority; Learning and measurement culture; Democratic management style; Risk-taking culture; Proper office space and accommodation; and Work systems and processes are critical to the implementation of performance management.

Institutional Structure (Framework)

Institutional structure is a prerequisite and critical tool for efficient and effective management of any institution. This must be adequate. An adequate institutional structure has the right staff mix appointed to the right positions at the right time and in enough numbers to effectively execute the institutional mandate [12], [36], [37]. 30 (61.2%) of the respondents indicated that the institutional framework for the Bank was adequate, while 19 (38.8%) indicated it was inadequate. Organisational reviews and restructuring reports revealed that the current institutional structure of the Bank was more than adequate. The strategic business focus for the Bank has however changed from directly engaging with Small and Medium Enterprises to wholesale lending using intermediaries. This does not require a lot of staff as intermediaries will be used to reach clients [10].

Performance-Oriented Culture

26 respondents representing (53.1%) of the respondents indicated that the Bank did not have a performance-oriented culture, while 23 (46.9%) indicated that the Bank has a performance-oriented culture. Most of the respondents stated that the culture of performance management was new in the Bank and was yet to be entrenched. A review of literature showed that African and Asian cultures lack a performance-oriented culture. Studies by [24] show that it is often difficult for public service institutions to shift from the historic public service culture and the bureaucratic model of public administration to a performance-oriented culture.

Decentralised Authority

29 (59.2%) of respondents indicated that the Bank has centralised management authority, while 20 (40.8%) indicated that the Bank has decentralised management authority. Available literature however shows that the Bank, has centralised management authority. This is so because most of the legislation such as the Public Procurement Act, No.12 of 2008, the Public Finance Management Act, No.1 of 2018 and the Development Bank of Zambia (DBZ) Act Cap 363 of the Laws of Zambia have all concentrated authority in the Managing Director. Major decisions cannot be made at the Banks' branch in Ndola as these have to be referred to headquarters where the Managing Director and Directors are based.

Learning and Measurement Culture

34 (69.4%) of the respondents indicated that the Bank has a learning and measurement culture, while 15 (30.6%) indicated that the Bank does not have a learning and measurement culture. Banks often learn from their counterparts through benchmarking, request for technical assistance, study tours, research and knowledge exchanges, seminars, and conferences. Learning from others is crucial to the successful implementation of the performance management system because it may assist to speed up the implementation process by drawing on international best practices and to avoid reinventing the wheel [32].

Democratic Management Style

[39] observes that a participatory and an all-inclusive style of management is suitable for the successful implementation of the performance

management system than an authoritarian style as it encourages employee involvement in decision-making thereby enhancing initiative and creativity. It stimulates employee commitment, loyalty, motivation, and job satisfaction [39]. The researcher therefore asked respondents to indicate whether the Development Bank of Zambia has a democratic management style. 31 (63.3%) of the respondents indicated that the Bank has a democratic management style, while 18 (36.7%) stated that the Bank did not have a democratic management style. Most of the respondents stated that the Bank operations promoted a democratic management style through the formation of committees that involve staff members in decision-making processes. The Bank has established Project Management Committee; Procurement Committee; Integrity Committee and Executive Management Committee at the headquarters to promote participative leadership and to ensure that decision-making processes are transparent and key decisions are not made by a single individual employee to curb corruption and abuse of office. Literature reviewed on the other hand showed that generally, management styles in Africa are perceived to be authoritarian and paternalistic emphasising absolute obedience to authorities and elders [37].

Risk-taking Culture (Risk Appetite)

36 (73.5%) of the respondents indicated that the Bank lacked a risk-taking culture, while 13 (26.5%) stated that the Bank has a risk-taking culture. Literature reviewed showed that the Bank has a risk-averse culture rather than a risk-tolerant culture because of the sensitivity of its business and that is of lending out large amounts of finances for development. Partly because of the risk-averse culture, there is lack of delegation. Most of the sensitive responsibilities relating to the approval of loans are performed by high-ranking officer who are most senior and more experienced.

Office Space

22 (44.9%) of the respondents indicated that the Bank has inadequate office space, while 27 (55.1%) stated that office space was adequate. Literature shows that the Bank owns two buildings. The buildings still have vacant offices.

Work Systems and Processes

29 (59.2%) of the respondents indicated that the Bank has good work systems and processes, while 20 (40.8%) indicated that the work systems and processes were inadequate. The study found that the Bank was further automating some of the loan processes by installation of a Credit Scoring and Pricing Model. Recently, the Bank also deployed an Enterprise Resource Planning system which is integrated to enable quick processing of information.

External Environment

The external environment has an impact on the implementation of the performance management system as follows: Political and Administrative Structures: 37 (75.5%) of the respondents indicated that the political and administrative systems were favourable to the implementation of the performance management system. The Bank operates in a democratic political and administrative system, which is compatible with the implementation of the performance management system. Zambia is a developmental state with effective public administration institutions, including a professional public service with an established tradition of implementing sound development policies and public service reforms that are nationally driven and financed [34], although the political and administrative systems are favourable, the Bank operates in a global environment characterised by competition, risk, volatility, uncertainty, complexity, and ambiguity [39]. These pose a challenge to the successful implementation of performance management as their impact on the global

economy affects all institutions including the Bank.

Information and Communication Technology (ICT)

28 (57.1%) of the respondents indicated that the information and communications technology infrastructure used by the Bank was unfavourable to the implementation of the performance management system, while 21 (42.9%) stated that the information and communications technology infrastructure was favourable. Most of the respondents who stated that the information and communications technology infrastructure was inadequate cited old information and technology infrastructure and lack of specific software that can be used to monitor performance.

Conclusion

Therefore, based on the above results the main conclusion of this study is that the implementation of the components of performance evaluation system in the Development Bank of Zambia has some challenges. There are many challenges and constraints that the Bank must overcome to put the implementation of the performance management system on the right track.

However, despite these challenges such as limited resources, competing priorities, national development challenges and the gloomy outlook of the international environment, the Development Bank of Zambia put in a lot of effort to ensure that the implementation of the performance management system in the Bank was a success story.

Ethical Consideration

Approval to conduct this study at the Bank was granted by the Managing Director. Written informed consents/assent were obtained from the study participants after explaining the study aim, procedure, and voluntariness of participation.

Conflict of Interest

The Author did not have conflict of interest.

Study Limitations

[3] observes that any given study will have limitations related to the research methods and strategies used. The respondents for this study were chosen using purposive sampling to ensure that all the three levels of employees, namely senior and middle management and general staff were represented. The response rates for senior management and middle management were lower at 15 compared to 34 for general staff. The low response rates from middle management and senior management affected the representativeness of the sample and limited the amount of survey data collected from these two groups. Despite this limitation, the response rates were above the 15 to 20% which is common in a mail survey, even after two or three reminders are sent. This study like any other studies that use the case study, evaluation research and survey methods, was also susceptible to bias such as social desirability bias; non-response bias; sampling bias; recall bias (memory decay); interview saturation; and omniscience syndrome and acquiescence response set.

Areas for Further Research

The study suggests the following as possible areas for future research: 1**,** Effects of the performance management system on the quality-of-service delivery in the Development Bank of Zambia; Benefits of implementing the performance management system in the Development Bank of Zambia; A comparative study of the implementation of the performance management system in the Development Bank of Zambia and China Development Bank; The impact of performance management in the Development Bank of Zambia.

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The Correlation between Sleeping Patterns and Academic Performance for TAU Medical Students

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Abstract

Sleep is very essential to promote proper functioning as human beings. Yet, in the "medical society", whether as a student or practitioner, it's a known fact that a lot of individuals struggle with different types of sleep disorders of varying degrees. Recent studies have been able to shed light on the detrimental effects of inadequate sleep on the general health and productivity of a person. The Circadian rhythm dictates the body's natural bedtime-wakeup schedule. The better the quality of sleep, the less likely we are to experience significant daytime sleepiness. When a student has to do 8 courses, go to school for 10 hours and do extracurricular activities like volunteering, the time it will take to cover all of those tasks, sleep seems almost impossible for medical students. Regardless of whether previous students, now practitioners, were able to complete these tasks does not indicate that there is no problem. It is important we research this correlation because we need to know if this aspect in our day-to-day lives affects our outcome in academics. As students, we are expected to do a lot in a short span of time and pass exams with flying colours. As such, we must investigate one of the proposed factors that leads to poor academic performance in students. For the purpose of this research, our sample community would be limited to Texila American University Students in MD1-MD4.

Keywords: *Academic, Medicine, Performance, Pittsburgh, Students, Sleep.*

Introduction

Sleep is one of those activities that we take for granted, and its importance for daily functioning is easily undermined. It is a beneficial activity that we easily trade without a doubt, sometimes for a night out or to try and meet an impending deadline. However, some have not realized that without this 'basic foundation for all activities, we would not be able to do any of the things we consider more important efficiently. Sleep is an important part of daily human routine, and it is as essential to survival as food and water. It is an important aspect of life that must take place in order to prepare for the activities to come [1]. A lack of adequate sleep can also be denoted as Sleep Deprivation. In an article written by E.Suni and reviewed by Dr. A. Dimitriu, the term sleep deprivation refers to achieving less amount of sleep that a person requires, which differs in age and daily activities. For adults', the average amount of sleep ranges from seven to nine hours. Some noticeable short-term impacts of sleep deprivation are lack of energy, poor or risky decision making, worsened memory, reduced attention span, and slow thinking. The long-term impact compromises our physical and mental health [2].

Yet, in the "medical society", whether as a student or as a practitioner, it's a known fact that a lot of individuals struggle with different types of sleep disorders of varying degrees. Recent studies have been able to throw more light on the detrimental effects of inadequate sleep on the general health and productivity of a person. In the literature on medical students, sleep experience poor sleep due to the demand for high

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academic performance, stress, and anxiety related to medical school. The better the quality of sleep, the less likely we are to experience significant daytime sleepiness, which would decrease daytime productiveness. When a student must do 8 courses, go to school for 10 hours and do extracurricular activities such as volunteer, the time it will take to cover all of the work given in class, study, and sleep seems almost impossible for medical students. Regardless of whether previous students, now practitioners, were able to complete these tasks does not indicate that there is no problem. Most likely, their performances in school would have been so much better if they had considered the importance of sleep as much as they should have.

It is important we research this correlation and necessary that we investigate one of the proposed factors that leads to poor academic performance in students. For the purpose of this research, our sample community would be limited to Texila American University Students in MD1-MD4.

The aim of our research was to assess the effects of the sleeping patterns among TAU medical students and to see if there is a correlation between sleep patterns and academic performance. Our objectives also are as follows:

1. To describe the sleeping patterns of students ranging from MD1 to MD4 at TAU.
2. To identify the possible factors associated to sleep disorders among the students.
3. To assess the association between the student's PSQI scores and the student's academic performance.

Methodology

This research aims to assess the effects of sleeping patterns on academic performance.

Study Design

A cross-sectional study was used to assess the students of Texila American University on their sleep habits and the effects these habits had on their daily performance, and resultantly an idea of the importance of sleep was put forward.

Questionnaires in the form of online forms were used to extend the reach of the data collection. The computed questionnaires were made easier to compile and analyse the data as the Google Forms software did some preliminary graphing. This method was quick to fill out and produced large amounts of data to be analysed. The drawbacks of this included the fact that it could not be verified that the information submitted by the students is factual, and they could manipulate the research. Also, questions may have been interpreted differently by different students.

The questionnaire utilized both open-ended and closed-ended questions so that both qualitative data and quantitative data were collected. Questionnaires are economical and provide uniformity of responses.

A questionnaire in the format of a Google Form was distributed by a link to students in semester MD1 to MD4, which constitutes a large section of the entire population. The data collection was gathered from the responses of students who decided to participate. Their responses were compiled and subsequently analyzed.

Sample Approach

Population: The target population of this research was students of Texila American University.

Sampling frame: MD1, MD2, MD3, and MD4 students.

