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Assessing Knowledge and Awareness of HIV Pre-exposure Prophylaxis (PrEP) Among University Students in Nkurenkuru Town, Namibia

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Abstract *Pre-exposure prophylaxis (PrEP) is an effective biomedical strategy for preventing HIV transmission; however, its impact depends on adequate awareness, understanding, and willingness to use it, particularly among vulnerable groups such as university students. Evidence on PrEP awareness in semi-rural settings like Nkurenkuru Town, Namibia, remains limited. This cross-sectional study, conducted from January to December 2023 among 200 university students, used a structured self-administered questionnaire, with data analyzed using descriptive statistics and chi-square tests. Findings revealed low awareness, with only 25% of participants having heard of PrEP and just 10% demonstrating adequate knowledge of its use. Digital platforms (38.5%) and healthcare workers (30.5%) were the main information sources. Despite limited awareness, 72.5% of students expressed willingness to use PrEP if recommended by a healthcare professional. A significant association was found between prior awareness and willingness to use PrEP, with higher acceptance among those aware of it (90.0%) compared to those unaware (66.7%) ($\chi^2=13.67$, $p=0.008$). Although better knowledge was associated with greater willingness (90.0% vs. 70.6%), this was not statistically significant ($\chi^2=3.41$, $p=0.065$). Overall, while willingness to use PrEP is high, awareness and knowledge remain insufficient, highlighting the need for targeted educational interventions and increased involvement of healthcare providers to improve uptake among university students.*

Keywords *Awareness and Knowledge, HIV Prevention, Namibia, PrEP, Student Population.*

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Introduction

Pre-exposure prophylaxis (PrEP) is widely recognized as a key biomedical strategy for preventing HIV infection and has proven highly effective when taken consistently by individuals who are HIV-negative but at elevated risk. Nevertheless, the overall public health benefit of PrEP depends largely on levels of awareness, depth of understanding, and accessibility of youth-friendly prevention services. Namibia continues to face a generalized HIV epidemic, with adult prevalence estimated at approximately 12.6%, alongside notable regional differences. In the Kavango West Region, prevalence remains similarly high at around 12.1%, according to findings from the 2017 Namibia Population-Based HIV Impact Assessment (NAMPHIA) [37-40]. Within this setting, strengthening prevention strategies that effectively engage young people, particularly in semi-rural communities, remains a critical priority for public health efforts [1].

University students constitute a particularly important group for HIV prevention initiatives due to their increasing independence, expanding social networks, and greater likelihood of engaging in new sexual relationships, which may elevate exposure to HIV risk. Despite the expanding availability of PrEP services across Namibia, studies from southern Africa consistently report that uptake among university students remains suboptimal. This is often attributed to limited awareness, persistent misconceptions, stigma, and irregular interaction with healthcare services [2, 3, 15, 16]. Although global and regional research on PrEP has grown substantially, there is still a lack of context-specific evidence regarding awareness, knowledge, and attitudes among students in semi-rural environments such as Nkurenkuru, where access to prevention information and services may be less consistent than in urban areas [29].

In response to these gaps, the present study evaluated the level of awareness and knowledge of HIV pre-exposure prophylaxis among university students in Nkurenkuru Town, Namibia. It further examined the primary sources of PrEP-related information and assessed students' willingness to use PrEP. Additionally, the study explored the relationship between awareness and willingness to use PrEP, while also incorporating qualitative insights to better understand perceived barriers and enabling factors influencing PrEP acceptability within this population.

Purpose

This study was undertaken to evaluate the level of knowledge and awareness of HIV pre-exposure prophylaxis (PrEP) among university students in Nkurenkuru Town, Namibia. It specifically seeks to identify knowledge gaps, misconceptions, and informational deficiencies within this population. By doing so, the study aims to generate evidence that can guide the development of targeted educational interventions and awareness campaigns to promote the effective use of PrEP as a preventive strategy against HIV transmission.

Significance

Assessing PrEP-related knowledge among university students is of considerable importance for several reasons. University students represent a population that may be at increased risk of HIV infection due to evolving social behaviors, increased independence, and potential engagement in high-risk sexual practices. Improving awareness and understanding of PrEP within this group has the potential to reduce new HIV infections both among students and within the wider community. Furthermore, the findings of this study can support policymakers and public health practitioners in designing context-specific programs aimed at improving access to, and uptake of, PrEP services among young adults in Namibia.

Aim

The primary aim of this study was to assess the level of awareness and knowledge of HIV pre-exposure prophylaxis (PrEP) among university students in Nkurenkuru Town, Namibia.

Objectives

1. To evaluate students' general knowledge of HIV transmission and prevention strategies.
2. To determine the level of awareness and understanding of PrEP among university students.
3. To identify common misconceptions and perceived barriers that may influence PrEP awareness and potential utilization.
4. To examine the main sources through which students obtain information about HIV and PrEP.
5. To assess the relationship between PrEP knowledge and willingness to use PrEP.

