

AWARENESS AND UPTAKE OF HIV PRE-EXPOSURE PROPHYLAXIS (PREP) AMONG COLLEGE STUDENTS IN OR TAMBO DISTRICT, SOUTH AFRICA: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction: Expanding access to oral HIV Pre-Exposure Prophylaxis (PrEP) among young people and college students remains critical for the prevention of HIV in South Africa. This study assessed awareness and uptake of PrEP among college students in the OR Tambo district. **Method:** A quantitative cross-sectional design was employed. Data were collected through structured, self-administered questionnaires distributed to 155 students who met the inclusion criteria (n=155). **Results:** All 155 respondents (100%) reported awareness of PrEP. The majority were female (60%) and aged 20–25 years (84.5%), with a mean age of 22.14 years (SD ±4.48). The most commonly cited source of information was health promotion events on campus (41.9%). Interpersonal engagement was high, with 70.3% of students discussing PrEP with friends or partners. Additionally, 81.9% indicated that healthcare workers provide PrEP information during clinic visits. Despite this high awareness and engagement, uptake was low, with only 15.5% of respondents currently using PrEP. **Conclusion:** While awareness and attitudes toward PrEP are positive, uptake remains limited. Barriers include restricted access, preference for injectable PrEP, and gaps in risk perception. Targeted health education, improved accessibility, and youth-friendly services are needed to increase PrEP uptake and reduce HIV infections among young people.

Keywords: HIV prevention, Pre-Exposure Prophylaxis (PrEP), PrEP uptake, College students.

INTRODUCTION

Despite progress made in prevention, diagnosis and treatment, HIV persist as a major global public health challenge. It was globally estimated that in 2021, more than 38 million individuals were living with HIV, with around 1.5 million new infections reported during that year (UNAIDS, 2022). Although antiretroviral therapy (ART) coverage has expanded to over 28 million individuals, deaths and illnesses related to HIV remain substantial, particularly in the sub-Saharan region of Africa (World Health Organization, 2022). Women and adolescent girls remain excessively affected, responsible for a large proportion of new infections, highlighting persistent gender and structural inequalities in HIV vulnerability (UNAIDS, 2022).

South Africa remains the country most affected by the HIV epidemic across the globe, with a projected 8.2 million people infected with HIV and a national prevalence of 13.7% in 2021 (Statistics South Africa, 2021). Despite improvements in treatment access and programme expansion, new infections remain high, with approximately 240,000 recorded in 2018 alone. Young people, particularly those aged 15–25 years, continue to carry a disproportionate burden of infection, with young women experiencing a significantly higher incidence in comparison with males of the same age (Beesham et al., 2021).

The continued vulnerability of young individuals is linked to a combination of behavioural, societal, and structural drivers. Behaviours including early sexual introduction, relationships with older partners, multiple sexual partnerships, and unreliable use of condoms are key drivers of HIV risk among young people (Shamu et al., 2021). In addition, limited access to youth-friendly healthcare services, stigma associated with HIV prevention services, and reduced health-seeking behaviour further exacerbate vulnerability in this group (Ojikutu et al., 2018). Within this context, college students represent a particularly important subgroup due to their developmental stage, increased independence, and evolving sexual and social networks (Ajayi et al., 2019).

To address the global HIV burden, international frameworks have prioritised combination prevention strategies that aim to stop AIDS from being a threat to public health by 2030. These strategies include biomedical, behavioural, and condom distribution, voluntary male medical circumcision, sexual health education, and HIV-PrEP (Hillis et al., 2020). Among these, PrEP is recognised as a very effective biomedical intervention for HIV prevention in high-risk populations.

PrEP involves HIV-negative individuals taking antiretroviral medication to reduce their risk of acquiring HIV. When used consistently, oral PrEP can reduce the risk of infection by up to 99%, making it one of the most effective biomedical preventive tools currently available (South African National Department of Health, 2021).

