



# HIV PrEP and PEP awareness and practices among emergency doctors in Gauteng province

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**Background:** Emergency departments (EDs) are key settings for both occupational and non-occupational HIV prevention. While occupational post-exposure prophylaxis (PEP) is widely implemented, pre-exposure prophylaxis (PrEP) remains underutilised. Understanding clinicians' knowledge, attitudes, and practices (KAP) is critical to strengthening ED-based HIV prevention.

**Objectives:** To assess the KAP of ED doctors in Gauteng, South Africa, regarding HIV PrEP and PEP, and to identify barriers to their implementation.

**Method:** A prospective, cross-sectional, questionnaire-based study was conducted between June and October 2024 across five university-affiliated adult EDs in Gauteng. A self-administered questionnaire assessed personal PEP experience, PrEP/PEP availability, knowledge, prescribing practices, and perceived barriers. Knowledge scores were compared across subgroups using *t*-tests and chi-square tests.

**Results:** Of the 110 doctors recruited, 102 completed questionnaires. While 81.4% reported prior PEP use and demonstrated good knowledge of PEP (mean score 4.3/7), knowledge of PrEP was significantly lower (mean score 3.0/7;  $P < 0.00001$ ). Only 27.5% had ever initiated PrEP, and just 13.7% routinely offered it to at-risk patients. Barriers to PrEP prescribing included lack of rapid HIV testing (59.1%), time constraints (59.1%), and perceived inappropriateness for ED settings (54.5%). Higher knowledge scores were associated with having an HIV diploma and prior PEP use.

**Conclusion:** ED doctors demonstrated high familiarity and confidence in prescribing PEP, but poor knowledge and uptake of PrEP. Addressing knowledge gaps, ensuring resource availability, and integrating PrEP into ED protocols are necessary to enhance comprehensive HIV prevention in high-burden settings.

**Keywords:** HIV prevention; pre-exposure prophylaxis; post-exposure prophylaxis; emergency department; knowledge; attitudes; and practices (KAP); occupational exposure.

**What this study adds:** This study quantifies ED physicians' knowledge, attitudes, and practices toward both HIV PrEP and PEP in a high-burden setting. Knowledge and use of PEP was higher than PrEP. Barriers to PrEP implementation include limited rapid testing, time pressures, and perceived unsuitability of ED to implement PrEP.

## Introduction

HIV remains a leading global health challenge, with sub-Saharan Africa disproportionately affected. South Africa bears the highest HIV burden globally, with an estimated 8 million people living with HIV in 2024 – nearly 20% of the global total.<sup>1,2</sup> Despite the scale-up of antiretroviral therapy (ART) and reduced AIDS-related mortality, new infection rates remain high, particularly among adolescent girls, young women, men who have sex with men (MSM), and sex workers.<sup>3,4</sup>

Biomedical prevention strategies such as pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) are central to reducing HIV transmission. Oral PrEP, taken daily or event based by HIV-negative individuals at substantial risk, reduces the risk of sexually acquired HIV by over 90% when adhered to.<sup>5,6</sup> PEP, on the other hand, is a 28-day course of ART initiated within 72 h of potential HIV exposure to prevent seroconversion. Initially designed for occupational exposures

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such as needlestick injuries among healthcare workers (HCWs), PEP is now also recommended in non-occupational contexts, including sexual assault and other high-risk exposures.<sup>7</sup>

Within the healthcare sector, PEP is part of occupational safety protocols to reduce infectious risk. The WHO estimates that over 3 million percutaneous exposures occur annually among 35 million HCWs worldwide, over 90% in low- and middle-income countries.<sup>8</sup> The risk of HIV transmission is ~0.3% for percutaneous exposure and ~0.1% for mucocutaneous exposures.<sup>9</sup> In high-burden settings such as South Africa, HCWs face heightened occupational risk because of the elevated background prevalence of HIV among patients.<sup>10</sup>