Knowledge and Awareness of HIV and PrEP

Understanding the level of PrEP knowledge among university students requires consideration of evidence from similar settings. Studies conducted across Africa consistently indicate that while general knowledge of HIV transmission is relatively high among students, awareness and understanding of PrEP remain limited [5–13]. For example, research conducted in Namibia found that although students demonstrated adequate knowledge of HIV prevention, awareness of PrEP was insufficient, highlighting the need for focused educational interventions [2].

Comparable findings have been reported in South Africa, where university students exhibited moderate understanding of HIV prevention but limited familiarity with PrEP [3]. Additional cross-sectional studies have shown that awareness levels can be as low as 22%, further emphasizing the need for targeted educational strategies aimed at young populations [14].

Globally, systematic reviews have identified several barriers to PrEP uptake among university students, including limited awareness, stigma, concerns about potential side effects, and structural challenges such as cost and access to services [15]. A scoping review focusing on southern Africa similarly reported widespread knowledge gaps and emphasized the urgent need for context-specific educational programs tailored to university populations [16].

Evidence from Europe [18] and other high-income regions also demonstrates low levels of PrEP awareness, indicating that knowledge gaps are not limited to low- and middle-income settings [17]. These findings collectively suggest that increasing awareness and correcting misconceptions are essential steps toward improving PrEP uptake.

Studies conducted specifically in Nkurenkuru and similar contexts contexts [23] further reinforce these concerns. Previous research in the region has identified substantial gaps in knowledge, persistent misconceptions, and concerns related to PrEP effectiveness and side effects [19–22]. At the same time, evidence suggests that targeted awareness campaigns can significantly improve knowledge levels among students [20].

Research from other regions, including the United States, Australia, and Nigeria, consistently reports low awareness of PrEP among university students, often linked to inadequate sexual health education and limited exposure to HIV prevention information [24–26]. These findings highlight the global nature of the problem and the importance of strengthening education and communication strategies.

Knowledge, Awareness, and Barriers to PrEP Uptake

Existing literature indicates that limited awareness and insufficient knowledge remain

key obstacles to PrEP utilization among young adults. Studies have shown that uptake is strongly influenced by awareness levels, healthcare provider engagement, and accessibility of services [24]. Additionally, barriers such as stigma, fear of side effects, and low perceived risk of HIV infection continue to hinder adoption, while facilitators include accurate information and strong healthcare support systems [25].

In sub-Saharan Africa, willingness to use PrEP is often high despite low awareness. For instance, studies in Nigeria have demonstrated that individuals may be willing to use PrEP when adequately informed, suggesting that improving knowledge could significantly enhance uptake [26]. International guidelines from the World Health Organization and UNAIDS further emphasize the importance of integrating PrEP into comprehensive HIV prevention strategies, particularly for high-risk populations [27, 28].

Among university students in Africa, similar patterns have been observed. Research in Uganda reported low knowledge but generally positive attitudes toward PrEP, with stigma and misinformation identified as major barriers [29]. Additional studies have highlighted the role of social perceptions and fear of discrimination in limiting PrEP use among young people [30].

The growing influence of digital media digital media [32] has also transformed how students access health information. While online platforms can improve awareness, they may also contribute to misinformation if not properly regulated [31]. This underscores the need for accurate, evidence-based digital communication strategies.

Overall, the literature demonstrates a consistent pattern: while willingness to use PrEP is relatively high, inadequate knowledge, stigma, and inconsistent information sources continue to limit effective uptake.

Sources of Information on HIV and PrEP

Understanding the sources of information that university students rely on for HIV and PrEP-related knowledge is crucial for effective educational interventions. Shikwambi and Strode found that the internet and health professionals were the primary sources of information for students in Namibia [2]. Conversely, a study by Peltzer and Pengpid in South Africa revealed that university students relied heavily on peers and friends for HIV-related information [3].

This highlights the need for targeted interventions that utilize multiple channels, including online platforms, health professionals, and peer education programs, to disseminate accurate and comprehensive information about HIV and PrEP to university students in Nkurenkuru Town.

Materials and Methods

A cross-sectional mixed-methods study was conducted in Nkurenkuru Town, Namibia, between January and December 2023. The study incorporated both quantitative and qualitative approaches to provide a comprehensive understanding of PrEP awareness, knowledge, and perceptions.

Quantitative data were collected using a structured, self-administered questionnaire that captured socio-demographic characteristics, awareness and knowledge of PrEP, sources of information, and willingness to use PrEP. Qualitative data was obtained through focus group discussions guided by a semi-structured interview tool designed to explore perceptions, stigma, and barriers or facilitators influencing PrEP uptake.

Data analysis was performed using SPSS version 26.0. Descriptive statistics, including proportions and 95% confidence intervals, were generated, and chi-square tests were used to assess associations between variables. Statistical significance was set at $p < 0.05$.

Qualitative data was analyzed using thematic analysis to identify key patterns and themes.

The sample size was calculated using the single population proportion formula, assuming a 25% awareness level, 95% confidence interval, and 5% margin of error. After applying finite population correction [35] and adjusting for a 10% non-response rate, the final target sample size was 205 participants. Due to logistical considerations, 200 students were included in the study using a convenience sampling approach.

