

# Knowledge, attitudes, and perceptions of MSM Towards ED-PrEP across five districts in South Africa

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## ABSTRACT

### Introduction

Men who have sex with men (MSM) are at higher risk of contracting HIV. Consensual anal sex (CAS) is the highest-risk sexual act for HIV transmission. All conceivable HIV prevention options ought to be made available, coupled with demand creation strategies intended to enhance the adoption and use of these interventions, to reduce HIV transmission among MSM. A unique and scientifically supported approach to overcoming obstacles to MSM adoption of current HIV prevention strategies (daily PrEP, male circumcision, condom use) is event-driven PrEP (ED-PrEP).

### Purpose

This study investigates the knowledge, attitudes, and perceptions (KAP) of MSM towards event-driven PrEP (ED-PrEP) and explores relationships between socio-demographic characteristics, sexual risk profiles, and willingness to use ED-PrEP across five districts in South Africa.

### Methods

A cross-sectional study was conducted with 295 MSM participants recruited from drop-in clinics across five districts in South Africa between April and June 2023. A structured online questionnaire assessed demographic information, HIV risk behaviours, and KAP regarding ED-PrEP. Descriptive statistics were calculated, and logistic regression analyses were performed to identify predictors of knowledge and attitudes towards ED-PrEP. Statistical significance was set at  $p < 0.05$ .

### Results

The study found that 71.9% of participants had good knowledge of ED-PrEP, while 58% expressed a positive attitude towards its use. Logistic regression analysis revealed that sexual orientation (OR = 2.5,  $p = 0.03$ ), perceived risk of acquiring HIV (OR = 3.8,  $p < 0.001$ ), and education level (OR = 2.2,  $p = 0.002$ ) were significant predictors of willingness to recommend ED-PrEP.

### Conclusion

The findings highlight a high level of awareness and willingness to use ED-PrEP among MSM, particularly in urban districts. Targeted public health campaigns are recommended to enhance understanding and acceptance of ED-PrEP by addressing misconceptions and providing tailored information to improve uptake and adherence, ultimately contributing to HIV epidemic control.

## INTRODUCTION

HIV epidemic control hinges on how well key populations (KP) are included in the national response to the epidemic. Key populations comprise sex workers (SW), prisoners, people who inject drugs (PWID), and men who have sex with men (MSM). This study focused on MSM. The prevalence of HIV among MSM is as high as 38.5% (Lane et al., 2011); these men are up to 13 times more likely to acquire HIV. Modelling shows that KP will contribute up to 40% of new infections in the next five years (Stone et al., 2021).

Several prevention modalities are available to MSM, including condom use, taking PrEP, and voluntary medical male circumcision (VMMC). Oral pre-exposure prophylaxis (PrEP) with tenofovir disoproxil fumarate and emtricitabine (Truvada®) as active ingredients is an effective prevention modality against HIV infection (Fonner et al., 2016). Two modalities of PrEP have been evaluated in randomised clinical trials and are currently included in international guidelines: PrEP is taken either daily (every 24 hours) or as event-driven PrEP (ED-PrEP), where medication is taken before and after sexual contact (European AIDS Clinical Society [EACS], 2018).

Adherence to daily PrEP is low, with a high percentage of MSM dropping out of PrEP programmes. MSM across PrEP programmes in South Africa cycle on and off PrEP (Pienaar, 2022). The reasons hypothesised for this include the daily pill burden and changes in risk status. However, MSM who underestimate their risks and cycle off PrEP remain at significant risk of acquiring HIV.

The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have endorsed the use of event-driven PrEP, meaning that PrEP can be taken using an evidence-based and safe regimen comprising two PrEP tablets taken two to 24 hours before sex, and one pill 24 hours thereafter for two days. This means that the client takes four PrEP tablets over three days, following the regimen referred to as 2+1+1 (WHO, 2019).

South Africa has not yet rolled out ED-PrEP among MSM due to limited research or information about how MSM understand the regimen and their acceptability of it. Optimising HIV pre-exposure prophylaxis (PrEP) provision requires insight into MSM's preferences for PrEP

regimens and why they would stop taking PrEP. As ED-PrEP is a new modality in South Africa, the Department of Health must have a thorough understanding of MSM knowledge of ED-PrEP, their perceptions, and beliefs about this modality, which would inform its advocacy, communication, and social mobilisation (ACSM) approach, and how to relay information about the regimen to MSM.