Sampling technique: We used all the information gathered because we had a limited number of responses.

Sampling Size: We had 24 responses. Due to the limited amount of responses, we used all 24 responses.

Recruitment Method/ Inclusion Criteria

Permission for the carrying out of this study was obtained from the research committee of the University. The inclusion criteria for this

research target students enrolled in semesters MD1, MD2, MD3, and MD4. The target population will be informed via emails or messages distributed in their classes' WhatsApp or Skype groups. Students will be asked to indicate their interest in participation over a two (2) day period, thus ensuring that their participation was by choice.

Exclusion Criteria

This research will exclude individuals who are not fully registered students of Texila American University, College of Medicine.

Data Collection

As discussed in the Study Design, the questionnaire link was distributed to each class from MD1 to MD4, and twenty-four (24) responses were collected in total.

Results

All students that participated in the research completed the consent before moving on to complete the questionnaire as well as the PSQI test.

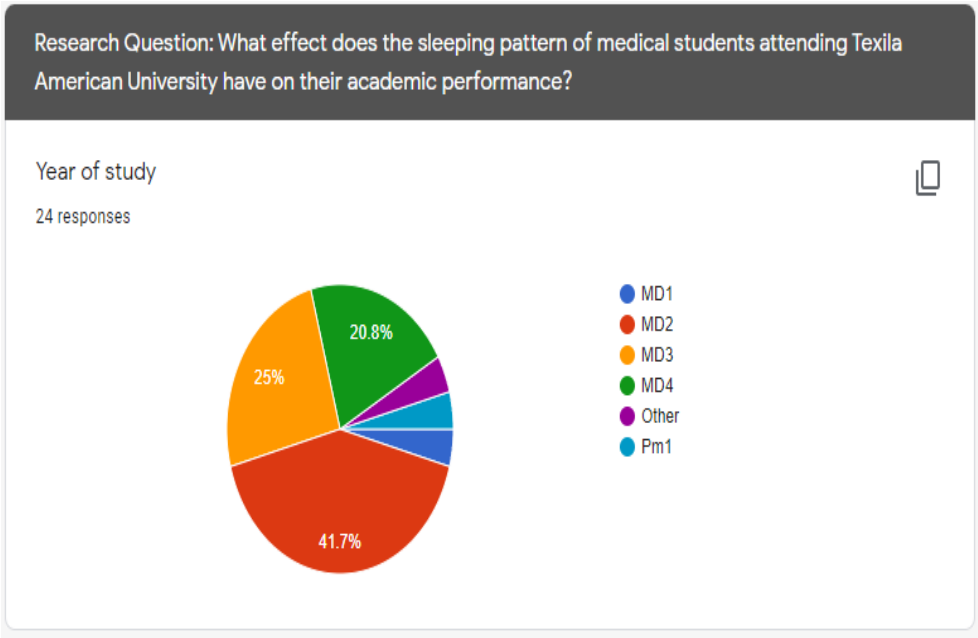

Figure 1. Questionnaire

We needed to establish if any of the participants had any chronic illnesses such as heart failure, arthritis or Parkinson's disease, or diabetes mellitus 2. 87.5% of participants indicated that they had no chronic illnesses, 8.3% of participants indicated that they do have chronic illnesses and 4.2% indicated diabetes mellitus. Participants were also asked if they were on any medications such as antihistamines or antidepressants that affect the sleep cycle. 8.3% of persons indicated yes, and 91.7% indicated no. Participants were asked if they experienced stress. 87.5% of persons indicated yes, and the remaining 12.5% indicated no. Participants were asked if they experienced depression. 37.5% of persons indicated yes, and the remaining 62.5% indicated no. Participants were asked if they experienced anxiety. 4.2% of persons indicated yes, and 95.8% indicated no.

Participants were asked to approximate how long they spent studying at night.

8.3% of participants spent less than an hour, and 8.2% of individuals spent five hours studying. They were then asked to rank what range their average grades fall into. 8.3% of participants indicated that their average grades fell within the range of 90-100%. 83.3% of participants indicated that their average grades fell within the range of 70-89%. 8.3% of participants indicated that their average grades

fell within the range of 50-69%. None of the participants indicated that their average grades fell within the range of below 50%.

Participants were asked to rate their sleeping environment on a scale of 1-10. There were 24 responses, and of that number, 1 person rated their sleep environment at a number of 1 (4.2%), no one rated their sleep environment at 2 (0%), 1 person rated their sleep environment at a number of 3 (4.2%), and 1 participant rated their sleep environment at a number of 4 (4.2%). 2 Participants rated their sleep environment at 5 (8.3%), 1 person rated it a 6 (4.2%), 4 persons rated their sleep environment at a number of 7 (16.7%), 4 persons also rated their sleep environment at a number of 8 (16.7%). With the highest number, 7 persons rated their sleep environment at 9 (29.2%) on the scale, and 3 persons rated their sleep environment at 10 (12.5%). We also needed to know if the participants were able to sleep through the night once they fell asleep, and 70.8% of persons indicated yes, and 29.2% indicated no.

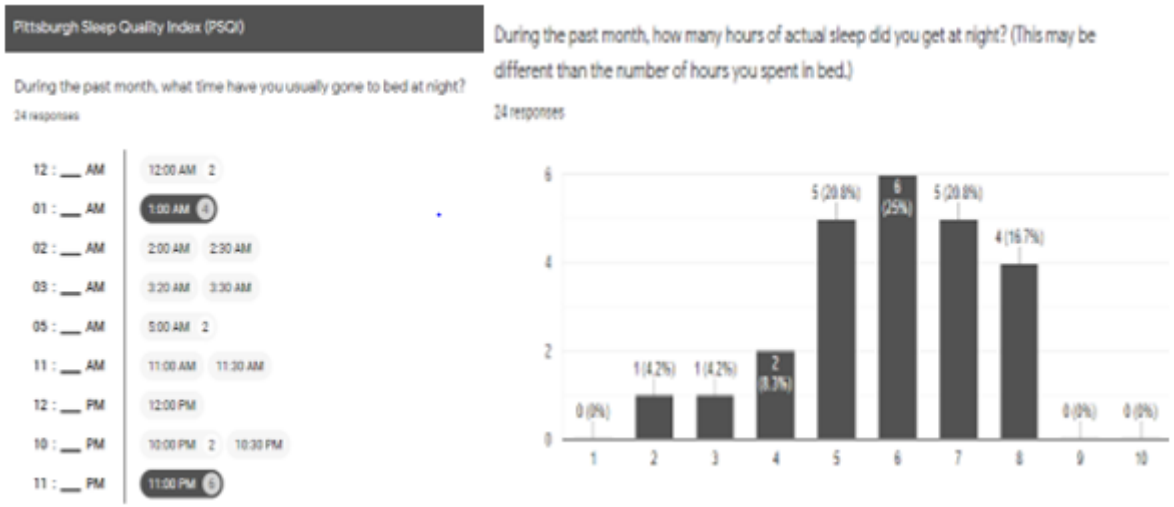

Figure 2. Pittsburg Sleep Quality Index

An important question answered by participants in this section of the questionnaire was what their usual wake-up time was in the past month. Most people woke up before 6:30 AM, with majority being at 8:00 AM and only a few people woke up by 12:00 PM. Other questions were asked, like how long in minutes it took for participants to fall asleep within the last month. 10 minutes had the highest number of responses however, 2 persons selected 10-15 minutes; 2 persons also selected 30 minutes. We then asked how often participants had trouble sleeping in the past month because they could not fall asleep within 30 minutes. The majority, 33.3% of participants, did not have trouble falling asleep within 30 minutes in the past month. However, other participants had trouble falling asleep within 30 minutes at least once or more times a week.

The next question asked how often participants had trouble sleeping in the past month because:

1. They woke up in the middle of the night or early morning. Few participants had trouble sleeping because they woke up in the middle of the night or early morning more or less than three times a week. Around 54.2% of participants did not have trouble sleeping because they woke up in the middle of the night or early morning during the past month.
2. They had to get up to use the restroom. 12.5% of participants had trouble sleeping in the past month because they had to get up to use the restroom less or more than three times a week, respectively. 29.2% of participants had trouble sleeping in the past month because they had to get up and use the

restroom once or twice a week. The majority, 45.8% of participants, did not have trouble sleeping in the past month because they had to get up and use the restroom.

3. They could not breathe comfortably. 4.2% of participants had trouble sleeping in the past month because they could not breathe comfortably three or more times a week. 8.3% of participants had trouble sleeping in the past month because they could not breathe comfortably less than once a week. 12.5% of participants had trouble sleeping in the past month because they could not reach comfortably once or twice a week. 75% of participants did not have trouble falling asleep in the past month because they could not breathe comfortably.
4. They cough or snore loudly. The majority, 87.5% of participants, did not have trouble sleeping in the past month because they snore or cough loudly. The remaining 12.5% of participants had trouble sleeping in the past month because they cough or snore loudly less than once a week and once or twice a week.
5. They felt too cold. 4.2% of participants had trouble sleeping in the past month because they felt too cold three or more times a week. 20.8% of participants had trouble sleeping in the past month because they felt too cold less than once a week. 20.8% of participants also said they felt too cold once or twice a week. With the majority, 54.2% of participants did not have trouble sleeping in the past month because they felt too cold.
6. They feel too hot. Out of 24 responses, 50% being the highest number did not have trouble sleeping due to feeling hot. 25% had trouble sleeping because they've felt hot less than once a week. 16.7% reported they have trouble sleeping once or twice a week due to feeling hot, and only 8.3% reported having trouble sleeping three or more times a week.
7. They have had bad dreams. 24 responses were submitted, with 14.15% being the lowest number stating that they had double sleeping due to bad dreams once or twice a week and another 14.15% threw or more times a week. 25% say they've experienced trouble sleeping less than once a week during the past month and 66.7% being, the highest number, reported they've had no trouble sleeping due to bad dreams.
8. They have pain. 24 responses were submitted, with 58.3% being the highest had no issue sleeping because of pain. 20.8% experienced issues sleeping due to pain less than once a week. 16.7% experienced pain once or twice a week, and the remaining 4.2% experienced pain three or more times a week.
9. They have other reasons. Most participants, that being 79.2%, reported no issue sleeping due to other reasons.

We asked participants to recall the past month to answer how often they have taken medicine to help them sleep (prescribed/ OTC)? 24 responses were submitted 91.7% being the highest number have not taken any medications to assist with sleeping. 4.15% reported taking medications to aid in sleeping once or twice a week, while another 4.15% reported taking medications three or more times a week. Another question asked how often they had trouble staying awake while driving, eating meals, or engaging in the social activity? 24 responses were submitted, 66.7% being, the majority of participants stated they've had no trouble staying awake during the past month. 20.8% say less than once a week, they've had trouble staying awake. 8.3% reported once or twice a week, while 4.2% reported they've had trouble staying awake three or more times a week. We asked how much of a problem has it been for you to keep up enough enthusiasm to get things done? 24 responses were submitted 29.2% being the highest number of participants had only a very slight problem keeping up enthusiasm. 25% reported having no problem keeping enthusiasm, while another 25% had somewhat of a problem. The remaining 20.8% say they've had a very big problem keeping enthusiasm. The next question

asked participants to state how they would rate your overall sleep quality. 58.3% being the highest number, rated their overall sleep quality as good. 16.7% rated their overall sleep quality bad. 12.5% being the lowest number rated very good, and other 12.5% rated very bad.

This next series of questions were directed to those with a bed partner or roommate. Of the 24 participants, 58.3% being the highest number, reported having no bed partner or roommate. 25% reported having a partner in the same room but not the same bed. 12.5% reported having a partner/roommate in another room, while 4.2% reported having a partner in the same bed. The questions asked: If you have a roommate or bed partner, ask him/her.