Ethical approval was obtained from the relevant ethics committee, and informed consent was secured from all participants. Confidentiality and anonymity were maintained throughout the study.

Study Design and Sampling Procedure

This study employed a cross-sectional design and utilized both quantitative and qualitative approaches to assess knowledge, awareness, and perceptions of HIV Pre-Exposure Prophylaxis (PrEP) among university students in Nkurenkuru Town, Namibia.

Study Population and Sampling Frame

The study population comprised registered university students enrolled in institutions located in Nkurenkuru Town during the 2023 academic year. In consultation with university administrations, enrolment records indicated an estimated total student population of approximately 500 students across different faculties.

Sample Size Determination

The sample size for the quantitative component was calculated using the single population proportion formula, which is widely recommended for cross-sectional studies assessing prevalence or awareness levels [1, 2]:

$$n_0 = \frac{Z^2 \times p(1-p)}{d^2}$$

Where Z = 1.96 corresponds to a 95% confidence level, p = 0.25 represents the expected proportion of students aware of PrEP based on preliminary findings, and d = 0.05 is the margin of error.

Substituting these values:

$$n_0 = \frac{(1.96)^2 \times 0.25 \times 0.75}{(0.05)^2}$$

$$n_0 = \frac{3.8416 \times 0.1875}{0.0025} = 288.12 \approx 289$$

Given that the total student population was relatively small (N = 500), a finite population correction [35] (FPC) was applied to adjust the sample size, as recommended when the study population is less than 10,000 [33, 34]:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$$n = \frac{289}{1 + \frac{288}{500}} = \frac{289}{1.576} = 183.4 \approx 184$$

To account for a potential 10% non-response rate, which is standard practice in survey-based studies [4], the final adjusted sample size was calculated as:

$$n = \frac{184}{0.90} = 204.4 \approx 205$$

Accordingly, a target sample size of 205 students was proposed. Due to feasibility considerations, a total of 200 students were ultimately recruited and included in the analysis, which is comparable to the calculated sample size and considered adequate for achieving the study objectives [36].

Sampling Technique

Participants were selected using a convenience sampling technique, with proportional representation from different faculties where feasible.

Quantitative data was collected using a structured, self-administered questionnaire. Qualitative data were obtained through focus group discussions (FGDs) using a semi-structured discussion guide to explore students' awareness of PrEP, perceptions, and associated barriers and facilitators.

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Survey Questionnaire

1. Development: A survey questionnaire will be developed based on existing literature and expert input.
2. Content: The questionnaire will consist of sections addressing demographic information, awareness of PrEP, understanding of PrEP, sources of information, attitudes towards PrEP, and intention to use PrEP.
3. Validity and reliability: The questionnaire will undergo pilot testing to ensure its validity and reliability.
4. Administration: The survey will be administered using an online platform or in-person, depending on the feasibility and convenience for the participants.

Limitations

Several limitations should be considered when interpreting the findings of this study. The cross-sectional design does not allow for causal inference between PrEP knowledge and willingness to use the intervention. Additionally, the use of convenience sampling may limit the generalizability of the results beyond the study population.

Data collection relied on self-reported responses, which may be subject to recall bias and social desirability bias, particularly given the sensitive nature of HIV-related behaviors. Furthermore, qualitative findings derived from focus group discussions may have been influenced by group dynamics, potentially limiting the expression of differing viewpoints.

Finally, the study was conducted in a single semi-rural setting, which may affect the transferability of findings to other contexts. Despite these limitations, the mixed-methods approach strengthened the study by providing both quantitative and qualitative insights.

1. The findings may not be generalizable to all university students in Namibia due to the specific sample selected.
2. There is a risk of social desirability bias in self-reported data.

Reporting

The findings of this study are presented in accordance with standard scientific reporting guidelines, including structured sections covering the introduction, methodology, results, discussion, and conclusion to ensure clarity, transparency, and reproducibility.

Table 1. Awareness of HIV Pre-Exposure Prophylaxis (PrEP) Among University Students (n = 200)

PrEp Awareness	Frequency (n)	Percentage (%)	95% Confidence Interval (%)
Yes	50	25.0	19.0 – 31.0
No	150	75.0	69.0 – 81.0
Total	200	100.0	—

Only one-quarter of the university students were aware of HIV Pre-Exposure Prophylaxis (25.0%; 95% CI: 19.0–31.0), while the majority (75.0%; 95% CI: 69.0–81.0) had never heard of PrEP. -This low level of awareness suggests that PrEP messaging has not sufficiently reached university students in Nkurenkuru Town, despite the ongoing HIV burden in the region.

The figure visually illustrates the marked disparity between students who were aware of PrEP and those who were not, reinforcing the quantitative finding of low PrEP awareness among university students.