Clinical evidence across multiple population clusters, comprising heterosexual adults and men who have sex with men, has demonstrated substantial reductions in HIV risk; however, effectiveness is closely linked to

adherence levels (Pyra et al., 2019). Among African women, success is variable due to challenges related to consistent use and adherence support (Van Vliet et al., 2019). This emphasizes the significance of continuity of care, including initiation, adherence, persistence, and reinitiation of PrEP services (Hojilla et al., 2021).

Despite strong evidence supporting its efficacy, the uptake of PrEP remains limited, particularly among young populations. Barriers such as low awareness, stigma, inconsistent access to services, concerns about side effects, and difficulties maintaining daily adherence continue to hinder optimal use (Eakle et al., 2018).

Although awareness about PrEP and willingness to use it have increased due to national scale-up initiatives and improved health communication strategies, this has not consistently translated into actual uptake (Sun et al., 2022). One of the key contributing factors is low perceived personal risk of HIV infection, where individuals underestimate their susceptibility despite engaging in high-risk behaviours (Sila et al., 2020). The discrepancy between understanding and action highlights the need for interventions that go beyond awareness to address behavioural and perceptual factors.

In South Africa, PrEP was introduced in 2016 as one of the national strategies to combat the spread of HIV; it was initially prioritised for key populations such as sex workers and men who have sex with men (Eakle et al., 2018). While implementation among these groups has shown progress, less attention has been given to college and university students, despite their position within a high-risk age category (Okeke et al., 2021). Consequently, limited evidence exists regarding their levels of awareness, attitudes, and actual use of PrEP, particularly in high-burden districts.

The OR Tambo District of the Eastern Cape Province experiences HIV prevalence rates that exceed the national average and is further affected by socioeconomic challenges, including poverty, unemployment, and limited healthcare infrastructure (Eastern Cape Socio-Economic Consultative Council, 2020). These contextual factors may further restrict young people from accessing services related to the prevention of HIV. Colleges in this district serve a large population of students aged 18–25 years, making them a critical setting for targeted HIV prevention interventions. Although campus-based health promotion programmes exist, their effectiveness in improving PrEP uptake remains uncertain.

Given the ongoing burden of HIV among young people and the limited empirical evidence on PrEP use in student populations, there is a clear need for context-specific research. Understanding levels of awareness, attitudes, and uptake of PrEP among college students is critical to identifying disconnects in the current prevention strategies and strengthening programme implementation.

Therefore, this study was conducted to evaluate the levels of awareness, attitudes, and uptake of pre-exposure prophylaxis (PrEP) among college students in the OR Tambo District, South Africa

METHODS

Study design

A quantitative cross-sectional study was conducted to assess awareness, attitudes, and uptake of pre-exposure prophylaxis (PrEP) among college students in the OR Tambo district. This design provided a snapshot of students' knowledge, behaviors, and engagement with HIV prevention strategies, enabling the identification of gaps in PrEP uptake and informing targeted interventions for this high-risk population.

Sample size

The required sample size was determined using Slovin's formula: $n = N / (1 + Ne^2)$, where $N = 640$ (total eligible students across four campuses) and $e = 0.07$ (margin of error). This calculation yielded approximately 155 students. To account for a 10% non-response rate, the adjusted sample size was estimated at 171 students. Ultimately, responses were obtained from 155 participants, meeting the minimum required sample size.

Study setting and population

The study was conducted among college students aged 18–25 years enrolled at four selected institutions in the OR Tambo district:

- Lilitha College of Nursing (Lusikisiki campus)
- Lilitha College of Nursing (Mthatha campus)
- Ingwe TVET College (Ngqungqushe campus)
- King Sabata Dalindyebo (KSD) College (Cicirha campus)

The study specifically targeted full-time students within this age range, as they represent the population most vulnerable to new HIV infections. This selection ensured that the findings would be relevant for understanding awareness, attitudes, and uptake of pre-exposure prophylaxis (PrEP) among young adults at elevated risk of HIV exposure.

Sampling method

Participants were selected using a convenience sampling approach, based on the availability of students who met the inclusion criteria across the four campuses. While this non-random method may introduce selection bias, it was chosen due to practical constraints, including limited resources, time, and the study population's accessibility.