1. How often in the past month have you had loud snoring? 8.3% being, the lowest number of participants stated they've snored loudly once or twice a week during the past month.91.7% being the highest, reported no loud snoring during the past month.
2. How often in the past month have you had long pauses between breaths while asleep? 24 responses were submitted, and 100% of participants reported no long pauses between breaths while asleep.
3. How often in the past month have you had leg twitching/ jerking while you sleep? 83.3% being the highest number, reported no leg twitching/ jerking while sleeping. 8.3% says less than once a week, they experience leg twitching/jerking while sleeping. 4.2% being the lowest number, says once or twice a week they experience leg twitching/ jerking while sleeping and another 4.2% reported leg twitching/jerking three or more times a week.
4. How often in the past month have you had episodes of disorientation or confusion during sleep? 91.7% being, the highest number, reported no disorientation or confusion during sleep. 4.15% says less than once a week they experience disorientation/ confusion, and another 4.15% reported they experience disorientation/confusion once or twice a week.
5. How often in the past month have you had other restlessness while you sleep? 70.8% being, the highest number of participants reported no other restlessness during sleep in the past month. 8.3% stated once or twice a week, and another 8.3% says three or more times a week. 4.2% being the lowest number, reported they experience tossing and turning, another 4.2% reported change in sleeping position during the night, and another 4.2% says they don't know.

Ethical Consideration

Ethical consideration will be exercised during this research, the purpose of the research and how the findings will be used and documented will be presented to participants, and a full consent section will be included on the questionnaire for participants to fill in before data collection begins. The participant's information will remain confidential and anonymous, and respect for the dignity of research participants will be prioritised. No harm will be done to any respondents, both physical and psychological (stress, pain, or anxiety).

Discussion

This research aimed to assess the effects of the sleeping patterns among TAU medical students and to see if there is a correlation between sleeping patterns and academic performance, with the following objectives:

1. To describe the sleeping patterns of students ranging from MD1 to MD4 at TAU.
2. To identify the possible factors associated to sleep disorders among the students.
3. To assess the association between the student's PSQI scores and the student's academic performance.

According to this research findings, a high percentage of students go to bed unassisted (no tea, alcohol, hard drug, or medication), a good percentage of students. (58%) get good, quality

sleep, and over 80 % get an academic average of over 70%.

The above findings support the research article by [2].

But, seeing that up to 58% of research subject says they get quality sleep, and only about 37% gets up 7 – 9 hours, the required hours of sleep, according to the article written by E.Suni and reviewed by Dr A. Dimitriu, many factors may have influenced this outcome. We should also take cognizance of the fact that the research of the previously cited publications was carried out prior to online learning, while this research was done during the core of online learning. This can also be a large influencer of this research outcome.

Also, the expected number of participants was not achieved, and we had a smaller subject pool, thus leaving a large error margin. Secondly, the intended virtual interview was not carried out.

For the future purpose, the following suggestions may be considered:

1. The correlation between gender and sleep deprivation.
2. Sleep deprivation and stress, what percentage of stress is academic related?

Conclusion

Although our research centers around individuals sleeping patterns and its effects on their academic performance, we cannot dismiss the fact that some of our participants would have other factors, such as family issues and finances, to name a few, which would affect their performances in school. This is one of the major drawbacks of our research, but regardless it is still an area that needs to be looked into as regards Texila students. The results of our research can help in educating the students on better ways to maximise and manage their time properly and not forego sleep. This would help to produce maximal results in their exams.

Acknowledgement

We would like to acknowledge all who contributed to the success of this paper. Firstly, the Dean of Medical College of Texila American University, Dr. Dheeraj Bansal, and our lecturers Dr Josh Kanhai, and Dr Olivia Perez; for teaching us and making resources available to us. We also appreciate the research committee for approving our research work and the entire staff of the College.

We also appreciate the medical students of Texila American University, MD 1 - 4, September - March 2022 batch for their participation.

Our ultimate gratitude goes to God Almighty and our families for their immense support and provision.

Conflict of Interest

Though every participant took part of their own free will, we were not able to ascertain if all the answers offered by the participants were honest.

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A Comparison of Students' Attitude and Perception towards Morning or Afternoon Classes in Texila American University, 2021

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Abstract

This paper reports on the findings from focus groups conducted at Texila American University on the attitudes of its medical students towards morning lectures. Students felt that two things were vital for a good lecture: (1) that the lecturer goes beyond what is written in the lecture notes; (2) that the lecture is interactive, by which students meant that the lecturer asks if students understand concepts and adjust the delivery accordingly, and the lecturer answers the students' questions. The students in the focus groups also discussed what makes for a bad lecture: (1) lecturers reading straight from slides; (2) lecturers who 'blame the students' by saying that students don't work hard enough and are too lazy to turn up to lectures; and (3) lecturers who cover the material too slowly or too quickly. The most prominent reason given for not attending lectures was the timetabling of lectures in such a way that students had too few classes in one day to make the sojourn to university worthwhile and relating to feelings of tiredness each afternoon. Any university seeking to improve attendance at lectures should perhaps look as much to improving its timetabling practices as it does to improve the practices of its individual lecturers.

Keywords: *Focus groups, Lectures, Student attitudes.*

Introduction

Very simply, a lecture is an organized verbal presentation of subject matter often augmented by visual aids. According to Bligh [1], a lecture is a period of more or less uninterrupted talk from a teacher. A more detailed definition is found in Percival and Ellington, who state that a lecture is 'a didactic instructional method, involving one-way communication from the active presenter to the more or less passive audience'. Perhaps unkindly, we should also include the student who described a lecture as 'an occasion to sleep whilst someone talks. Students of Texila American university were chosen to be the study population as the researchers are also students of the institution and would like to use the information found to benefit their fellow schoolmates. This research was done to assess whether the timing of lectures affects the quality of attitude learning in students in MD 1 to MD 3 at Texila American University. A study conducted by psychologists Serge Onyper and Pamela Thacher at St. Lawrence found some statistical data proving a correlation between class time and performance. According to the National Institute of General Medical Sciences [2], circadian rhythms are physical, mental, and behavioural changes that follow a 24-hour cycle. Researchers at Stanford University have shown that when the circadian system breaks down, so does memory. This means that sleep influences memory retention. If classes are started later in the morning, students will have more time to rest and are refreshed for classes after. When classes are started later in the morning, it improves grades in courses as students will be in a better emotional state and ready to learn, favouring memory retention. Generally, at Texila American University, students arrive in the morning active and ready

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to learn as compared to in the afternoon in which students' mood and attitude toward learning decrease. Also, the heavy credit subjects (Physiology, Anatomy, Pathology) are mostly taught in the morning in an effort to take advantage of the students' high attitude to morning lectures, while the low credit subjects (Genetics, Medical Ethics) are taught in the afternoon.

Methodology

The researchers sent online questionnaires via Google Forms to Texila American University students, specifically the MD1, MD2, and MD3 students, in December 2021, in order to identify the students' preferences regarding morning classes as opposed to afternoon classes. Information was taken from first-hand observation, participant's observation (primary research), and secondary sources. A questionnaire was given to each student in our inclusion criteria in order to get data to represent a wide population.

Research members were given specific roles and tasks to be done starting from April 2021. All task for each section of the research were completed within a week, and the research continued escalating more tasks continued being issued out because the flow of the resources were being gradually increasing making the research and our hypothesis more effective. With the work being shared, the research was completed in a couple of months before the end of 2021.

A self-developed questionnaire was prepared to determine students' preference for the timing of lectures. The questionnaire was developed based on knowledge collected by the researchers during the literature review. It was written in English, with the cover page presenting the consent form and an explanation about the purpose of the study. Additionally, the confidentiality and sole use of the information for the mentioned purpose were ensured. The research design was reviewed and approved by the ethical committee of Texila American University.

The questionnaire consisted of three sections. The first section included the following demographic data: gender, and student level. The second section was about lectures (preferred lecture length, timing of lecture schedule, and attendance). The third section was about the participation of students during the various timing of lectures.

Results

The questionnaire was distributed to male and female medical students in the MD1-MD4 category at Texila American University. A stratified sampling method was applied to collect a sample of 173 participants who participated in the survey.

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16. Descriptive and crosstab analyses were used to compare the students' preferences for each school and between males and females in general. The chi-square test was used to measure the significance level (P=0.05).

A total of 173 students participated in the study, of which 59 males and 114 females. The majority of the responses came from the MD3 class, which was 38% of the Responses. Based on the responses, it could be seen that many students stated feeling more energized during the morning class (44%) as opposed to afternoon classes which come in a close second, which is statically important. When Students were tasked with the question "whether they rise early or not" as to determine the level of energy in the morning. Many responded to rising early in the morning (72%).

The majority of the students preferred morning Lectures and stated that they understood lectures better in the morning, which helps them in academic performance. A vast majority of students responded to being very eager to participate in the morning class as opposed to participating in the afternoon classes, with about 14% stating very eager to participate during the afternoon lectures. The majority of the students who participated in the survey

admitted to the majority of their effort into morning classes (65%) as opposed to afternoon classes. Taking into account of the students' emotions on how they feel before and after classes during a particular period of the day. It was discovered that the majority of the students feel great before and after morning classes as opposed to afternoon classes.

The study shows majority of students are more attentive during morning classes as opposed to afternoon classes.

Discussion

The study was conducted on January 20, 2022, at Texila American University. A survey was sent out in which a Total of 173 students agreed to participate in the study. It is the intention of the researchers to find out the extent to which the timing of classes affects students at Texila American University and their attitudes towards them. We saw where the student had a more positive response especially emotionally, towards morning classes, where students can gain more understanding which proved our hypothesis. The decline in the number of students interested in afternoon classes worldwide underscores the importance of this research into the preferences of the students at a medical school like the Texila American University. The students may not be aware of how much their emotions towards the class/lecture affect what they learn and in the long run, affects the type of doctor they become.

Our findings support those from the 'Journal of Education and Practice (2016)' [3]. It was mentioned that a study conducted by Klein (2001) revealed that there were significant differences in attention levels at different times of day and the later the hour, the lower the level of attention. Both our findings showed that students who preferred morning classes paid more attention than afternoon classes. In addition, According to the States University Blog site (2021), Like Day and Night[4]: "The Difference between Day Classes and Night Classes", technically, there is absolutely no difference structurally and content-wise between day (morning) classes and night classes, but if you would ask anyone who has taken both, they would tell you that there is definitely a difference between the two, so much so that many students prefer one over the other, and the particular personality of the student is by no means any less of a contributing factor. In fact, the students at Texila American University did agree that there was a difference in the timing of classes, and the majority preferred morning classes to afternoon classes.

In this current study, a high percentage of students (58%) preferred morning lectures. This result is not in agreement with a previous study by Barron et al. [5], who reported that the mastery skills of below-grade-level students are affected by the time of day they receive the lecture. They found an overall increase in the mean scores for below-grade-level students who received instruction in the afternoon compared with those in a similar group who received instruction in the morning.

Limitation

The researchers encountered problems in carrying out this research. These problems include:

1. The fact that it was not possible to evenly distribute the questionnaires across each MD class as it was done through google forms.
2. Another drawback also encountered in using questionnaires as a source of data collection is that questionnaires have to be explained in much more details to some of the students in data collection; this caused the researcher a small amount of time. Despite all that the questionnaires helped the researcher to understand the problem better than before.
3. Also, the secondary sources had a downfall, in that the researchers were unable to gather information from a source within Guyana and much wider the Caribbean. Despite this, the sources contributed to the researcher's understanding of the problem in that they

cited examples and gave an enormous number of details.

Conclusion

The researchers assessed the differential effect on Students' receptiveness to morning classes. The focus was on the emotions/attitudes of the students in MD1 to 4 at the Texila American University. Our hypothesis that the majority of students prefer morning classes as opposed to afternoon classes was proven to be true as the majority of them had a more positive attitude and mood towards it and therefore were more attentive during the morning classes as opposed to the afternoon classes.