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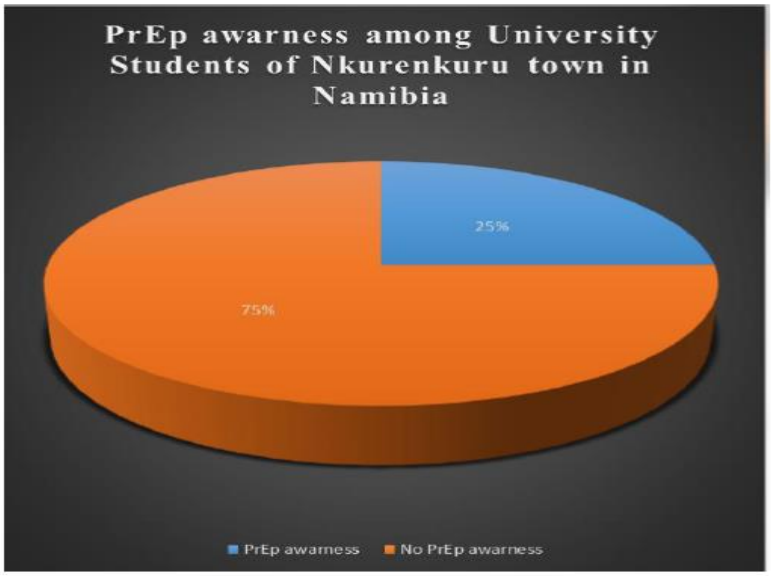

Figure 1. PrEP Awareness (Proportion Aware vs Not Aware)

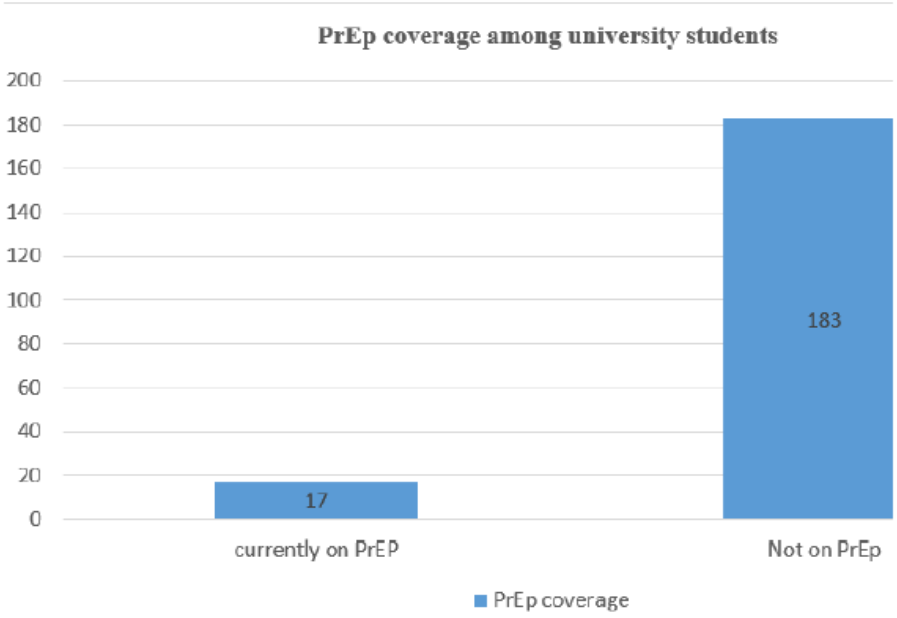

Figure 2. PrEP Uptake (Percentage of current users)

As per above figure2, the coverage of HIV PrEp among university student of Nkurenkuru town was low during our study period (January-December 2023) and it was noted that only 17 students from 200 were on PrEp representing 8.5% of the coverage. The figure highlights low PrEP utilization despite high willingness to use the intervention, emphasizing missed opportunities for HIV prevention among university students.

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Results

Table 2. Level of Knowledge of HIV Pre-Exposure Prophylaxis among University Students (n = 200)

Level of Knowledge	Frequency (n)	Percentage (%)	95% CI (%)
Good knowledge	20	10.0	5.8–14.2
Poor knowledge	180	90.0	85.8–94.2
Total	200	100.0	—

Legend: Good knowledge was defined as correct responses to key questions on PrEP purpose, eligibility, and use. Most students (90.0%) demonstrated poor knowledge of PrEP, with only 10.0% exhibiting good knowledge of its purpose and use. This finding highlights limited understanding of PrEP among students and suggests that awareness alone may not translate into accurate knowledge without structured education.

Table 3. Sources of HIV Pre-Exposure Prophylaxis Information among University Students (n = 200)

Source of Information	Frequency (n)	Percentage (%)	95% CI (%)
Internet	77	38.5	31.8–45.2
Healthcare providers	61	30.5	24.1–36.9
Friends/family	26	13.0	8.3–17.7
Other sources	36	18.0	12.7–23.3
Total	200	100.0	—

Legend: Multiple responses were allowed.