Questionnaire description

Data collection was conducted through an online questionnaire distributed via students' social media platforms for participants to complete independently. Each participant was assigned a unique individual email address. The questionnaire consisted of items on socio-demographic characteristics, HIV testing history,

behaviours associated with HIV transmission, PrEP utilisation, knowledge of HIV infection, and experiences of HIV-related stigma. These items were designed to capture both factual knowledge and personal perceptions.

Development, Validity and Reliability

The questionnaire was developed by adapting items from previously validated HIV prevention and PrEP awareness tools used in similar studies in South Africa. To ensure content validity, questions were reviewed by subject matter experts in public health and HIV prevention. Reliability was enhanced by standardising definitions—for example, PrEP awareness was measured using the item “Before today, have you ever heard of PrEP?”, and uptake using “Have you ever used PrEP?” Prior to responding, participants received a brief explanation of PrEP to ensure consistent understanding. Knowledge was scored as correct (1) or incorrect (0).

Pilot Study

The questionnaire was piloted with a few students to assess the survey's clarity, appropriateness, and flow. Their feedback helped us make small improvements, such as simplifying wording and improving sequencing of items. The pilot confirmed that the instrument was feasible, acceptable, and capable of capturing relevant data on PrEP awareness, uptake, perceptions, and accessibility within college settings.

Ethics

Ethical clearance for the study was obtained from the Walter Sisulu University Ethics Committee (Approval Number: 005/2024). Administrative approval was additionally secured from the Eastern Cape Department of Health through the National Health Research Database. All participating colleges granted gatekeeper permission. Participants were provided with comprehensive information about the study, and confidentiality was strictly maintained. No personal identifiers were collected, and all data were anonymized and stored securely with password protection. Serial codes were used to link participant responses, ensuring data integrity while protecting participants' privacy.

Data analysis

Descriptive statistics (mean, median, frequencies, and standard deviation) were used to summarise demographic and behavioural characteristics. Measures of central tendency and dispersion were reported

RESULTS

Socio-demographic characteristics of respondents

Table 1 presents the socio-demographic profile of the 155 respondents who participated in the study. The analysis reveals a diverse distribution across both college campuses and age groups, providing important context for understanding the population's knowledge, attitudes, and behaviours related to HIV prevention and PrEP uptake.

Table 1: Socio-Demographic Characteristics (n=155)

Variables	N	%
College of Registration		
KSD FET Cicirha Campus	68	43.9
Lilitha College of Nursing Lusikisiki Campus	36	23.2
Ingwe FET Ngqungqushu Campus	32	20.6
Lilitha College of Nursing Mthatha Campus	19	12.3
Age Group		
18-19 years	24	15.5
20-25 years	131	84.5
Mean Age (Mean \pmSD)	22.14\pm4.48	

SD=Standard Deviation

Awareness of PrEP

Table 2 presents data on awareness of Pre-Exposure Prophylaxis (PrEP) among the 155 respondents. This information is critical in assessing the reach of HIV prevention messaging and the degree of exposure students have had to PrEP-related information through various channels.

Table 2: Awareness of PrEP (n=155)

Variables	N	%
Where did you hear about PrEP?		
Health promotion event on campus	65	41.9
Social media	25	16.1
In class	19	12.3
Friend/sex partner	11	7.1
Student health	10	6.5
Students organization	6	3.9
Advertisement (not social media)	3	1.9
Other	16	10.3
How long have you known about PrEP?		
Less than 3 months	23	14.8
3-6 months	40	25.8
6-12 months	23	14.8
1-2 years	35	22.6
More than 2 years	34	21.9

Engagement, Risk Perception, and Attitudes towards PrEP

Table 3 explores participants' interpersonal engagement with PrEP-related topics, their perceptions of HIV risk, and their attitudes toward PrEP as a preventive intervention. These dimensions provide important insights into both social dynamics and personal health decision-making that may influence PrEP uptake and adherence.