Despite several limitations, this study illustrated the following:

1. Lectures should be performed in ten-to-fifteen-minute blocks, which could involve changing the pace every fifteen minutes or so to relieve monotony and recapture students' interests.
2. Teachers should consider the time of day when they plan and implement lectures, as ongoing research indicates that the time of day plays a significant role in students' learning.
3. Lectures should be more engaging, especially during the afternoon sessions, to capture the attention of the students.

A total of 173 students participated in the study. There were 59 males and 114 females.

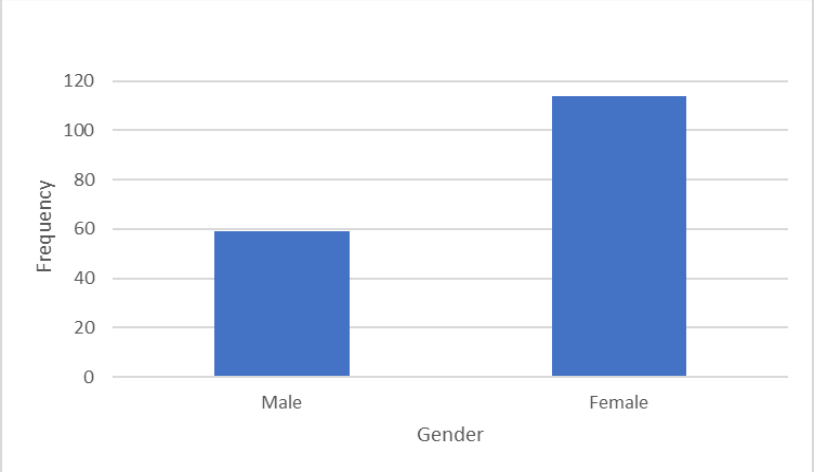

Figure 1. The Frequency of Gender who Partook in the Research

The majority of the responses came from the MD3 class, with about 38% of the Responses.

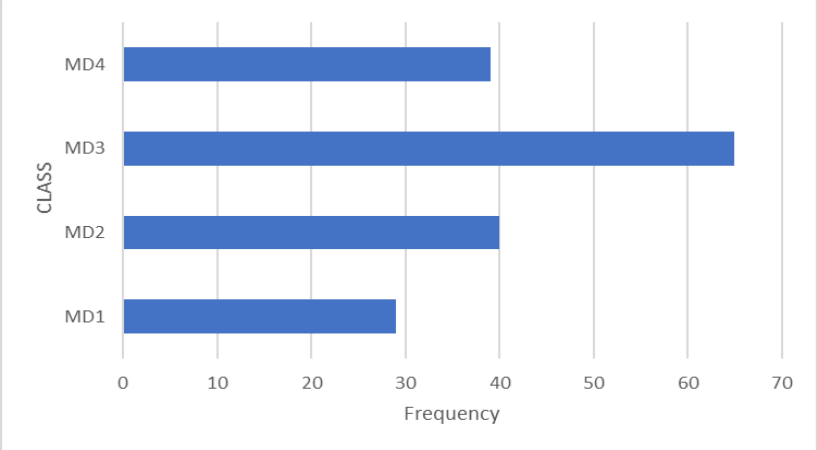

Figure 2. The Amount of Responses Received from Various Classes in the School

We had the highest responses from MD3

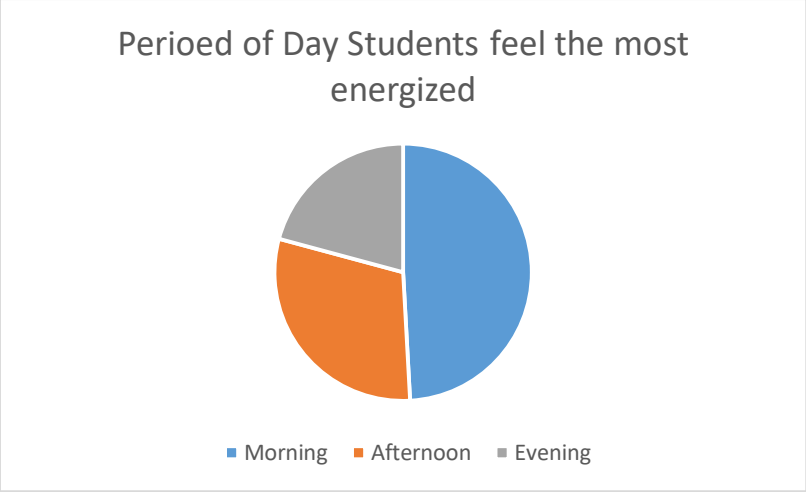

Figure 3. The Period of the Day Student's Feel the Most Energized

Many students stated feeling more energized during the morning class (49%) as opposed to afternoon classes which come in a close second, which is statically important.

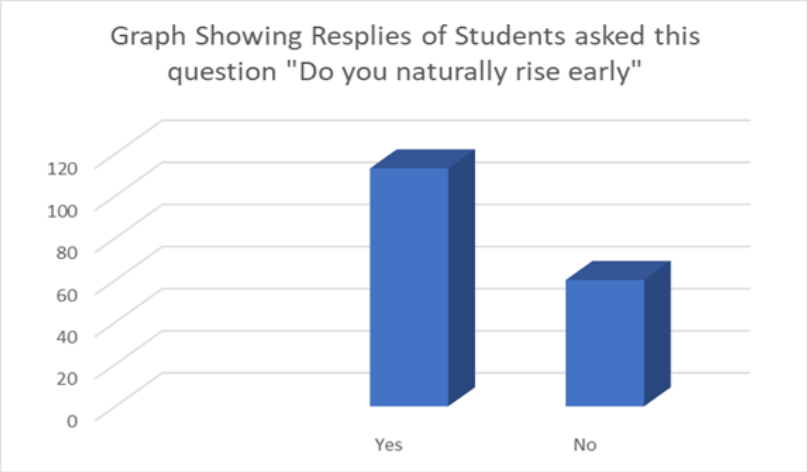

Figure 4. Number of Students who Rise Early in the Morning

When Students were tasked with the question "whether they rise early or not," as to determine the level of energy in the morning. Many responded to rising early in the morning (72%)

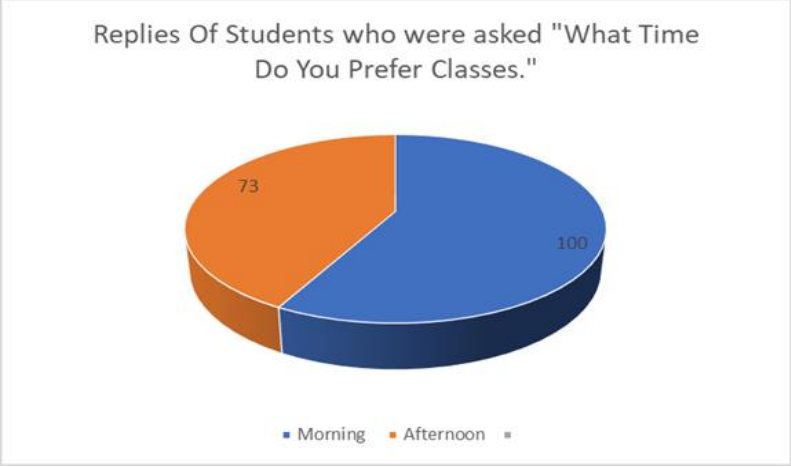

Figure 5. Period of the Day Students Prefer Classes

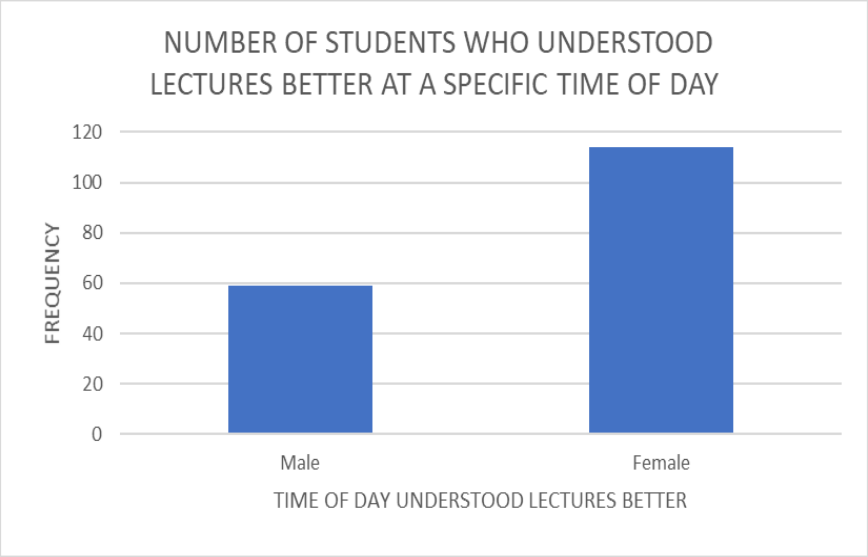

Figure 6. Number of Students who Understood Lectures Better at a Specific Type of Day

The majority of the students preferred Morning Lectures and stated that they understood lectures better in the Morning, which helps them in academic performance. A vast majority of students responded to being very eager to participate in the morning class as opposed to participating in the afternoon classes, with about 14% stating very eager to participate during the afternoon lectures.

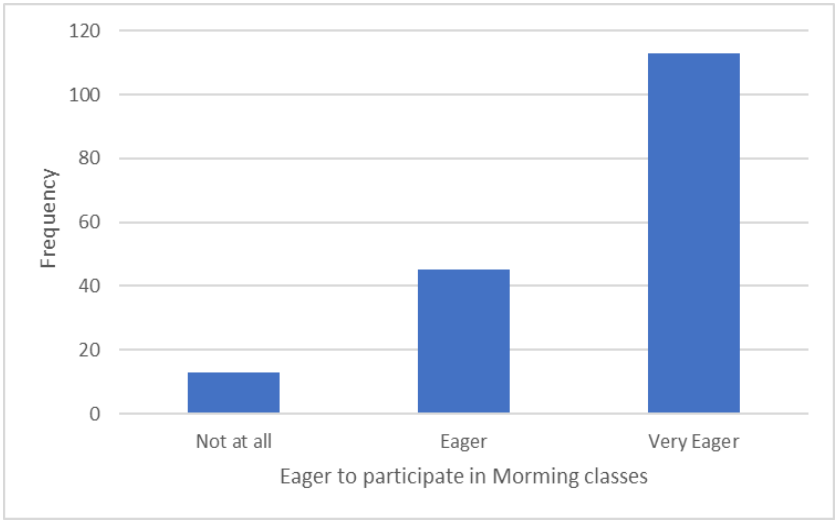

Figure 7. Number of Students Stating how Eager they are to Participate during Morning Classes

A large percentage of students are very eager to participate during morning classes indicating their willingness of students to participate during morning classes.

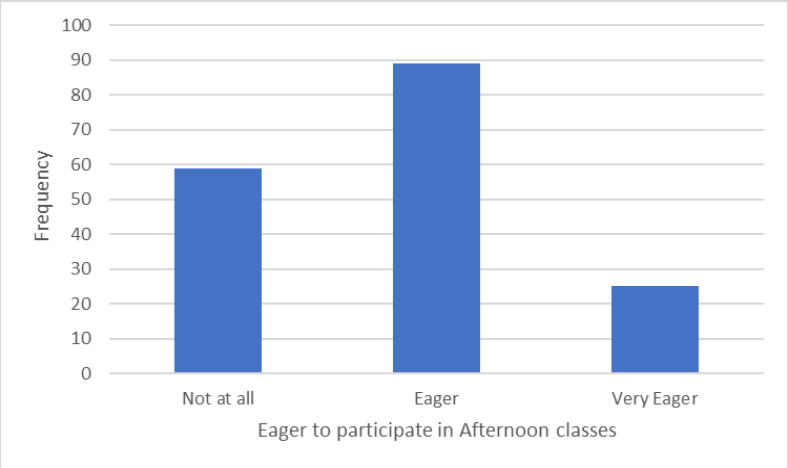

Figure 8. Percentage of Students Eager to Participate during the Afternoon Classes

A large response admitted to being eager to learn during the afternoon classes as opposed to the percentage of students who are very eager to learn during the morning classes indicating swindling interest as the day goes by.