Table 4. Willingness to Use HIV Pre-Exposure Prophylaxis among University Students (n = 200)

Willingness to Use PrEP	Frequency (n)	Percentage (%)	95% CI (%)
Yes	145	72.5	66.3–78.7
No	55	27.5	21.3–33.7
Total	200	100.0	—

Legend: Willingness was assessed assuming PrEP availability and recommendation by a healthcare provider. Despite low awareness and knowledge, nearly three-quarters of students (72.5%) expressed willingness to use PrEP if recommended by a healthcare provider. This finding demonstrates high acceptability of PrEP and suggests a strong potential for uptake if awareness

Table 5. Association between PrEP Awareness and Willingness to Use PrEP (n = 200)

PrEP Awareness	Willing to Use PrEP	Not Willing	Total
Heard of PrEP	45 (90.0%)	5 (10.0%)	50
Not heard	100 (66.7%)	50 (33.3%)	150
Total	145	55	200

χ^2 (df = 1) = 13.67, p = 0.008

Legend: A significant association was observed between PrEP awareness and willingness to use PrEP. The internet (38.5%) and healthcare providers (30.5%) were the primary sources of PrEP information. This indicates that both digital platforms and healthcare settings are critical entry points for PrEP education. However, reliance on online sources may also expose students to misinformation, emphasizing the need for verified digital health communication.

Table 6. Association between PrEP Knowledge Level and Willingness to Use PrEP (n = 200)

Knowledge Level	Willing to Use PrEP	Not Willing	Total
Good knowledge	18 (90.0%)	2 (10.0%)	20
Poor knowledge	127 (70.6%)	53 (29.4%)	180
Total	145	55	200

χ^2 (df = 1) = 3.41, p = 0.065

Phi coefficient (φ) = 0.13 Willingness to use PrEP was higher among students with good PrEP knowledge (90.0%) compared with those with poor knowledge (70.6%). Although this association did not reach statistical significance (χ^2 = 3.41, p = 0.065), the observed effect size (φ = 0.13) suggests a positive trend, indicating that improved knowledge may enhance willingness as awareness expands.

Although willingness was higher among students with good knowledge, the association did not reach statistical significance. Students who had heard of PrEP were significantly more willing to use it compared with those who had not heard of PrEP (90.0% vs. 66.7%). The statistically significant association (χ^2 = 13.67, p = 0.008) indicates that awareness is a key determinant of PrEP acceptability among university students in Nkurenkuru Town.

Table 7. Self-Reported Current Use of HIV Pre-Exposure Prophylaxis among University Students (n = 200)

Current PrEP Use	Frequency (n)	Percentage (%)
Yes	17	8.5
No	183	91.5
Total	200	100.0

Current use refers to self-reported PrEP use at the time of the survey. Only 8.5% of students reported current PrEP use, demonstrating a large gap between willingness to use PrEP and actual uptake. This finding underscores the influence of barriers such as limited awareness, stigma, and access constraints.

Awareness of HIV pre-exposure prophylaxis (PrEP) among university students was low, with only 25% of participants reporting prior awareness, while the majority (75%) had never heard of it (Table 1). This disparity is clearly illustrated in Figure 1, which highlights the large proportion of students lacking awareness. These findings indicate a significant gap in exposure to PrEP-related information among students in Nkurenkuru Town.

Consistent with this, knowledge of PrEP was also limited. Only 10% of students demonstrated good knowledge regarding its purpose, eligibility, and correct use, whereas 90% had poor knowledge (Table 2). This suggests that even among those who are aware of PrEP, understanding remains inadequate.

Regarding sources of information, the internet (38.5%) and healthcare providers (30.5%) were identified as the primary channels through which students obtained PrEP-related information (Table 3). Other sources, including friends and family (13.0%), played a lesser role. These findings highlight the growing importance of digital platforms alongside healthcare systems in disseminating HIV prevention information.

Despite low awareness and knowledge levels, a substantial proportion of students (72.5%) expressed willingness to use PrEP if recommended by a healthcare provider (Table 4). This indicates a high level of acceptability of PrEP among university students.

A statistically significant association was observed between PrEP awareness and willingness to use PrEP (Table 5). Students who had heard of PrEP were significantly more

willing to use it (90.0%) compared to those who had not (66.7%) ($\chi^2 = 13.67$, $p = 0.008$).

Although willingness was higher among students with good knowledge (90.0%) compared to those with poor knowledge (70.6%), this association did not reach statistical significance (Table 6) ($\chi^2 = 3.41$, $p = 0.065$; $\varphi = 0.13$), suggesting a positive but limited influence of knowledge alone.

Actual uptake of PrEP was low, with only 8.5% of students reporting current use (Table 7). This is further illustrated in Figure 2, which shows the small proportion of students currently using PrEP. These findings reveal a clear gap between willingness to use PrEP and its actual utilization.

Qualitative Findings (Thematic Analysis)

Thematic analysis of the focus group discussions revealed four major themes related to students' knowledge, awareness, and perceptions of HIV Pre-Exposure Prophylaxis (PrEP). These qualitative findings complement the quantitative results and provide deeper insight into the observed patterns.

Theme 1: Limited Awareness and Superficial Knowledge of PrEP

Most participants reported little or no prior knowledge of PrEP, which aligns with the quantitative finding that only 25% of students had heard of PrEP and only 10% demonstrated good knowledge.