Table 3: Engagement, Risk Perception, and Attitudes towards PrEP (n=155)

Variables	N	%
Have you ever had a discussion about PrEP with your friends or partners?		
Yes	109	70.3
No	46	29.7
How often do you visit the clinic?		
Monthly	36	23.2
Once in two months	32	20.6
Once in three months	30	19.4
Once in six months	22	14.2
Once a year	35	22.6
Do healthcare workers at the clinic talk about PrEP during your visits?		
Yes	127	81.9
No	28	18.1
Based on your behavior in the last 3 months, do you think you are at risk of HIV?		
Not at risk	117	75.5
A little bit at risk	30	19.4
Somewhat at risk	4	2.6
Very much at risk	4	2.6
Do you think PrEP can help reduce your chances of getting HIV?		
Yes	133	98.7
No	2	1.3
If not currently on PrEP, do you think taking PrEP may be a good idea?		
Yes	123	79.4
No	8	5.2
Not applicable (currently on PrEP)	24	15.5

Uptake, Preferences and accessibility of PrEP Services

Table 4 presents findings on the current use of PrEP, preferences for PrEP delivery methods, and access to PrEP-related services among the respondents. These variables are crucial for understanding both demand- and supply-side factors that affect the uptake and sustainability of PrEP use in the student population.

Table 4: Uptake, Preferences, and Accessibility of PrEP Services (n=155)

Variables	N	%
Are you currently on PrEP?		
Yes	24	15.5
No	131	84.5
Is any of your friends taking PrEP?		
Yes	60	38.7
No	95	61.3
Are you or would you take a pill once a day to protect yourself from HIV?		
Yes	101	65.2
No	6	3.9
Not sure	48	30.9
What method of PrEP would you or do you prefer to use?		
A pill once a day	53	34.2
Injection once a month	23	14.8
An injection once every two months	60	38.7
Not sure	19	12.3
Would you prefer getting PrEP from your school or getting it at the clinic?		
At my school	102	65.8
At the clinic	53	34.2
Are there health workers visiting your school for healthcare services?		
Yes	110	71
No	45	29

DISCUSSION

The participant distribution reflected campus enrolment sizes and varying accessibility. Nursing colleges had fewer eligible students due to smaller intakes and a high proportion of older, working students on study leave. In contrast, FET colleges had larger student intakes, but limited resources, such as poor internet access, hindered participation in the online survey. Similar structural and resource-related barriers to participation and access to services have been reported in South African educational settings (Ngumbela, 2020).

Most of the students who participated in the study were young adults, with a mean age of 22.14 years (SD = 4.48), reflecting the homogeneity common in tertiary and health education settings. The concentration of students in their early twenties is particularly relevant for HIV prevention, as this age group is at higher risk due to increased sexual activity and lower engagement with health services (Shamu et al., 2021).

Awareness of PrEP was universal (100%), which contrasts with other South African and global studies, in which awareness among youth typically ranges from 40–70% (Ajayi et al., 2018). Ajayi et al. (2018) emphasise the importance of empowering young people with comprehensive HIV prevention packages and accessing PrEP and PEP. The substantially higher awareness observed in this study may reflect intensified campus-based HIV prevention campaigns or potential response bias. However, evidence suggests that awareness alone does not necessarily translate into utilisation without supportive behavioural interventions (Sun et al., 2022).

Campus health promotion events on PrEP reached less than half of students, indicating gaps in current outreach strategies. Previous studies similarly show that uncoordinated or limited health promotion efforts often fail to effectively reach young people (Pillay et al., 2020). Coordinated efforts between educational institutions, healthcare providers, and stakeholders, supported by structured planning and integration into institutional programmes, have been shown to improve engagement and adoption of safe sexual practices (Cowan et al., 2021).

Respondents reported a fairly even distribution in the length of time they had known about PrEP, indicating sustained awareness within the population. At the same time, a notable proportion had only recently become aware of PrEP, suggesting that awareness-building efforts are ongoing and require continued reinforcement (Sun et al., 2022).