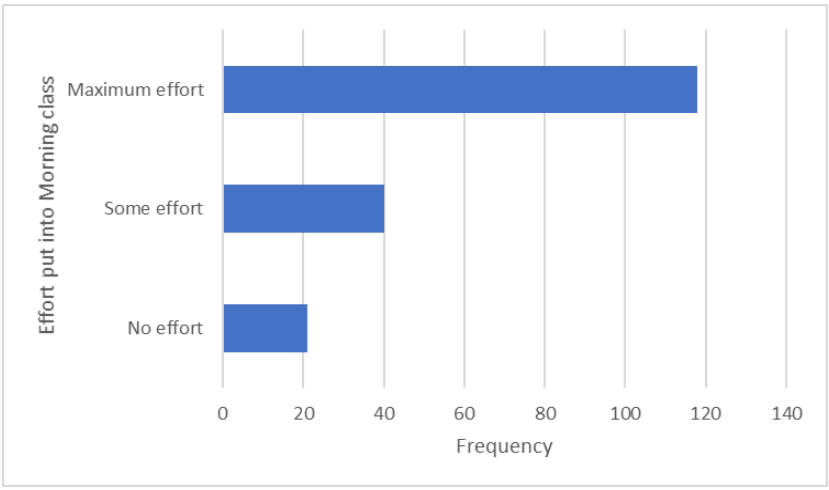

Figure 9. Frequency of Student's Effort during the Morning Classes

The majority of the students who participated in the survey admitted to the majority of their effort into Morning classes (65%) as opposed to afternoon classes.

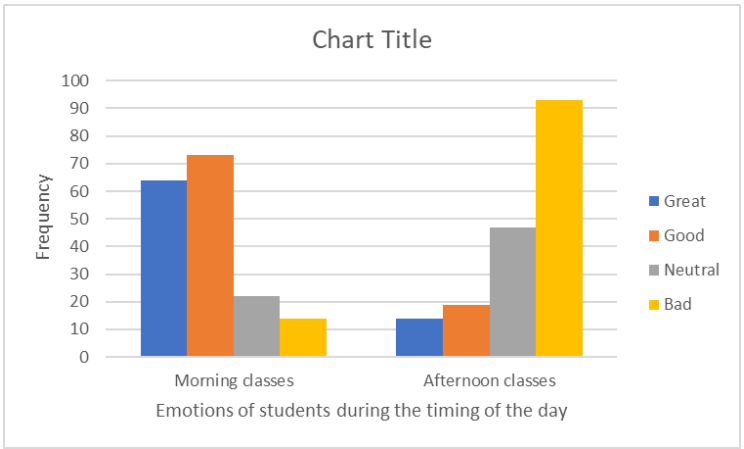

Figure 10. Various Emotions Students feel during the Morning Classes and Afternoon Classes

Taking into account the students' emotions on how they feel before and after classes during a particular period of the day. It was discovered that the majority of the students feel Great before and after Morning classes as opposed to afternoon classes.

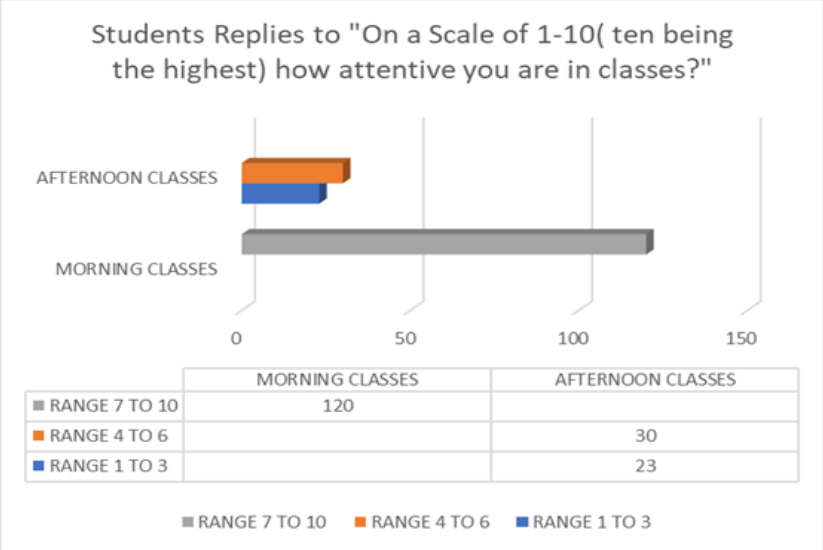

Figure 11. Distribution on how Students are Attentive during the Morning Classes

The Study shows Majority of students are more attentive during morning classes as opposed to afternoon classes.

Conflict of Interest

No potential conflict of interest was declared by the authors.

Acknowledgement

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Angle of Humeral Torsion: Comparative Analysis with Length and Mid-Shaft Circumference

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Abstract

The humeral torsion angle is a bony twist of the head of the humerus formed between the proximal and distal articular axis of the humerus, which is essentially significant to measure as it depends on biological activity. The present study was conducted with the aim to document anthropometric variables so as to provide a frame for prosthesis design of humeral components in arthroplasty. A total of 50 dry, normal adult human humeri were obtained from the Department of Anatomy in Nobel Medical College and teaching hospital to measure the angle of torsion, length, and mid-shaft circumference of each bone. The measurement of the angle of humeral torsion was performed by the Kingsley Olmsted method, whereas length and mid-shaft were measured with measuring tape. The data analysis was done in SPSS version 17 to correlate and compare the means. The average (mean± SD) angle of torsion for 50 unpaired dry humeri of both sides was compared and found to be statistically significant (p= 0.004, Right= 66.24± 8.67°, Left= 59.56± 6.7°). Mid-shaft circumference was positively correlated with the angle of torsion and was statistically significant (p=0.012, r= 0.351). The study concludes that mid-shaft circumference was found to be more with a large angle of humeral torsion, but there was no significant correlation with the length of the humeral shaft.

Keywords*: Arthroplasty, Humeral torsion, Humerus, Kingsley Olmsted, Mid-shaft, Prosthesis.*

Introduction

The development of the upper extremity in humans as appendages known as the humerus and the bony twist of the humeral head formed between the proximal and distal articular axis is known as humeral torsion. The angle of humeral torsion (AHT) is measured at the intersection of two lines: one that evenly bisects the articular surface of the humeral head proximally and the second being the trans-epicondylar line distally [1, 2].

The study revealed that the angle of humeral torsion essentially depends on biological activity [3]. Documents report the variations in the AHT depending on the type of usage of the upper limb in sporting activities [4]. Humeral torsion is generally lower in the populations participating in more strenuous activity and increased in less active subjects [5].

Different aspects of humeral torsion have been studied by several workers in different parts of the world. Studies show that humeral torsion may be primary or secondary torsion. Primary torsion present in the embryo is determined by developmental patterns and is a characteristic of various species. Secondary torsion is an outcome of the pull of muscular forces and functions etc. The external and internal rotators of the shoulder and arm region exert their force on the shaft of the humerus, which is responsible for the addition of secondary torsion [6]. An increase in thickness of the shaft of the humerus and altered humeral torsion was observed in professional baseball pitchers [7].

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The humeral torsion has been extensively studied in cases of Recurrent Anterior Dislocation of the Shoulder (RADS). The increase in the angle of humeral torsion is associated with an increase in RADS. Even minimal force can lead to dislocation in such cases compared to normal subjects [8]. So, the circumference of the shaft is also important in the measurement of the angle of humeral torsion. Clinical importance in the study of the angle of the humerus is extensive, and it has a wide range of applications for the improvement of orthopedic surgeries outcome [9].

Background

Humoral torsion and the comparative analysis between angle and length as well as circumference have not been well documented in the Nepalese population. This anthropometric analysis has application in clinical interventions.

The present study is a descriptive analysis of the angle of humeral torsion in dry bone and to determine the correlation of the angle of humerus with the length and mid-shaft circumference.

Material and Methods

This is a cross-sectional study carried out at the Department of Anatomy, Nobel Medical College & Teaching Hospital, and Research Center, Biratnagar, Nepal, from August 2020 to January 2021. Adult dry unpaired humeri of Nepalese origin of either sex available at the department of Anatomy were used for this study.

A total of 50 dry humeri, well preserved and undamaged, were segregated. All the segregated humeri of unknown gender were separated as right and left-sided, based on standardized anatomical criteria. These bones, collected from cadavers used by the anatomy department, belonged to adults of Nepalese origin. The equal number of both-sided humeri, 25 right-sided and 25 left-sided, were collected and included in this study.

The length and mid-shaft circumference of each dry humerus was measured with the help of measuring tape with the conventional method of measurement. In order to reduce the error, the process of measurement was repeated, and the average value was recorded.

Measurement of angle of humeral torsion was performed by the Kingsley Olmsted method [10]. The method measures the torsion angle by placing the specimen at the edge of a horizontal surface so that humerus head rests on the surface. Measurement includes two axes, the upper-end axis was passing through the center of the head of the humerus, extending from a point where the transverse diameter is maximum to the center point on the greater tuberosity of the humerus. The lower end axis was taken as the line passing between the centers of two epicondyles (lateral and medial epicondyle) of the humerus. The horizontal limb of a goniometer was fixed at the edge of the experimental table. The vertical limb of the goniometer was held parallel along the upper-end axis of the head and neck of the humerus. The horizontal surface represents the lower-end axis against which angle is measured with the upper-end axis of the head and neck of the humerus. The angle subtended was recorded in degree.

The investigator of our team randomly selected 50 bones for anthropometric measurement, and the value was recorded. The procedure of measurement and recording of observed values were repeated for Intra- and inter-observer reliability.

Statistical Data Analysis

The means and standard deviation (SD) of the angle of humeral torsion, length, and mid-shaft circumference for all 50 dry humeri from the right and left sides were calculated. The independent sample t-test was used to check for significant differences ($p<0.05$) between the right and left AHT. Pearson correlation analysis was done for the AHT with shaft length and mid-shaft circumference.



Figure 1. Measuring Length of Humeral Shaft



Figure 2. Measuring Mid-shaft Circumference

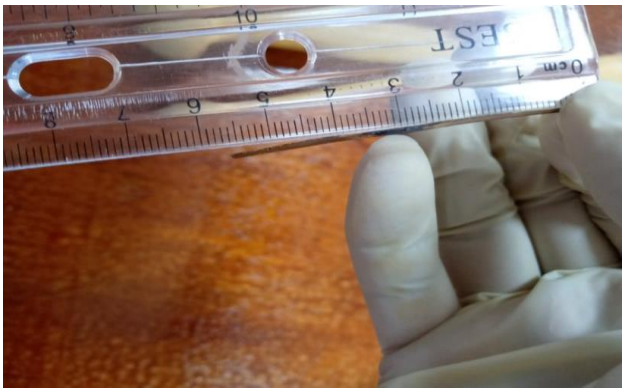

Figure 3. Measuring Mid-shaft Circumference



Figure 4. Measuring Angle of Humeral Torsion

Results

A total of 50 dry unpaired humeri obtained from the Anatomy Lab of Nobel Medical College and Teaching Hospital were measured for the angle of torsion, length, and midshaft-circumference separated as right and left-sided humeri.

Table 1 shows the average (mean± SD) angle of torsion for 50 dry humeri angle of torsion, 66.24±8.67° and 59.56±6.7° for right and left sides, respectively. Lengths were 28.56±1.73 cm and 28.16±1.49 cm for the right and left sides, respectively. Mid-shaft circumferences were 6.44 ±0.88 cm and 6.32± 0.77 cm for the right and left sides, respectively.