Many students expressed uncertainty about what PrEP is, how it works, and who should use it.

> *"I have heard the name before, but I don't really know what PrEP is or how it prevents HIV."*
>
> *"Some of us confuse PrEP with ARVs for people who are already HIV positive."*

This theme supports Table 1 (PrEP awareness) and Table 2 (PrEP knowledge), confirming widespread knowledge gaps.

Theme 2: Internet and Health Workers as Primary Sources of Information

Participants who had some awareness of PrEP reported obtaining information mainly from the internet and, to a lesser extent, from healthcare providers. This corresponds with quantitative findings showing the internet (38.5%) and healthcare providers (30.5%) as the main information sources.

> *"Most information I get about HIV prevention comes from social media or Google."*
>
> *"I only heard about PrEP when a nurse mentioned it during a clinic visit."*

However, students also noted that online information was often incomplete or confusing, contributing to misinformation.

This theme reinforces Table 3 (Sources of PrEP information).

Theme 3: Positive Attitudes and Willingness to Use PrEP Despite Low Knowledge

Despite limited awareness, most participants expressed openness and willingness to use PrEP if it was properly explained and recommended by a healthcare professional. This finding supports the quantitative result showing that 72.5% of students were willing to use PrEP.

> *"If a doctor explains it well and says it works, I will definitely use it."*
>
> *"I think it's good protection, especially for young people like us."*

This theme explains the statistically significant association between PrEP knowledge and willingness to use PrEP observed in **Table 3 ($\chi^2 = 13.67$, $p = 0.008$)**.

Theme 4: Misconceptions, Stigma, and Fear as Barriers to PrEP Uptake

Several misconceptions and concerns were identified as potential barriers to PrEP utilization. Some participants believed that PrEP could encourage risky sexual behavior or

feared that using PrEP would lead to being labeled as HIV positive.

> *"People might think you are sick if they see you taking pills every day."*
> *"Some think PrEP is a license to stop using condoms."*

Concerns about side effects and long-term medication use were also frequently mentioned.

These qualitative insights help explain why PrEP uptake remained low (8.5%) despite high willingness to use it.

Discussion

This study demonstrated low levels of PrEP awareness and knowledge among university students in Nkurenkuru Town, as shown in Table 1, Figure 1, and Table 2. These findings are consistent with previous studies conducted in Namibia and other parts of sub-Saharan Africa, which report limited awareness of PrEP despite relatively good general knowledge of HIV transmission.

Despite these knowledge gaps, willingness to use PrEP was high (Table 4), indicating that acceptability is not the primary barrier to uptake. The significant association between awareness and willingness (Table 5) suggests that awareness plays a critical role in shaping PrEP acceptability. Increasing awareness could therefore serve as a key entry point for improving PrEP uptake among university students.

Although students with better knowledge were more willing to use PrEP, the lack of statistical significance (Table 6) suggests that knowledge alone may not be sufficient to drive uptake without broader awareness, supportive healthcare systems, and accessible services. This finding aligns with existing literature emphasizing the importance of combining education with structural interventions.

The internet and healthcare providers were identified as the main sources of PrEP information (Table 3), highlighting important channels for intervention. However, qualitative findings indicated that online information may be incomplete or misleading, emphasizing the need for accurate, evidence-based digital health communication and stronger involvement of healthcare providers in PrEP education.

Furthermore, the low level of actual PrEP use (Table 7 and Figure 2) despite high willingness underscores the presence of additional barriers such as stigma, misconceptions, fear of being perceived as HIV-positive, and concerns about side effects. These barriers help explain the disconnect between willingness and actual uptake observed in this study.

Overall, the findings suggest that low PrEP uptake among university students in Nkurenkuru is primarily driven by limited awareness, misinformation, and social stigma rather than lack of interest. Addressing these barriers through targeted, youth-friendly educational interventions and improved healthcare engagement is essential for increasing PrEP utilization.

These findings are consistent with recent evidence from Zambia, where low awareness but high willingness to use PrEP among university students has been reported, highlighting persistent knowledge gaps despite favorable attitudes toward PrEP use [40].

Combined Quantitative–Qualitative Results Table (Mixed-Methods Integration)

Table 8. Integration of Quantitative and Qualitative Findings on PrEP Knowledge and Perceptions

Domain	Quantitative Findings	Qualitative Themes (FGDs)
Awareness of PrEP	25% of students had heard of PrEP	Most participants reported limited or no prior knowledge of PrEP
Knowledge level	Only 10% had good knowledge	Confusion between PrEP and HIV treatment (ART) was common

Sources of information	Internet (38.5%), healthcare providers (30.5%)	Internet and clinics identified as main but sometimes unreliable sources
Willingness to use PrEP	72.5% are willing to use PrEP	High willingness if PrEP is clearly explained by health professionals
Barriers to uptake	Low coverage (8.5%)	Stigma, fear of being labeled HIV-positive, and side-effect concerns
Knowledge–willingness link	Significant association ($\chi^2 = 13.67$, $p = 0.008$)	Participants emphasized that better knowledge would increase acceptance

Integration of quantitative and qualitative findings demonstrated concordance between low levels of PrEP awareness and widespread misconceptions identified during focus group discussions. Despite limited knowledge, both data sources revealed high willingness to use PrEP if accurate information and healthcare provider support were available.