The findings suggest that peer groups, influence, and social engagement play a key role in PrEP uptake. Consistent with previous studies, young people who receive adequate information from healthcare providers and outreach programmes are more likely to initiate PrEP and to promote its use within their social networks (Ojikutu et al., 2018). This underscores the value of integrating provider-led education with peer-supported interventions to enhance PrEP adoption among young people.

Encouragingly, healthcare workers are discussing PrEP during most youth clinic visits, suggesting the important role of provider-driven communication in improving awareness and uptake. However, the remaining 18.1% represents missed opportunities for risk assessment and prevention counselling. Previous studies similarly identify healthcare provider recommendation as a key determinant of PrEP uptake, with inconsistent engagement limiting utilisation (Venter, 2018).

Despite high awareness and positive attitudes toward PrEP, uptake was low, largely because 75.5% of participants perceived themselves as not at risk of HIV. In the South African context, where early sex introduction, relationships with older partners, multiple partners, and low condom use contribute to high HIV incidence (Shamu et al., 2021), this underestimation of personal risk is concerning. Low perceived susceptibility has been consistently associated with reduced engagement in preventive behaviours such as PrEP use (Sila et al., 2020).

Although awareness was universal in this study, utilisation remained low, echoing findings from Sun et al. (2022) who noted that knowledge does not guarantee behavioural uptake without targeted education, improved risk perception, and supportive health services. Despite participants' positive attitudes toward PrEP's effectiveness, uptake remained low, highlighting a gap between knowledge and behaviour. Studies by Sun et al. (2022) and Pyra et al. (2019) found that stigma, fear of adverse effects, poor counselling, and low risk perception hinder PrEP use, even when awareness is high. Peer influence may play an important role in addressing this gap, suggesting that peer-led interventions, alongside strengthened provider engagement, are essential to improve PrEP uptake among students.

The findings show a high willingness to use PrEP, reflecting a generally favourable attitude toward daily oral prophylaxis. However, some participants remained uncertain, highlighting gaps in communication with healthcare providers and the need for targeted counselling. Previous studies similarly report that inadequate provider engagement and limited personalised risk communication contribute to uncertainty and low uptake among young people (Okeke et al., 2021).

The results suggest that among young people, there is a strong preference for long-acting injectable PrEP, reflecting its convenience and reduced need for daily adherence. Previous studies similarly indicate that offering multiple PrEP delivery options, including injectable formulations, improves acceptability and uptake, particularly among young people concerned about adherence and limited access to services (Van Vliet et al., 2019). Expanding PrEP delivery modalities beyond oral formulations could therefore enhance coverage and programme effectiveness.

Integrating PrEP services into school-based health services could improve accessibility and reduce structural barriers, including travel time, stigma at public clinics, and inconsistent service availability. Evidence suggests that decentralised and youth-friendly service delivery models, including school-based and community outreach

services, significantly improve uptake and adherence (Pillay et al., 2020). Enrolling students in differentiated service delivery models such as CCMDD may further enhance continuity of care and medication access (South African National Department of Health, 2021). Additionally, leveraging existing campus outreach services aligns with global recommendations for integrated, client-centred HIV prevention approaches (WHO, 2022).

Overall, the findings in this study suggest that multiple interrelated factors influence PrEP uptake among students. While awareness was high, low risk perception, inconsistent provider engagement, and structural barriers limited uptake. Peer influence emerged as a potential facilitator of adoption, while preferences for long-acting PrEP highlight the importance of delivery options that address adherence challenges. Addressing these factors through targeted, youth-friendly, and integrated interventions is essential for improving PrEP utilisation among young people.

Implications for practice

The results from this study underscore numerous practical implications for efforts to improve PrEP awareness and uptake. Youth-focused services are pivotal in curbing HIV transmission and promoting healthy behaviours. Therefore, targeted health education initiatives should prioritize comprehensive, age-appropriate, and culturally sensitive information on HIV prevention, PrEP, and risk identification. Such educational interventions may improve knowledge and empower young people to make informed decisions regarding HIV prevention strategies (Sun et al., 2022).