Table 2 shows the mean difference of anthropometric variables between the right and left humerus. Assuming the equal variance, the angle of humeral torsion shows a significant difference (p= 0.004), whereas the mean difference for length and mid-shaft circumference of the humerus were statistically non-significant.

Table 3 showed the Pearson correlation of angle of torsion with length and mid-shaft circumference, respectively, including all the right and left humeri (N=50). Although mid-shaft circumference and length were positively correlated with the angle of torsion, the mid-shaft circumference was statistically significant (p=0.012, r= 0.351), but the correlation with length was non-significant.

Table 1. Descriptive Anthropometric Variables of Humeral Bone

Variables	No. of Samples	Minimum	Maximum	Mean	Std. Dev.
AR	25	50.00	78.00	66.24	8.67
RL	25	26.00	31.00	28.56	1.73
RMC	25	5.00	7.50	6.44	0.88
AL	25	44.00	68.00	59.56	6.70
LL	25	25.00	30.00	28.16	1.49
LMC	25	5.00	7.00	6.32	0.77

AR - angle of torsion for right sided humerus.
RL - Length of right humerus.
RMC - Right mid-shaft circumference.
AL - angle of torsion for left sided humerus.
LL - Length of left humerus.
LMC - Left mid-shaft circumference.

Table 2. Comparative Analysis of Right and Left sided Variables of Humeral Bone

Variables (Equal variance assumed)		No of samples (N)	Sig (2-tailed)	Mean differ.	St Err. Diff.	95% Confidence Interval of the Difference	
						Lower	Upper
Angle	AR	25	0.004	6.68	2.19	2.27	11.08
	AL	25					
Length	RL	25	0.386	0.40	0.45	-0.51	1.31
	LL	25					
Circumference	RMC	25	0.624	0.11	0.23	-0.35	0.58
	LMC	25					

AR - angle of torsion for right sided humerus.
RL - Length of right humerus.
RMC - Right mid-shaft circumference.
AL - angle of torsion for left sided humerus.
LL - Length of left humerus.
LMC - Left mid-shaft circumference.

Table 3. Correlation of Angle of Torsion with Length and Mid-shaft Circumference

Independent variables(N=50)	Dependent Variable (Right and left)	Correlation (r)	Sig. (2-tailed)
Angle of humeral torsion	Length of shaft (N=50)	0.169	0.241
	Mid-shaft Circumference (N=50)	0.351	0.012

*Correlation is significant at $p < 0.05$ level (2-tailed)

Discussion

The present study evaluates the normal humeral angle of torsion with dry humeri collected in the Anatomy laboratory of Nobel Medical College and Research center. It is a descriptive and comparative study of the anthropometric variable of unpaired right and left adult humeri of unknown sex obtained from a cadaver.

Descriptive analysis of angle of torsion, length, and mid-shaft circumference in the present study shows 66.24±8.67° and 59.56±6.7°, 28.56±1.73 cm and 28.16±1.49 cm and 6.44 ±0.88 cm and 6.32± 0.77 cm in the right and left humerus respectively. Similar finding for the angle of humeral torsion has been reported at 66.84° ± 9.69° on the right side, whereas 63.31 ± 9.50° on the left side in a study population of Indian origin. The humeral mid-shaft circumference in the same population was 5.79 cm and 5.63 cm on the right and left sides, respectively, which were quite comparable with the present study (Rt= 6.44 ±0.88 cm and Lt= 6.32± 0.77 cm). The humeral length was 31.6 ± 2.21 cm and 30.33 ± 1.87 cm from the right and left sides, comparatively similar to the present study 28.56±1.73 cm in the right and 28.16±1.49 cm in the left [11].

In one of the studies by SS Dare et al., the angle of torsion was recorded as 54.54 ±0.69 and 58.71±0.66 degrees on the right and left side, respectively, in the male humerus. Similarly, 55.47±1.59 and 57.56±1.96 degrees on the right and left female humerus. The angle of torsion in the present study is quite close to the above finding. The difference can be explained due to population variation as humeral torsion is generally lower in the populations participating in more strenuous activity and increased in less active subjects (9).

On comparing the mid-shaft circumference with the angle of humeral torsion, a weak negative correlation on both sides was seen. Comparing the length with the angle of humeral torsion, the coefficient correlation showed a weak negative relationship on the right side and a weak positive relationship on the left side. So, we concluded that there is no relationship between length with the angle of humeral torsion. No statistical difference was seen in angles between right and left humeri ($p>0.001$). Though our study has a significant positive correlation between circumference and angle of humeral torsion, it has no significant correlation between length and angle of torsion though it has positive relation [11].

Comparing throwing and non-throwing arms of base-ball players**;** AHT of the throwing arm was documented to be more in right-handers than left-handers and was statistically significant (77° vs. 81°; $P < .001$). The present study has similarities as the mean angle of humeral torsion of right-sided humeri was significantly more compared to the left side [12].

Conclusion

Normative data related to the humeral anthropometric variables; angle of torsion, length, and mid-shaft circumference were obtained in the present study, which has an implementation in a surgical intervention like; the open reduction and internal fixation in the clinical practice of orthopedic surgeons. The

study documents the significant correlation between angles of humeral torsion with a mid-shaft circumference, which could be valuable information for Orthopedist in the planning of various surgeries along with prognostic evaluation of surgical conditions among populations of Asian origin.

Future Relevance

This study has documented the humeral angle, length, and mid-shaft circumference in Nepalese, which was found to be quite similar to Indian studies. Thus, not only the population-specific studies for anthropometric variation but also the radiographic evaluation can be expanded as supportive research in the future.

Acknowledgement

The authors would like to express sincere gratitude to the staff who all assisted in providing me the sample and helped a lot during data collection and measurement in the laboratory of Anatomy.

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The Effect of a Systematic Workout Routine on Medical Students' General Wellbeing and Academic Performance at the Texila American University

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Abstract

The purpose of this study is to discover how many students have a systemic workout routine. The members of this group aimed to investigate the types of workout routines the students practiced, how often they did so, and to determine the impact of a systematic workout routine on the well-being of medical students at Texila American University. This study was established from the responses of one hundred and twenty medical students at Texila American University to a questionnaire distributed by the members of the group via online. The questionnaire consisted of fourteen questions that mainly focused on the workout routine, well-being, and academic performances of each student. In view of the fact that "well-being can be understood as how people feel and how they function both on a personal and social level, and how they evaluate their lives as a whole,". The findings revealed that even though less than half of the students regularly worked out, having a workout routine, or simply exercising ever so often helped boost students' mood, strengthen their mental, emotional, and physical health as well as improve their academic performance overall. The results of our research were in accordance with our hypothesis, which was: "A regular workout routine has a positive effect on the general well-being and academic performance of medical students at Texila American University by improving brain function and mood." While the results obtained were in agreement with our hypothesis, they were somewhat hampered by the fact that only 43% (52 students) of our respondents had a systematic workout routine.

Keywords*: Medical students, Workout routine, Academic performance, General well-being.*

Introduction

In this research, the main focus will be on how a regular workout routine will impact the overall well-being and academic performance of medical students. The institution of focus will be Texila American University School of Medicine. Normally, people would agree that having a regular workout routine would be beneficial in many ways to an individual, such as, help them focus on other tasks to be completed, be more efficient at what they do and experience better results. However, there are a lot of factors that influence the academic performance of students, and these may include the environment, resources, time, physical activities, and many more.

With that being said, medical students have a very strenuous study program resulting in them dedicating most of their time to academics rather than physical activities. Therefore, it is important that they gain knowledge of the impact physical activities can have on their academic performances and their health. According to studies done by Sateesha, physical activities have a positive impact on the academic performances of medical students as it increases their concentration and their level of cognitive activity [1].

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Sateesha's research also indicated that brain functions might be improved due to an increase in the generation of energy which may then lead to the stimulation of new pathways in the brain. An article stated that a significant benefit of exercise is that it serves to promote the production of new brain cells, which will aid in improving cognition function, as was found by scientists [2]. Also, exercise helps the health and function of the synapses found between neurons allowing the brain cells to have better communication.

In regard to our mental health, research has shown that exercise can help us tap into our creative side [3]. To help keep a sound mind after an effective heart-pumping gym session can boost creativity and spontaneous thinking as hobbies are too important.

The aim of this research is to find out how many students at Texila American University have a workout routine and whether their workout routine has a positive or negative impact on their academic performance and general well-being.

Methods

Study Design

This cross-sectional research was conducted at Texila American University, Georgetown, Guyana. The effect of a regular workout routine on medical students' academic performance was evaluated by use of a questionnaire which was distributed through Google Forms. The advantages of using questionnaires as a method of data collection are many. When using questionnaires, it is efficient in the sense that it can be distributed quickly over the internet, and the cost is lowered. With the use of a questionnaire, the amount of responses is less likely to be limited than in other methods. In addition, online questionnaires allow the responder to remain anonymous.

Sampling Approach

The sampling method which was used was simple random sampling. In simple random sampling, the researchers choose random participants from a population. Every person within the population has the same probability of being chosen. The class lists were obtained from the Student Affairs Department. It is beneficial to use simple random sampling because the target population will definitely be reached, and sampling bias is nonexistent.

Recruitment of Participants

Participants were chosen from among the student body. They were primarily contacted via Learning Management System (LMS) and WhatsApp. Each person was given an option as to whether or not they would have liked to take part in the research. After approximately 24 hours, the researchers reached out to them once more to be informed of their decision. Once they agreed, the questionnaire was distributed. Messages were circulated across the class groups on Skype and WhatsApp in order to publicize the need for participation in the research.

Inclusion Criteria

In this research, the inclusion criteria contained students who were enrolled in the classes MD1 to MD 4.

Exclusion Criteria

Those students whose consent was not given did not participate in this research.

Data Collection

Over a period of two (2) weeks, the researchers collected data from a population of one hundred and twenty (120) medical students who are currently pursuing studies at the Texila American University (TAU) by developing and using a questionnaire. The researchers designed the questionnaire via Google Forms in the English language and distributed it to the current cohort of students in the University. In constructing the questionnaire, the researchers referenced data on the number of medical students who are currently enrolled in a fitness program. Through the questionnaires, the

researchers discovered the various types of workout routines that these students utilized.

Data Management

The researchers entered the data on an excel spreadsheet and fed it into the Statistical Package for the Social Sciences (SPSS) software which was used to generate the analysis. The information gathered was then organized into two categories; Persons who had a constant workout routine and persons who did not. Further, the files were stored as rows and columns.

The rows represented each student's response to the questions, whereas the columns represented the characteristic that was being measured, for example: How often do you visit the gym? Response – Never, Sometimes, often.

Data Analysis

Within the Data Analysis, the two comparison groups were:

1. Students with a systematic workout routine.
2. Students without a systematic workout routine.
3. Data were analyzed by use of Charts, Bar Graphs and Chi Square test.

Results

After distributing the questionnaire, the following results were obtained. A total of one hundred and twenty students responded to the questionnaire. Forty-eight of these students were male, and seventy-two were female. Forty-five students were in MD1, thirty-nine in MD2, nineteen in MD3, and seventeen in MD4 (See Table 1).