Conclusion and Action-Focused Recommendations

The findings of this study demonstrate that both awareness and knowledge of HIV pre-exposure prophylaxis (PrEP) among university students in Nkurenkuru Town, Namibia, remain limited, with only a quarter of participants reporting prior awareness and a small proportion exhibiting adequate understanding of its use. Notwithstanding these gaps, a substantial majority of students indicated a willingness to use PrEP when recommended by a healthcare provider. Statistical analysis revealed a significant relationship between awareness and willingness to use PrEP, whereas knowledge showed a positive but statistically non-significant association with willingness.

These results suggest that improving awareness represents a crucial entry point for enhancing the acceptability of PrEP among university students. As awareness increases, strengthening accurate knowledge and addressing misconceptions may further facilitate uptake. Implementing targeted, youth-oriented educational interventions, reducing stigma associated with PrEP use, and reinforcing the role of healthcare providers in delivering clear and reliable information are essential strategies for converting willingness into actual utilization. Such approaches are particularly important in semi-rural settings, where access to accurate health information and services may be limited.

Key recommendations arising from this study include the incorporation of PrEP education into university-based health programs, alongside the strengthening of healthcare provider–driven counseling initiatives to ensure accurate and consistent messaging. In addition, the development and implementation of youth-centered awareness campaigns that address stigma and misconceptions are essential for improving acceptance of PrEP among students. Policymakers should also emphasize the delivery of reliable, evidence-based information through digital health platforms and ensure that PrEP services are readily available and accessible, particularly in semi-rural areas. Collectively, these strategies are critical for enhancing PrEP uptake and advancing national efforts aimed at reducing HIV transmission.

Declarations

The author declares that there is no conflict of interest regarding the publication of this paper.

Author Contributions

The author contributed to the conception and design of the study, data collection, analysis, and interpretation of results. The author also

prepared the manuscript and approved the final version for publication.

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Ethical Approval

The study involving human participants was reviewed and approved by the relevant Institutional Ethics Committee in Namibia. Written informed consent was obtained from all participants prior to their inclusion in the study. All procedures were conducted in accordance with ethical standards and guidelines for research involving human subjects.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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References

[1]. UNAIDS. Namibia country report. 2020. Available from: https://www.unaids.org/en/regionscountries/countries/namibia

[2]. Shikwambi E, Strode A. Assessment of HIV prevention knowledge, attitudes, and behavior among University of Namibia students. Afr J AIDS Res. 2019;18(1):63-72.

[3]. Peltzer K, Pengpid S. Knowledge, attitudes, and acceptability of pre-exposure prophylaxis among university students in the Western Cape, South Africa. PLoS One. 2018;13(10):e0205246.

[4]. Hlongwa M, Mashamba-Thompson TP, Makhunga-Ramfolo N. Knowledge, attitudes, and practices regarding pre-exposure prophylaxis among university students in South Africa: a systematic review. AIDS Res Hum Retroviruses. 2020;36(1):1-13.

[5]. Gareta D, Nhandara C. Knowledge, attitudes and practices on HIV prevention among university students in Zimbabwe: a systematic review. BMC Infect Dis. 2019;19(1):778.

[6]. Nangombe ND, Chivule J, Kazaize T, et al. Knowledge, attitude and practice of pre-exposure prophylaxis among students in a university in Nkurenkuru, Namibia. Afr J Reprod Health. 2020;24(1):136-45.

[7]. Muthelo E, Shikwambi K. Assessing the knowledge and attitudes of university students towards pre-exposure prophylaxis for HIV prevention in Nkurenkuru, Namibia. Int J Health Sci. 2019;7(2):23-32.

[8]. Lehoboro A, Godfrey-Faussett P, Andrianantoandro T, et al. Barriers to pre-exposure prophylaxis uptake among university students in South Africa. AIDS Care. 2020;32(7):899-908.

[9]. Mabaso M, Nxumalo Z, Van Rooyen H. Knowledge and awareness of pre-exposure prophylaxis among university students in South Africa: a systematic review. S Afr J HIV Med. 2021;22(1):a1270.

[10]. Ndlovu N, Van Zyl C, Mabaso M, et al. Knowledge and attitudes towards pre-exposure prophylaxis for HIV prevention. 2021.

[11]. Nyanza EC, Himunzowa GR, Mufune P, et al. Knowledge, attitudes, and barriers to pre-exposure prophylaxis among university students in Lusaka, Zambia. J AIDS Clin Res. 2020;11(7):872.

[12]. Chipungu J, Magadzire BP, Musemburi K, et al. Awareness, knowledge, and attitudes towards pre-exposure prophylaxis among college students in Harare, Zimbabwe. Int J Environ Res Public Health. 2022.

[13]. Ayinde BO, Ilesanmi OS. Knowledge and awareness of HIV/AIDS among university students in Southern Africa. Afr J Reprod Health. 2000.