Improving accessibility to PrEP services is also essential. Providing services in youth-friendly, non-stigmatizing environments, such as schools, colleges, and community centers, may enhance uptake (South African National Department of Health, 2021). Additionally, peer-led interventions can be particularly effective, as social influence and peer networks significantly shape health behaviours among young people (Ojikutu et al., 2018). Leveraging peer educators may therefore strengthen PrEP awareness and acceptance.

Addressing structural barriers is equally important. Factors such as transportation costs, service availability, and healthcare provider biases may limit access to PrEP services (Pillay et al., 2020). Healthcare providers should receive training to deliver youth-friendly, non-judgmental care that encourages engagement and adherence (Cowan et al., 2021). Furthermore, innovative delivery methods, including long-acting injectable PrEP and alternative service platforms, may align with young people's preferences and improve convenience (Van Vliet et al., 2019). Strengthening partnerships among health providers, schools, and community groups is also necessary to expand outreach efforts and ensure sustained support for young people (South African National Department of Health, 2021).

Limitations

This study is subject to some limitations that should be acknowledged when interpreting the results. The use of a self-administered online questionnaire required participants to have access to smartphones, email addresses, and internet connectivity. This requirement may have excluded students without access to these resources, potentially affecting participation and representation, particularly in resource-limited settings where digital access remains uneven (World Health Organization, 2021).

The study focused on students from selected colleges within the OR Tambo District; as a result, the findings may not be fully generalisable to other student populations across South Africa (Polit & Beck, 2021). Third, the use of convenience sampling and an online survey may have introduced biases, including self-selection and social desirability, which could influence participants' responses (Etikan, 2018; Fisher, 1993).

Additionally, the scope of the study was limited to assessing awareness and uptake of PrEP among college students. It did not explore other influential factors such as healthcare provider perspectives, institutional support, or broader community-level influences. PrEP is a globally recommended HIV prevention intervention (World Health Organization, 2019; UNAIDS, 2023), and understanding its uptake requires a multi-level approach beyond individual awareness alone.

Finally, the cross-sectional study design provides a snapshot of the situation at a specific point in time. It does not allow for causal inferences or assessment of changes over time (Setia, 2016). These limitations highlight the need for further research to provide a more comprehensive understanding of PrEP awareness and uptake among college students in South Africa.

CONCLUSION

This study demonstrates high awareness (100%) but low uptake (15.5%) of PrEP among college students in the OR Tambo district, South Africa. While attitudes toward PrEP were generally positive, barriers such as limited access, preference for long-acting injectable formulations, and low risk perception appear to hinder uptake. The findings highlight the importance of targeted health education, improved accessibility, and supportive youth-focused services to help bridge the gap between awareness and use, without overstating implications beyond the study population.

Recommendations

Drawing on the study's findings, several recommendations are advanced for PrEP awareness, uptake, and adherence among young people. Strengthening collaboration between health workers, schools, and community groups is essential to enhance outreach and support services. In addition, comprehensive, age-appropriate health education programs focusing on HIV prevention, PrEP, and risk identification should be developed and implemented across educational settings.

Delivering PrEP through youth-friendly environments such as schools, colleges, and community hubs may improve accessibility and uptake. Peer-led interventions should also be encouraged to leverage social influence and promote positive health behaviors among young people. Furthermore, healthcare providers should receive training to deliver non-judgmental, youth-friendly services that encourage engagement and adherence.

Alternative delivery approaches, such as injectable PrEP and online services, should be considered to meet the preferences and needs of young people. Addressing structural barriers, including cost, transportation, and provider-related challenges, is also critical. Enrolling PrEP clients in the CCMDD (Central Chronic Medication Dispensing and Distribution) program may improve adherence and continuity of care. Additionally, regular outreach programs in which healthcare workers visit schools and colleges should be implemented to raise awareness and provide accessible services.

These recommendations may contribute to improve PrEP awareness, uptake, and adherence among young people in South Africa and ultimately support efforts to reduce new HIV infections.

Conflicts of Interest

O.O. and A.A.A.A. are members of the Editorial Board. They were not involved in the editorial handling, peer review, or publication decision for this manuscript. The remaining authors declare no competing interests.

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