Table 1. Gender and Various Classes of Texila American University Students in the Study

Factors	Frequency (n = 120)	%
Gender		
Male	48	40.0
Female	72	60.0
Classes		
MD1	45	37.5
MD2	39	32.5
MD3	19	15.8
MD4	17	14.2

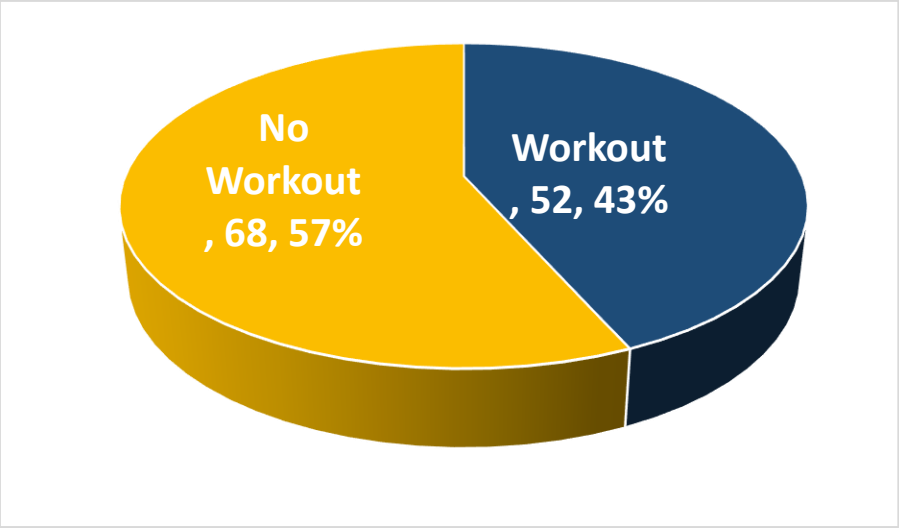

Figure 1. Frequency of having a Regular Workout Routine among the Studied Population

Figure 1 shows that Fifty-two students had a regular workout routine while sixty-eight did not. When it came to the number of times that a student worked out in a week, fifty students said they worked out once in a week, sixty-one students worked out twice in one week, and nine students worked out twice in one day. For each workout session, seventy-five students said their sessions usually lasted for twenty to thirty minutes, twenty-one students worked out for thirty-one to forty minutes, and nine students worked out for forty-one to fifty minutes. For fifteen students, their sessions lasted for fifty-one to sixty minutes (See Table 2).

Table 2. Main Characteristics of the Routine Workout Performed by Texila American University Students in the Study

Main characteristics	**Frequency (n = 52)**	**%**
Workout Frequency		
Once a week	9	17.3
Twice a week	40	76.9
Twice a day	3	5.8
Workout duration		
20 – 30 minutes	28	53.8
> 30 – 40 minutes	11	21.2
> 40 – 50 minutes	3	5.8
> 50 – 60 minutes	10	19.2
Workout place		
Gym	10	19.2
Home	40	76.9
Park	2	3.8

Seventy-six students believed that working out did have an impact on their academic performance. Forty-four students did not believe that having a workout routine impacted their academic performance. Of the students who said that having a workout routine impacted their academic performances, seventy-nine students said that it had a positive effect, and forty-one students said that it had a negative effect (See Table 3).

Table 3. Perceived Impact of the Workout Routine Performed by Texila American University Students in the Study

Perceived impact	**Frequency (n = 52)**	**%**
Feeling after workout		
Drained	14	26.9
Energetic	25	48.1
Neutral	13	25.0
Workout impact on mental health		
Relieves stress	27	51.9
Decreases depression	11	21.2
Sleeping better	11	21.2
Improves memory	3	5.8
Workout impact on academic performance		
Positive impact	34	65.4

Negative impact	1	1.9
No impact	17	32.7

Fifteen students stated that on a regular basis, they were very moody, twenty were slightly moody, sixty were neutral, and twenty-five students usually felt pleasant. When asked about the quality of their sleep, fifteen students responded saying that their sleep is usually restless, forty-six students usually slept well, and fifty-nine students had fluctuating sleep quality. In response to their levels of concentration, twenty-three students said that they usually find it hard to concentrate in class. Eighty-eight students had normal concentration, and nine students always had full concentration (See Table 4).

Table 4. Effect of Having a Regular Workout Routine on Texila American University Student's Mood, Concentration, and Sleep Quality

Students perceptions	**Routine Workout**				**Chi square p value**
	Yes (n = 52)		**No (n = 68)**		
	No.	**%**	**No.**	**%**	
Regular mood					
Very moody	6	11.5	9	13.2	0.060
Slightly moody	4	7.7	16	23.5	
Pleasant	15	28.8	10	14.7	
Neutral	27	51.9	33	48.5	
Concentration during class					
Hard to concentrate	8	15.4	15	22.1	0.262
Normal concentration	38	73.1	50	73.5	
Full concentration	6	11.5	3	4.4	
Regular Sleep quality					
Restless	7	13.5	8	11.8	0.106
Sleeps well	25	48.1	21	30.9	
Sleep quality fluctuates	20	38.5	39	57.4	

Thirty-four students chosen they had a positive effect from having a workout routine on their academic performance and eighteen had experience a negative effect on their academic performance, twenty-three students had given a reason for the positive effect on their academic performance, and twenty-nine of them had not given any feedback or statement for their answer (see Table 5).

Table 5. The Effect of Having a Workout on Academic Performance on Texila American University students either Positive or Negative Effect or the Feedback of the Students Experience on having a Positive or Negative Effect on Academic Performance

Perceived effect	**Frequency (n =52)**	**%**
Workout effect on academic Performance		
Positive effect	34	65.4
Negative effect	18	34.6
Students experience on either Positive or negative effect		
Reason given	23	44.2
Not stated	29	55.8

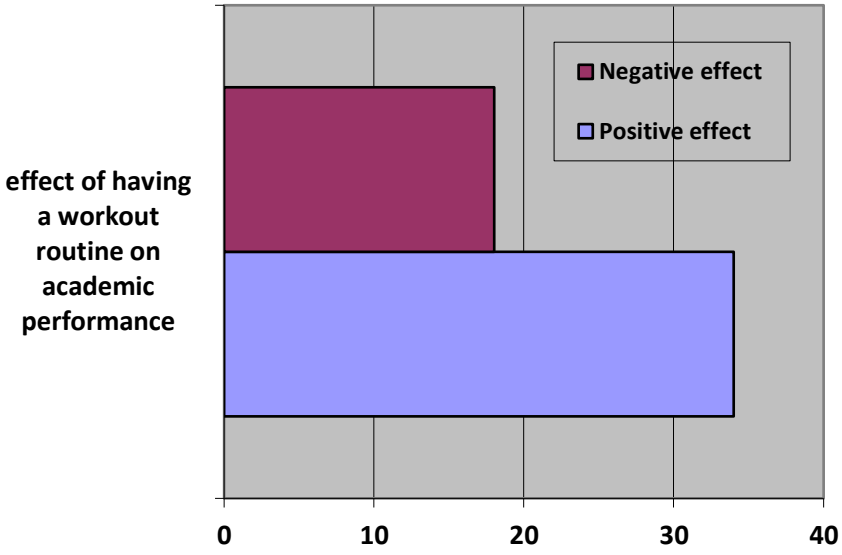

Figure 2. The Effects of a Workout Routine on the Academic Performance of Students

Figure 2 shows that thirty-four students are affected positively, and eighteen were negatively impacted on their academic performance while having a workout routine.

Discussion

As seen in the results, fifty-two students workout while sixty eight do not. Many students are aware of the benefits that working out would provide for them. However, many factors such as sleep habits, diet, social life, homework, and other extracurricular activities affect whether a person has a workout routine or not. This means that though the students might be aware of some of these benefits, they do not always take the necessary steps to implement a workout routine in their daily life [4].

While workout varies from person to person, it is recommended that persons have a workout session about three to five times each week to get optimum results [5]. Most students who work out revealed that they work out about twice a week, and some said once a week. The majority of students most likely prefer to work out once or twice a week due to the very busy schedule that comes with being a medical student. A lack of leisure time would lead them to prioritize their schoolwork, leaving them with little chance to work out more than two to three times a week. A minority of students [6] said that they work out twice a day, creating a stark contrast. This could be due to the possibility of them having a personal trainer or maybe being in a class with a smaller workload.

With respect to the results obtained, an analysis of the duration of time spent on the workout reveals that the most popular workout period was between 20 to 30 minutes. However, there has been a digression in the number of participants working out in a time period that exceeds 30 minutes, especially in the interval of 40 to 50 minutes in which the least number of participants were recorded. It would seem, therefore, that the shorter duration of 20 to 30 minutes workout interval is the preferred workout period. This would suggest that most medical students have a hectic schedule as it relates to their schoolwork and as such, is only able to dedicate this short time period to working out. However, studies have suggested that at least 20 minutes of exercise prior to studying can help to improve a student's concentration as well as focus effectively on their learning [7]. While between 20 to 30 minutes workout period was the preferred choice, above three-quarters of the cohort of medical students preferred to work at home. This suggests that the greater majority of

medical students prefer a median of 35 minutes of safe and private workouts. Further, while a gym can provide a dedicated space, home workouts can provide more flexibility as well as more efficiency [8]. There is a direct correlation between the energetic impact of a workout and the 20 to 30 minutes interval. On the other hand, there was almost no improvement in memory as an impact on mental health even though more than half felt relief in stress. The decrease in depression and sleeping better share the same impact on mental health.

When looking at the positive impact of this workout routine on academic performance, a great majority of the medical students felt a positive impact. Again, we see a positive correlation of workouts on academic performance. When the dimensions of regular mood after the exercise regime were measured, the most popular one was 'neutral'. This could be due to the fact that they might be torn between feeling physically tired and feeling motivated to do their schoolwork. Most of the medical students' perceptions, on the other hand, revealed no effect on being slightly moody after the workout routine. As for perceptions sited on normal concentration, almost the same number recorded a 'yes' or a 'no'. The quality of sleep derived from regular exercise were shared with the majority of medical students.

When it came to whether working out has a positive or negative effect on academic performance, thirty-four students said it has a positive effect while eighteen said it does not have a positive effect. This supports our hypothesis that having a systematic workout routine will allow the person to see an improvement in their academic performance. According to a study done, "Research shows that physical activity – whether it's team sports, bike riding, swimming at the beach or playground games – has positive effects on the brain and on school performance." [8]. However, some students said that having a workout routine had a negative impact on their performance. Some said that it caused them to lose focus on their schoolwork, while some said they were not sure and that working out did not reflect on their class behavior. This could possibly be due to the employment of different types and timings of workout sessions.

Conclusion

Having a regular workout routine is very beneficial to one's health and can help a person to lose weight or gain muscle. However, it is not limited to only these advantages. Having a regular workout routine can improve a person's general well-being, brain function, and even their academic performance. This study was conducted by students of MD1 into MD2, and it proved the thesis of "A regular workout routine has a positive effect on the general well-being and academic performance of medical students at Texila American University by improving brain function and mood." to be accurate. This is because of the fact that exercise tends to alter the brain's neurotransmitter and synapse activity in a positive manner and allows students to feel relaxed and receptive to the information given to them. Through this research project, the members hope that this information can be spread to not only Texila students but also other medical students so that they are able to learn about and benefit from the advantages of a workout routine for students.

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Conflict of Interest

There was no conflict of interest during the process of conducting this research.

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A Review of Cooking Oils (Coconut and Palm Oil) as Blood Plasma Regulator

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Abstract

Cooking oils are major sources of fatty acids and hence, play a major role in altering one's cholesterol level. Two major forms of cooking oil are coconut oil and palm oil. Both are produced locally in Guyana. However, there is limited usage of both for cooking purposes since the commercial oils, which are touted to be healthier, are used instead. Only poor communities and probably a few middle-income homes utilize these oils. These oils have a positive effect on blood plasma cholesterol by lowering HDL and LDL based on the review of research carried out by various researchers.

Keywords: *Blood plasma; Cholesterol; HDL; LDL; Oils; Saturated fatty acids; Unsaturated fatty acids.*

Introduction

Medical Biochemistry is the study of the chemical processes and transformations in living organisms. To understand the complexity of the human body, it is necessary to understand the individual molecules that are responsible for its proper functioning [1].

An important component of the body is the molecule cholesterol, steroid alcohol. Cholesterol ($C_{27}H_{45}OH$) was identified in solid form by researchers in gallstone in 1784 and is derived from the Greek *chole-* (bile) and *stereos* (solid). Cholesterol is used for building cells and hormone production. Excess cholesterol in the blood results in the formation of plaque. A large amount of plaque increases the chances of having a heart attack or stroke [1].