Conversely, there is a notable gap in the literature regarding the knowledge, attitudes, and perceptions (KAP) of MSM towards ED-PrEP, particularly in the South African context. Existing research has primarily focused on daily PrEP regimens, neglecting the specific needs and concerns of MSM regarding ED-PrEP. While some studies have explored general attitudes towards PrEP among MSM, there is limited understanding of how these attitudes translate to acceptance and willingness to use ED-PrEP. Furthermore, the influence of socio-demographic factors, such as age, education level, and sexual orientation, on KAP towards ED-PrEP has not been adequately addressed.

Given these gaps in the literature, this study aims to investigate the KAP of MSM towards ED-PrEP across five districts in South Africa. By focusing on this specific population and the unique context of ED-PrEP, the research seeks to provide valuable insights that can inform public health strategies and interventions. Understanding the KAP of MSM is crucial for developing targeted educational campaigns and improving access to ED-PrEP services, ultimately contributing to enhanced HIV prevention efforts.

In summary, while there is a growing body of research on PrEP, the specific KAP of MSM towards ED-PrEP remains underexplored. This study addresses this critical gap by examining the relationships between socio-demographic characteristics, sexual risk profiles, and willingness to use ED-PrEP among MSM in South Africa. The findings will have important implications for public health initiatives aimed at reducing HIV transmission rates in this vulnerable population.

## METHODS

### *Study Design*

This study utilized a prospective descriptive cross-sectional design to explore the knowledge, attitudes, and perceptions

(KAP) of men who have sex with men (MSM) towards event-driven PrEP (ED-PrEP) across five districts in South Africa. This design was selected to capture a comprehensive snapshot of MSM's views and behaviours regarding ED-PrEP.

### Population

Participants were recruited from five sites across South Africa operated by the Aurum Institute. These sites are dedicated drop-in facilities for MSM and transgender women (TGW), providing HIV testing, prevention, and treatment services following a status-neutral model. The target population consisted of MSM who frequented drop-in clinics operated by the Aurum Institute in five districts: eThekweni and uMgungundlovu (KwaZulu-Natal), Tshwane and Ekurhuleni (Gauteng), and Ehlanzeni (Mpumalanga). These clinics specifically cater to MSM and TGW.

### Sample Size and Sampling Method

The sample size was determined based on an estimated MSM population eligible for PrEP, with a 95% confidence level, a 5% margin of error, and an expected response frequency of 50%. The estimated sample size was 341 MSM; however, the study ultimately enrolled 295 participants. Participants were recruited through convenience sampling at the drop-in clinics and via online platforms.

### Data Collection

Data were collected using a structured questionnaire that included KAP scale items derived from previously validated PrEP scales, along with a self-risk assessment component. The final instrument comprised 68 items divided into eight sections, covering demographic information, HIV risk behaviours, knowledge and attitudes towards ED-PrEP, barriers to ED-PrEP uptake, and willingness to recommend ED-PrEP. The survey was administered online using electronic tablets at the enrolment sites and shared via online links with existing PrEP clients through listservs maintained by the Aurum Institute. This process ensured that site staff could not access or view the collected data.

### Variables

Key variables measured in the study included:

- **Independent variables:** Age, relationship status, employment, level of education, sexual orientation, perceived risk of acquiring HIV.
- **Dependent variables:** Knowledge of ED-PrEP, attitudes towards ED-PrEP, willingness to use and recommend ED-PrEP.

### Statistical Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) Version 29.0 (2023). Descriptive statistics were calculated for demographic variables, while inferential statistics, including chi-square tests and logistic regression analyses, were performed to identify significant predictors of knowledge and attitudes towards ED-PrEP. All inferential tests were two-tailed and conducted at the 95% confidence level.

### Ethical Considerations

The study protocol was approved by the Institutional Review Board (IRB) of the University of Johannesburg. Informed consent was obtained from all participants prior to data collection, ensuring that they understood the study's purpose and their right to withdraw at any time. Participant confidentiality was maintained by anonymising responses and securely storing the data.

## RESULTS

The study enrolled 295 participants across five districts in South Africa between April and 12 June 2023. **Table 1** shows that the median age was 26 years, with a mean of 27 years. Of the 295 participants, 94% were classified as Black, 36.6% reported having sex mainly with male partners, 64.4% had completed high school or obtained a diploma, and 55.6% were of lower socioeconomic status (SES), indicating a monthly income of R0 to R1000.