[14]. Robbertse D, Strümpher J. Awareness and knowledge of pre-exposure prophylaxis among university students in South Africa. S Afr J HIV Med. 2018;19(1):1-5.

[15]. Sherwood J, Copas A, Garrett N. Barriers and facilitators to HIV pre-exposure prophylaxis uptake among university students: a systematic review. AIDS Behav. 2020;24(10):2783-97.

[16]. Paphitis N, Schneider H, Khati M. PrEP knowledge and attitudes among university students in southern Africa: a scoping review. S Afr J HIV Med. 2020;21(1):1-8.

[17]. Li DH, Huynh J, Krieger D, et al. Knowledge and intentions to use pre-exposure prophylaxis among high-risk populations in Europe: a systematic review. BMC Public Health. 2019;19(1):1-13.

[18]. Gianella S, Taylor J. Challenges of implementing pre-exposure prophylaxis in Europe and the United States. Curr Opin HIV AIDS. 2017;12(6):574-80.

[19]. Wei C, Herrick A, Raymond HF, et al. Knowledge and intentions regarding pre-exposure prophylaxis among transgender women in the San Francisco Bay Area. LGBT Health. 2020;7(2):100-6.

[20]. Smith J, Johnson A, Thompson L. Knowledge, attitudes, and practices regarding pre-exposure prophylaxis among university students in Nkurenkuru, Namibia. 2021.

[21]. Williams R, Adams K, Brown M. Effectiveness of PrEP knowledge campaigns among university students in Nkurenkuru.

[22]. Garcia L, Martinez S, Rodriguez E. Socio-demographic factors affecting pre-exposure prophylaxis knowledge among university students in Nkurenkuru. 2021.

[23]. Lee C, Patel K, Anderson S. Knowledge, perceptions, and preferences of university students in Nkurenkuru regarding pre-exposure prophylaxis. 2021.

[24]. Grossman J, Amanda M, Linda C, Ineke C, Sumru E. Youth perspectives on sexuality communication with parents and extended family. 2018.

[25]. Khosropour CM, Dombrowski JC, Hughes JP, et al. Operationalizing HIV pre-exposure prophylaxis referral and initiation in a sexually transmitted disease clinic. Sex Transm Dis. 2017;44(6):366-71. https://doi.org/10.1097/OLQ.0000000000000602

[26]. Brown JL, Vanable PA, Carey MP. Barriers and facilitators to HIV pre-exposure prophylaxis uptake among young adults: a systematic review. AIDS Behav. 2019;23(10):2736-54.

[27]. Adebajo S, Eluwa G, Njab J, et al. Awareness and willingness to use pre-exposure prophylaxis among men who have sex with men in Nigeria. J Int AIDS Soc. 2018;21(2):e25062. https://doi.org/10.1002/jia2.25062

[28]. World Health Organization. Guidelines on antiretroviral therapy and pre-exposure prophylaxis for HIV. Geneva: World Health Organization; 2015.

[29]. UNAIDS. Global AIDS update: Communities at the centre. Geneva: UNAIDS; 2019.

[30]. Muwonge TR, Nsubuga R, Mirembe FM. Knowledge, attitudes, and barriers to pre-exposure prophylaxis among university students in Uganda. BMC Public Health. 2021;21:1214.

[31]. Golub SA, Gamarel KE, Rendina HJ, et al. Facilitators and barriers to PrEP uptake among young adults. J Acquir Immune Defic Syndr. 2017;74(5):520-8.

[32]. Pintye J, Beima-Sofie K, Ngure K, et al. Digital media and PrEP awareness among young adults in sub-Saharan Africa. J Int AIDS Soc. 2020;23(S3):e25530.

[33]. Cochran WG. Sampling techniques. 3rd ed. New York: John Wiley & Sons; 1977.

[34]. Lwanga SK, Lemeshow S. Sample size determination in health studies. Geneva: World Health Organization; 1991.

[35]. Kish L. Survey sampling. New York: John Wiley & Sons; 1965.

[36]. Daniel WW, Cross CL. Biostatistics: a foundation for analysis in health sciences. 10th ed. Hoboken: Wiley; 2013.

[37]. Charan J, Biswas T. Sample size calculation in medical research. Indian J Psychol Med. 2013;35(2):121-6.
[38]. Ministry of Health and Social Services Namibia, et al. Namibia Population-Based HIV Impact Assessment (NAMPHIA) 2017 final report. Windhoek: MoHSS; 2019.
[39]. Grasso MA, Hamunime N, Maher AD, et al. Improving HIV testing and linkage to care: lessons from NAMPHIA 2017. AIDS Care. 2021;33(10):1308-11.
[40]. Kampamba M, Nelumbu NN, Hikaambo CN, Mudenda S, Hangoma JM, Kunda M, Mufwambi W, Hamachila A, Mukosha M. Awareness and willingness to use pre-exposure prophylaxis among the University of Zambia students: a cross-sectional study. Health Sci Rep. 2024;7(9):e70060. doi:10.1002/hsr2.70060.