Cholesterol can be classified based on the amount of lipid and protein ratio it comprises. HDL (high-density lipoprotein) cholesterol binds in the bloodstream and removes fat from the body to take it to the liver. This is sometimes called "good" cholesterol. A high level of HDL cholesterol may lower your chances of developing heart disease or stroke [2].

LDL (low-density lipoprotein) cholesterol carries mostly fat and only a small amount of protein from the liver to other parts of the body. It is sometimes called "bad" cholesterol. A high LDL cholesterol level may increase your chances of having heart disease [2].

VLDL (very low-density lipoprotein) cholesterol contains very little protein. The main function of VLDL is to distribute the triglycerides produced by your liver. A high level of this can cause serious damage to the heart since it builds up in the artery walls and causes plaque [2].

Triglycerides are fat in the body for energy storage. Only a small quantity is present in the blood. Having a high triglyceride level along with high LDL cholesterol may increase your chances of having heart disease more than having only a high LDL cholesterol level [2].

As per the recommendations of medical experts, screening of cholesterol and triglyceride to assess the problems related to

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cholesterol, total cholesterol and HDL levels is also measured by some for routine analysis. [2].

Fatty acids present in the diet can either raise or lower one's cholesterol depending on the type and source it comes from. Listed below are the two major classes of fatty acids and their specific properties.

Saturated fatty acids do not contain any double bonds or other functional groups along the chain. The term "saturated" refers to hydrogen, in that all carbons (apart from the carboxylic acid [-COOH] group) contain as many hydrogens as possible. In other words, the omega (ω) end contains 3 hydrogens (CH_3-), and each carbon within the chain contains 2 hydrogens. Some of the commonly occurring fatty acids include:

1. Lauric (dodecanoic acid): $CH_3(CH_2)_{10}COOH$ or C12:0.
2. Myristic (tetradecanoic acid): $CH_3(CH_2)_{12}COOH$ or C14:0.
3. Palmitic (hexadecanoic acid): $CH_3(CH_2)_{14}COOH$ or C16:0.
4. Stearic (octadecanoic acid): $CH_3(CH_2)_{16}COOH$ or C18:0.

Unsaturated fatty acids are of similar form, except that one or more alkenyl functional groups exist along the chain, with each alkene substituting a singly-bonded " $-CH_2-CH_2-$" part of the chain with a doubly-bonded "-CH=CH-". Examples of unsaturated fatty acids:

1. Oleic acid: $CH_3(CH_2)_7CH=CH(CH_2)_7COOH$ or *cis*-Δ^9 C18:1.
2. Linoleic acid: $CH_3(CH_2)_4CH=CHCH_2CH=CH(CH_2)_7COOH$ or C18:2.
3. Alpha-linolenic acid: $CH_3CH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_7COOH$ or C18:3.
4. Arachidonic acid: $CH_3(CH_2)_4CH=CHCH_2CH=CHCH_2CH=CHCH_2CH=CH(CH_2)_3COOH$[NIST] or C20:4.
5. Eicosapentaenoic acid or C20:5.
6. Docosahexaenoic acid or C22:6.
7. Erucic acid $CH_3(CH_2)_7\mathbf{CH=CH}(CH_2)_{11}COOH$ or C22:1.

Cooking Oils

Cooking oils have been used for centuries and is part of cooking across the globe. For decades it was thought that coconut oil and palm oil have bad effects on cholesterol until it had found to have good cholesterol properties, especially coconut oil [3]. However, there seems to be a re-emergence of the usage of these oils since the public is being educated on the benefits of these two oils.

Coconut Oil

Coconut oil is derived from the plant *Cocos nucifera,* and it is used as a major source of cooking oil in India and other countries of the Asian sub-continent. Several other tropical islands also use coconut oil for cooking purposes. In Guyana, it was widely used by the Guyanese population, especially those in the country sides for cooking up until the early 90s. Now it is mainly used by the poor communities, but even they are changing to the commercial oils being imported or even made right here in Guyana. Coconut oil is a fat consisting of about 90% saturated fat. Saturated fatty acids (86.5%), monounsaturated fatty acids (5.8%), and polyunsaturated fatty acids (1.8%) are the constituents of medium chain triglycerides in coconut oil. Lauric acid (44.6%), myristic acid (16.8%), and palmitic acid (8.2%) constitute saturated fatty acids. Olieic acid (monounsaturated fatty acid) and linoleic acid (polyunsaturated fatty acid) are also present.

The melting point range for unrefined coconut is 20-25 °C with greater shelf life than the other oils up to the period of 2 years with its resilience to high temperatures. The solid form of coconut oil is good for long storage life with a temperature lower than 24.5 °C [4].

Coconut oil contains what are called medium chain fatty acids or medium chain triglycerides (MCTs for short). Most vegetable oils have

longer chain triglycerides (LCTs). Body fat is stored as LCTs, and energy usage is from MCTs that is burnt faster. Coconut is highly rich in MCTs.

Much of the recent research done on coconut oil focused on lauric acid (an MCT), the most predominant fatty acid chain found in coconut oil. Coconut oil is highly rich in lauric acid and medium chain fatty acids. Many studies have been done to study the anti-microbial and anti-viral properties effect of lauric acid. Due to antibiotic resistance to many strains of bacteria, the treatments are becoming ineffective. The dietary consumption of lauric acid in breast milk or in coconut oil tends to inhibit the growth of several bacteria and viruses, including listeria monocytogenes and helicobacter pylori, and protozoa such as *Giardia lamblia* by its conversion to monoglyceride called monolaurin. HIV, measles, herpes simplex virus-1, vesicular stomatitis virus, influenza, and cytomegalovirus have been destroyed by monolaurin based on some of the experimental works done. It has also been reported that MCTs in coconut oil us highly effective against yeast infections (*Candida*) [3]. Among the other, touted benefits of coconut oil include the lowering of LDL-c and the raising of HDL-c.

Palm Oil

Palm oil (*Elaeis guineensis*) is also effective against cholesterol and is used in many countries in cooking. It is manufactured right here in Guyana by the Pomeroon oil mill. Palm oil is a form of edible vegetable oil obtained from the fruit of the Oil palm tree. It is the second-most widely produced edible oil, after soybean oil. Palm oil is found in the fleshy portion of the fruit (mesocarp), whereas palm kernel oil is found in the kernel or the seed of the fruit. Fatty acid composition is different in the two types of palm oil. Palmitic acid (44%), stearic acid (5%), oleic acid (39%), and linoleic acid (10%) are the constituents of palm oil. Myristic acid and lauric acid are present in present in insignificant quantity.

Palm kernel oil is similar to coconut oil in its constitution. Lauric acid (48%), myristic myristic (16%), and palmitic acid (8%) are the main components of palm kernel oil [5]. Among the touted health benefits of palm oil, most notably, red palm oil are rich in beta-carotene, especially red palm oil. Carotenoids are 15 times more in crude palm oil when compared to carrots. The immune system is boosted by carotenoids through various mechanisms and improvement in cardiovascular system. Red palm oil (processed palm oil) retains 80% of the original carotenoids with a good source of Vitamin A [6].

Palm oil is rich in tocotrienols with antioxidant property is also important for other health benefits. Natural palm oil is a rich source of vitamin E (alpha, beta, gamma, and delta-tocopherols and alpha, beta, gamma, and delta-tocotrienols) with effective properties like antioxidant and anti-cancerous. Some of the research suggests that it may be important in inhibiting human breast cancer cells. Tocotrienols component of Vitamin E in palm oil plays an important role in the reduction of blood cholesterol by reaction with enzymes in the liver and is effective against skin aging, inhibition of oxidation of fat, lowering blood pressure, and other positive effects [6].

There are other minor components like linoleic acid (10%) is an essential unsaturated omega-6 fatty acid needed for human health, squalene (for cholesterol-lowering and anti-cancer effect), and ubiquinone (for energy). Co-enzyme Q10 is an important constituent in red palm oil [6].

Since it was established that the major type of fatty acid found in both coconut oil and palm oil is saturated, its importance of it in the body's chemistry is listed below [6]:

1. The cell membrane is made up of saturated fatty acids (50%) and provides structural support.

2. Saturated fats in our diet facilitate calcium metabolism and bone constitution.
3. Heart disease is indicated by lower LP in the blood.
4. Toxic effect of alcohol and some drugs on liver can be prevented by saturated fatty acids.
5. There is the enhancement of the immune system.
6. A diet rich in fatty acid contain elongated omega-3 fatty acids are retained in the tissues, thereby help in its utilization.
7. Saturated fatty acids like stearic acid (18 C) and palmitic acid (16 C) in food are good for heart and serve as a reserve of fat in stress periods.
8. Saturated fatty acids (short and medium) play an important role against harmful gut microbes.

Cooking Oil as Blood Plasma Cholesterol Regulator

Cooking oil has contributed to both the lowering and rising of "good" and "bad" cholesterol levels in man. For decades it was believed that coconut oil is responsible for the elevation of "bad" cholesterol. However, recent studies have shown the reverse. In research conducted by Enig [5], coconut oil lowers LDL and raises HDL. The coconut oil was natural and not hydrogenated. Hydrogenated coconut oil raises total cholesterol levels. According to another study by [7], diets rich in coconut and safflower oil in comparison to butter resulted in a reduction of cholesterol synthesis, which may be due to lesser production rates of apoB-containing lipoproteins. Experiments on rats showed that coconut oil was effective in changing the lipid composition of epididymal fat pads in comparison to the rats that were given a commercial stock diet. There was an increase in tissue cholesterol and reduction in phospholipids with a diet with safflower oil, whereas a diet with coconut oil resulted in a reduction of both tissue cholesterol and phospholipid concentrations [8].

Palm oil is considered a plant oil in which two types of cooking oil is made, palm seed oil and palm oil. Palm oil has almost 50% saturated fatty acid and 50% polyunsaturated fatty acid. Metabolites such as prostacycline is effective for antithrombosis in cardiovascular disease and variation in lipoprotein. [9] conducted the study on the serum lipid profile in rats due to palm oil, and results indicated that there was a significant increase in levels of serum cholesterol and HDL-c but no significant decrease in LDL-c and triglyceride. In another study conducted [10], the results showed that among hypercholesterolemic subjects (greater than 7.84 mmol/L) over a 4-week period after subjecting them to 200 mg gamma-tocotrienol/d, there was a 31% reduction in serum cholesterol that may be due to potent cholesterol inhibitor (gamma-tocotrienol) in palmitate capsules. [11] confirmed the previous studies on lowering of cholesterol in blood plasma in animals due to tocotrienols, naturally occurring compounds in grain and palm oils, and may be effective in humans as well.

There was a study done over a 5-week period on diet manipulation with palm olein, corn oil, and coconut oil on human subjects in different treatment groups. The results indicated that coconut oil increased total cholesterol in blood serum by 10% when compared to other groups. A subsequent diet with palm oil or corn oil to the groups indicated that there was a reduction in total cholesterol, LDL cholesterol, and HDL cholesterol [12]. The coconut oil with its important constituent Lauric acid (a saturated fatty acid) may have contributed to the results obtained, which is medium chain triglyceride (MCT) is not the storage fat but is useful for energy for the body. It is critical in lowering the bad cholesterol and increasing the good cholesterol apart from antimicrobial effects [3]. Palm oil, on the other hand, has a saturated fatty acid called palmitic acid which may have also contributed to raising HDL cholesterol but, unfortunately, raising LDL cholesterol in the process. However, these results cannot be taken

for granted since the experiment was only conducted for a short period of time, and there may not have been substantial evidence in supporting coconut oil as a better source of fatty acid that may lower cholesterol.

Conclusion

Cooking oils are an essential component in food and contribute positively to blood plasma cholesterol in terms of reducing HDL and LDL. Some oils like coconut and palm oil are used by communities across the globe that, including Guyana. These are known for essential properties that are responsible for some of the health benefits, as per a review of research done by the scientific fraternity.

Acknowledgement

None.

Conflict of Interest

The author declares that there is no conflict of interest.

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