Table 1:  
Descriptive statistics of the demographics of enrolled participants

Variable	Category	N	Total % by category
Age Category	18–24	132	44.7%
	25–34	124	42.0%
	>35	39	13.2%
Race/Ethnicity	Black	278	94.2%
	Indian	4	1.4%
	Coloured	7	2.4%
	White	6	2.0%
	Other	0	0.0%

Variable	Category	N	Total % by category
Sexual Orientation (who do you have sex with?)	Exclusively Male	87	29.5%
	Mainly Male	108	36.6%
	Both Male and Female	49	16.6%
	Mainly Female	38	12.9%
	Prefer not to say	13	4.4%
	Other	0	0.0%
Education level	Not completed high school	29	9.8%
	High school or diploma equivalent	190	64.4%
	Some college or technical degree	35	11.9%
	University	35	11.9%
Average monthly income (per month)	R0-R1000	164	55.6%
	R1001-R2500	33	11.2%
	R2501-R5000	41	13.9%
	R5001-R10 000	21	7.1%
	R10 000-R50 000	31	10.5%

Of the 295 respondents, 91.9% (271) had heard of PrEP. Age, sexual orientation, level of education, and race demonstrated no significant association with knowledge about ED-PrEP. However, the district where participants were recruited was significantly associated with knowledge of ED-PrEP ( $\chi^2 = 27.475$ ,  $df = 8$ ,  $p < 0.001$ ), with participants from eThekweni and Ekurhuleni demonstrating a higher than expected level of knowledge.

Responses from the KAP survey section on attitudes and perceptions were scored and categorised as positive, negative, or neutral to form a matrix of scoring for attitudes and perceptions. Descriptive statistics and frequency analyses were conducted for these categories to assess trends across the sample. Table 2 shows that respondents expressed positive feelings towards ED-PrEP: 58% (171), with no negative responses recorded.

**Table 2:**  
Frequency statistics of MSM attitudes on ED-PrEP

Attitude Category	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Negative	4	1.4%	1.4%	1.4%
Neutral	120	40.7%	40.7%	42.0%
Positive	171	58.0%	58.0%	100.0%
<b>Total</b>	<b>295</b>	<b>100.0%</b>	<b>100.0%</b>	

Attitude Category	Frequency	Percentage	Valid Percentage	Cumulative Percentage
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**Table 3** shows the distribution of attitude on ED-PrEP scores across the demographic variables of participants. Respondents who completed high school and those residing in Ekurhuleni demonstrated the highest rates of positive responses towards ED-PrEP at 71.3% and 50.9%, respectively; both were significant at  $p < 0.001$ . Similarly, participants who reported having sex exclusively or mainly with male partners demonstrated a collective positive attitude of 74.3%, which was significant at  $p < 0.01$ . Participants generally felt that people who take ED-PrEP are responsible (69.8%), and 40.2% strongly disagreed with the statement that taking ED-PrEP would result in more HIV sero-conversions due to regimen confusion.

**Table 3:**  
Distribution of attitude on ED-PrEP scores across demographic variables

Demographic Variable	Negative Count (Column %)	Neutral Count (Column %)	Positive Count (Column %)
<b>District</b>			
Ehlanzeni	4 (100.0%)	25 (20.8%)	31 (18.1%)
Ekurhuleni	0 (0.0%)	35 (29.2%)	87 (50.9%)
eThekweni	0 (0.0%)	34 (28.3%)	21 (12.3%)
Tshwane	0 (0.0%)	10 (8.3%)	7 (4.1%)
uMgungundlovu	0 (0.0%)	16 (13.3%)	25 (14.6%)
<b>Age Category</b>			
18-24	3 (75.0%)	56 (46.7%)	73 (42.7%)
25-34	0 (0.0%)	51 (42.5%)	73 (42.7%)
>35	1 (25.0%)	13 (10.8%)	25 (14.6%)
<b>Race/Ethnicity</b>			
Black	4 (100.0%)	111 (92.5%)	163 (95.3%)
Indian	0 (0.0%)	2 (1.7%)	2 (1.2%)
Coloured	0 (0.0%)	3 (2.5%)	4 (2.3%)
White	0 (0.0%)	4 (3.3%)	2 (1.2%)
<b>Sexual Orientation</b>			
Exclusively Male	2 (50.0%)	23 (19.2%)	62 (36.3%)
Mainly Male	0 (0.0%)	43 (35.8%)	65 (38.0%)
Both Male and Female	1 (25.0%)	27 (22.5%)	21 (12.3%)
Mainly Female	0 (0.0%)	21 (17.5%)	17 (9.9%)
Prefer not to say	1 (25.0%)	6 (5.0%)	6 (3.5%)
<b>Education level</b>			
Not completed high school	0 (0.0%)	15 (12.5%)	14 (8.2%)
High school or diploma	0 (0.0%)	68 (56.7%)	122 (71.3%)

Demographic Variable	Negative Count (Column %)	Neutral Count (Column %)	Positive Count (Column %)
Some college or technical University	0 (0.0%)	21 (17.5%)	14 (8.2%)
Average monthly income			
R0-R1000	2 (50.0%)	59 (49.2%)	103 (60.2%)
R1001-R2 500	1 (25.0%)	15 (12.5%)	17 (9.9%)
R2501-R5000	0 (0.0%)	19 (15.8%)	22 (12.9%)
R5001-R10 000	1 (25.0%)	11 (9.2%)	9 (5.3%)
R10 000-R50 000	0 (0.0%)	13 (10.8%)	18 (10.5%)

Participants were asked to rate their risk of HIV acquisition from no risk to high risk; 48.5% rated themselves as low risk despite 6% having tested positive for an STI in the last 12 months and 23% reporting “almost always” engaging in condomless anal sex within the last 3 months. However, there was no association between participants’ self-risk assessment and their attitudes towards ED-PrEP ( $p > 0.05$ ). Similarly, participants currently using PrEP (67.1%) reported that they were highly likely to recommend ED-PrEP, revealing a significant association between current PrEP use and attitudes towards ED-PrEP ( $p < 0.05$ ).

Regarding sexual orientation and the likelihood of recommending ED-PrEP, a statistically significant association was found ( $p = 0.007$ ). Participants who had sex exclusively or mainly with male partners were highly likely to recommend ED-PrEP to others.

A logistic regression was conducted to determine whether socio-demographic variables predicted the likelihood of recommending ED-PrEP. **Table 4** depicts likelihood ratio tests for predictor variables.

**Table 4:** Likelihood ratio tests for predictor variables against likelihood to recommend ED-PrEP

Effect	Model Fitting Criteria	Likelihood Tests	Ratio
	-2 Log Likelihood of Reduced Model	Chi-Square	
Intercept	17.119a	.000	
Race/Ethnicity	21.650	4.531	
Sexual Orientation	32.299b	15.180	
Education level	38.568b	21.449	
Average Income per month	62.621b	45.502	
District Category	327.475b	310.356	

Effect	Model Fitting Criteria	Likelihood Tests	Ratio
Age Category	24.038b	6.919	

Average monthly income, education level, and district of residence were strong predictors of participants’ likelihood to recommend ED-PrEP, as indicated by significant likelihood ratio tests ( $p < 0.05$ ).

## DISCUSSION

The results of this study provide critical insight into ED-PrEP as a biomedical intervention for MSM and their knowledge and acceptability of this regimen. The data from this study emphasise that knowledge of and understanding of the ED-PrEP regimen is high among MSM in South Africa.

A substantial portion of participants demonstrated a commendable level of knowledge about ED-PrEP. Specifically, 71.9% of the participants displayed a good level of knowledge, while 24.1% had a fair understanding, and only 4.1% exhibited poor knowledge. This outcome is consistent with a prior study conducted by [Nakiganda et al. \(2022\)](#) in Uganda, who also found a high level of awareness among MSM regarding ED-PrEP. Therefore, the study’s findings confirm that MSM in South Africa are highly aware of ED-PrEP, reflecting a positive trend in knowledge about this regimen. This finding is encouraging, as it suggests that educational efforts regarding ED-PrEP have been somewhat effective. However, the remaining 28.1% of participants who exhibited lower knowledge levels highlight a critical gap that warrants further investigation. Understanding the characteristics of these individuals—such as their socio-demographic backgrounds, access to information, and potential barriers to learning—could inform targeted educational interventions.

In terms of sexual orientation, participants who primarily had male sexual partners displayed a good level of ED-PrEP knowledge. This aligns with [Voligno et al.’s \(2020\)](#) findings that men who identify as gay or have sex exclusively with other men generally have a moderate understanding of ED-PrEP. However, no significant association was found between participants’ sexual orientation and their ED-PrEP knowledge. Similarly, no significant association was observed between participants’ education level and their ED-PrEP knowledge.

However, the district of residence revealed a statistically significant association with ED-PrEP knowledge. Participants in the eThekweni and Ekurhuleni districts displayed higher-than-expected levels of good ED-PrEP knowledge, whereas the Tshwane district had the lowest proportion of participants with good knowledge. This finding underscores the potential influence of geographic factors on ED-PrEP awareness within South Africa. Although eThekweni, Ekurhuleni, and Tshwane are all metropolitan districts, only two of these demonstrated good knowledge. This result could potentially be confounded by a large contingent of respondents residing in outlying areas of Tshwane such as Shoshanguve and Ga-Rankuwa. Nyirenda et al. (2018) revealed that these areas are peri-urban/semi-rural and that information access and health-seeking behaviours are negatively correlated with these settings.

The marked correlation between one's district of residence and knowledge of ED-PrEP underscores the critical need to tackle regional disparities in healthcare awareness and accessibility. Public health initiatives must be geared towards closing these gaps, ensuring that every eligible man has equitable access to vital information and resources concerning ED-PrEP. Given the distinct variations observed across districts, this valuable insight can guide public health authorities in crafting tailored educational campaigns aimed at regions where knowledge levels about ED-PrEP are comparatively lower, thereby enhancing overall awareness and understanding of the regimen. This finding emphasises the importance of addressing regional disparities in healthcare access and information dissemination. Public health initiatives must be designed to ensure equitable access to information and resources, particularly in peri-urban and rural areas where knowledge gaps may be more pronounced.

The data also reveal that 58% of participants held a positive attitude towards ED-PrEP, while 40.7% maintained neutral attitudes, and only 1.4% expressed negative attitudes. This distribution suggests a generally favourable perception of ED-PrEP among MSM, which aligns with findings from Coulaud et al. (2018) indicating a growing interest in PrEP among key populations. However, the relatively high percentage of neutral attitudes indicates potential

ambivalence that could be addressed through further education and outreach.

Regarding race/ethnicity, it was observed that most participants who identified as Black displayed positive attitudes towards ED-PrEP, while individuals in the Indian category showed the lowest proportion of positive attitudes. However, the analysis did not reveal a statistically significant association between participants' race/ethnicity and their attitudes towards ED-PrEP.

A statistically significant association was found between participants' sexual orientation and attitudes towards ED-PrEP. Respondents who reported having sex with "mainly male sexual partners" demonstrated a higher proportion (22%) of positive attitudes towards ED-PrEP, while only two respondents (2.3%) expressed negative attitudes. These results contrast with findings by Coulaud et al. (2018), who found that MSM in West Africa who were more sexually attracted to women than men showed significantly lower interest in taking PrEP compared to MSM who were mostly or exclusively attracted to men. This difference in the South African context may be attributed to the ability of MSM to openly identify as gay or bisexual without legal consequences—an important structural enabler for accessing healthcare services and improving understanding and attitudes towards PrEP.

Participants who had "completed high school or a diploma" displayed predominantly neutral attitudes towards ED-PrEP, with a lower-than-expected level of positive attitudes in this group. Conversely, those with college or university degrees reported higher levels of positive attitudes. This resulted in a statistically significant association between education level and attitudes towards ED-PrEP. The difference in attitudes—where respondents with higher education reported more positive responses—could be attributed to increased access to information and exposure to PrEP-related education. This is supported by the fact that all university and college campuses across the participating districts provide PrEP through the Higher Education and Training HIV & AIDS Programme (HEAIDS) and the Aurum Institute.

Interestingly, the study did not find significant associations between self-perceived risk and attitudes towards ED-PrEP. This finding is consistent with Plotzker et al. (2017),

who also did not identify self-risk assessment as a predictor of PrEP acceptance. This may suggest that MSM in South Africa are increasingly recognising the value of preventive measures like ED-PrEP, irrespective of their perceived personal risk. Such a shift in perception could be harnessed in public health campaigns to promote ED-PrEP as a proactive rather than reactive health choice.

A statistically significant association was found between respondents' perceived risk of acquiring HIV and their likelihood of recommending ED-PrEP. Participants who rated themselves as having low or low-to-medium risk of acquiring HIV reported a high likelihood of recommending ED-PrEP to others. This contradicts the findings of [Yi et al. \(2016\)](#), whose research revealed that a low perception of HIV risk was associated with a lower willingness to use PrEP. According to their study, individuals with low perceived risk were also less likely to recommend PrEP. The current findings suggest that MSM with low-risk perception in South Africa may still advocate for ED-PrEP use, possibly indicating a broader awareness of its preventive benefits.

When it comes to predicting the uptake of ED-PrEP and the likelihood of recommending it, neither self-risk perception nor socio-demographic variables proved to be consistent predictors. This contrasts with a study conducted by [Yi et al. \(2016\)](#), which found that knowledge, perceived benefits and barriers, perceived susceptibility to HIV, and positive attitudes towards PrEP were significant predictors of PrEP uptake. Notably, their study identified a favourable attitude as the strongest direct influence on the intention to use PrEP. However, the current study aligns more closely with findings by [Li et al. \(2025\)](#), who determined that younger age and higher educational attainment were significantly associated with greater intent to use PrEP.

This suggests that public health initiatives relying solely on traditional predictors may not effectively identify potential ED-PrEP users or advocates. While previous studies have established the relevance of knowledge, perceived benefits, and susceptibility, the present research highlights the nuanced and multifactorial nature of decision-making around ED-PrEP. As such, public health strategies should evolve to consider additional determinants and behavioural drivers of ED-PrEP uptake and promotion.

These strategies might include comprehensive education campaigns that highlight not only the clinical benefits but also the personal and social advantages of ED-PrEP.

The study's findings on the relationship between socio-demographic variables and attitudes towards ED-PrEP among MSM in South Africa have meaningful implications for public health strategy. It is evident that a one-size-fits-all approach to awareness may not be effective, given the variability of attitudes across subgroups within the MSM population. Therefore, targeted campaigns should be developed to address the specific beliefs, concerns, and informational needs of each subgroup. For example, given the diversity in educational attainment within the MSM community, public health authorities must ensure that communication about ED-PrEP is both accessible and accurate, addressing any misconceptions or myths that may vary depending on education level.

Moreover, the findings underscore the importance of tailoring interventions to local contexts. South Africa's diverse landscape necessitates adaptable public health efforts that consider the unique characteristics, challenges, and perceptions present in each district. By developing strategies that are responsive to the specific needs of local populations, health authorities can enhance the effectiveness of HIV prevention initiatives related to ED-PrEP.

Additionally, the study's findings regarding the relationship between sexual orientation and attitudes towards ED-PrEP offer a critical insight. This presents an opportunity for public health agencies to identify and engage subpopulations within the MSM community who may be at greater risk for HIV but hold less favourable views toward ED-PrEP. Targeted efforts should focus on bridging information gaps and addressing specific concerns within these groups to ensure they have both access to and acceptance of this preventive measure. By mitigating these challenges, public health strategies can improve the overall acceptance and utilisation of ED-PrEP among MSM in South Africa.

This study is the first to comprehensively assess the knowledge, attitudes, and perceptions (KAP) of MSM in South Africa towards event-driven PrEP. In seeking to bridge this knowledge gap, the findings provide a crucial

foundation for understanding the potential role of ED-PrEP within the broader context of HIV prevention for this key population. Importantly, the insights gained from the study could inform the development and revision of policies within South Africa's HIV prevention framework.

Identifying barriers in the KAP of MSM toward both daily PrEP and ED-PrEP is essential for designing effective interventions, including communication strategies aimed at promoting ED-PrEP uptake. This research went beyond simply assessing knowledge levels; it also sought to deepen understanding of the attitudinal and perceptual barriers that may hinder the adoption of this preventive approach. These insights can guide the strategic design and targeted implementation of information, education, and communication (IEC) models specifically tailored to enhance ED-PrEP awareness and use.

In conclusion, while this study provides valuable insights into the KAP of MSM regarding ED-PrEP, it also highlights key areas for further investigation. Addressing knowledge gaps, understanding variations in attitudes across socio-demographic groups, and ensuring equitable access to accurate information will be essential for improving ED-PrEP uptake. These efforts will ultimately contribute to more effective HIV prevention strategies and improved health outcomes for MSM in South Africa.

### Limitations

Although the findings of this study on the knowledge, attitudes, and perceptions (KAP) of men who have sex with men (MSM) towards event-driven PrEP (ED-PrEP) provide valuable insights, several limitations must be acknowledged. First, the study fell short of its intended sample size of 341 participants, enrolling only 295. This shortfall may have impacted the representativeness and generalisability of the findings, reducing statistical power and limiting the robustness of conclusions drawn.

The use of an online survey method introduces several methodological limitations:

- **Digital Divide:** Individuals without consistent internet access or adequate digital literacy may have been excluded from participation. This limits the generalisability of the findings to the broader MSM population, especially those in under-resourced areas (Evans & Mathur, 2018).

- **Self-Selection Bias:** Online surveys tend to attract individuals already interested in or familiar with the topic. In this case, MSM who already possess a positive attitude towards PrEP may have been more inclined to participate, potentially inflating the overall levels of knowledge and positive attitudes reported. Those who are unaware of or sceptical about ED-PrEP may be underrepresented.
- **Anonymity and Social Desirability Bias:** While online anonymity can encourage honesty, concerns over privacy and data security may have led participants to provide socially desirable responses, particularly on sensitive topics such as sexual behaviour and HIV prevention (Gnamb & Kaspar, 2015).
- **Limited Depth of Responses:** Online surveys generally rely on closed-ended questions, limiting the ability to capture nuanced perspectives. Qualitative methods, such as interviews or focus groups, would be valuable in complementing survey data to explore underlying beliefs, misconceptions, and contextual factors influencing ED-PrEP uptake (Braun & Clarke, 2013).
- **Technical Challenges:** Dependence on digital platforms may have introduced technical issues affecting participation and data completeness, further compounding the digital divide.
- **Selection Bias by Demographic:** Younger, more tech-savvy MSM may have been overrepresented, while older individuals or those less familiar with technology may have been underrepresented. This demographic skew could influence findings, as attitudes and awareness of ED-PrEP may vary across age groups (Jang & Vorderstrasse, 2019).
- **Geographic Bias:** The study's reliance on online recruitment methods may have resulted in an overrepresentation of participants from urban centres, with fewer participants from rural or peri-urban areas, where healthcare access and health information dissemination may differ significantly (Nyirenda et al., 2018).
- **Healthcare Engagement Bias:** MSM already engaged with healthcare services or previously exposed to PrEP-related messaging may have been more likely to participate. This limits the study's

ability to capture insights from MSM who are disengaged from health services or unaware of prevention options.

In summary, while online surveys provide an efficient means of data collection, their limitations—including the digital divide, self-selection bias, and lack of qualitative depth—must be considered. Future research should adopt mixed-methods approaches, combining quantitative surveys with qualitative interviews or focus groups, to gain a more comprehensive understanding of MSM's KAP regarding ED-PrEP. Furthermore, targeted outreach to underrepresented populations through alternative recruitment and data collection methods is recommended to enhance the inclusivity and representativeness of future studies.

## CONCLUSION

This study found that MSM in South Africa demonstrate relatively high levels of knowledge about ED-PrEP, particularly those residing in urban districts such as eThekweni and Ekurhuleni. Socioeconomic factors—such as higher educational attainment, higher income, and residence in highly urbanised areas—were positively associated with the intention to use and recommend ED-PrEP.

Historically, men have been reluctant to adopt prevention methods such as condoms and voluntary medical male circumcision (VMMC). In this context, ED-PrEP emerges as a promising alternative to expand HIV prevention coverage among men of all sexual orientations. Notably, the World Health Organization (WHO) updated its guidelines in 2023 to recommend ED-PrEP not only for MSM but for all men, reinforcing its viability as a widespread prevention strategy (WHO, 2023).

The study's findings emphasise the need for robust, well-structured education and awareness campaigns aimed at demystifying ED-PrEP. Such campaigns should present ED-PrEP as a safe, effective, and convenient alternative to daily oral PrEP. Importantly, the messaging should extend beyond MSM to include the broader male population, positioning ED-PrEP as a valuable option for all men seeking to prevent HIV infection.

The evidence generated by this study provides strong justification for the introduction and scale-up of ED-PrEP in South Africa. Addressing knowledge gaps, dismantling persistent myths, and expanding access through healthcare worker training and resource distribution can significantly strengthen the country's HIV prevention response. Ultimately, these findings offer not just data, but a potential catalyst for informed policy decisions and strategic interventions that can benefit MSM and all men across South Africa.

**Ethical Approval:** The study protocol was approved by the Institutional Review Board (IRB) of the University of Johannesburg.

**Conflicts of Interest:** None declared.

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