Emergency departments (EDs) are strategic points for both occupational and non-occupational HIV prevention. They serve diverse, often underserved populations with increased HIV risk, many lacking access to routine healthcare.<sup>11</sup> Patients with HIV frequently visit EDs prior to diagnosis, representing missed opportunities for intervention.<sup>12</sup> HIV-positive individuals are more likely to visit EDs than those that are HIV-negative, making these settings ideal for screening, risk reduction, and linkage-to-care.<sup>13</sup>

Despite this, ED-based HIV prevention is underutilised. Historically, ED physicians managed acute HIV complications, with prevention left to specialist services.<sup>13</sup> Opt-out HIV testing and linkage programmes implemented in EDs in high-income countries achieved up to 74% linkage-to-care rates, but similar initiatives are rare in low-resource settings.<sup>14,15</sup> Barriers include limited clinician knowledge of HIV PrEP and PEP protocols, time constraints, lack of rapid HIV testing, and absent institutional support.<sup>16</sup>

South African national guidelines for PrEP and PEP have been published by the Department of Health to facilitate standardised implementation across healthcare settings.<sup>17,18</sup> These include guidance on indications, recommended regimens, monitoring protocols, and follow-up requirements. Effective implementation in high-pressure environments such as EDs depends on clinician, training and confidence. While EDs are not intended to provide long-term PrEP follow-up, they represent a valuable point of initial contact with at-risk individuals who may not otherwise access HIV prevention services. In such cases, ED-based initiation and counselling – coupled with referral to ongoing care – can serve as an important bridge, particularly in high-burden, low-access settings.

Given the urgency of reducing HIV incidence and the unique role of EDs, this study aimed to evaluate the knowledge, attitudes, and practices (KAP) of South African ED doctors regarding HIV PrEP and PEP, identifying gaps and barriers to effective implementation.

## Research methods and design

A prospective, observational, cross-sectional questionnaire-based study was conducted between 01 June and 31 October 2024 to assess the KAP of doctors regarding HIV PrEP and PEP in EDs. The study was conducted across five adult EDs affiliated with a university in Gauteng, South Africa. These departments are staffed and overseen by Emergency Medicine specialists.

The study population comprised doctors of varying levels of clinical seniority working in the selected EDs. At the time of the study, approximately 120 doctors were employed across the participating EDs. A convenience sampling method was employed, with a target sample size representing at least 80% of the employed doctors.

Before participation, all respondents received a written information sheet outlining the study's objectives, procedures, and voluntary nature. Participants were informed of their right to withdraw from the study at any time. Anonymity was preserved through the use of unique identifier codes, and confidentiality was maintained via secure storage of physical questionnaires and password-protected electronic databases accessible only to the research team.

Data were collected using a paper-based, self-administered questionnaire specifically developed for this study. The primary investigator distributed the questionnaires during scheduled site visits in coordination with the respective Heads of Department, ensuring minimal disruption to clinical service delivery.

The questionnaire was developed specifically for this study, guided by the 2021 South African National Department of Health guidelines for PrEP and PEP.<sup>17,18</sup> Face and content validity were established through expert review by two emergency medicine specialists with extensive experience in HIV management in the ED setting. An informal pilot test was conducted with five ED doctors from hospitals not included in the study to assess clarity, relevance, and completion time. Feedback from the pilot resulted in minor wording adjustments, with no substantive changes to the structure or content.

The questionnaire included items covering several key domains: participants' demographic and professional background; personal experience with PEP; the availability of PrEP and PEP in the ED; knowledge, prescribing practices, and perceptions regarding PrEP and PEP; and barriers to prescribing these interventions in the ED setting. Where applicable, correct responses were based on the 2021 South African National Department of Health guidelines.

Data were entered into Microsoft Excel (2025, Microsoft Corporation, Redmond, California, United States), checked for completeness, consistency, and logical accuracy, and then exported to Stata version 19 (2025, StataCorp, College Station, Texas, United States) for analysis. Descriptive statistics were used to summarise participant characteristics and KAP outcomes. Categorical variables were reported as frequencies

and percentages. As continuous data were normally distributed (confirmed by the Kolmogorov-Smirnov test), results were presented as means with standard deviations (s.d.).

Comparisons of items related to knowledge, drug availability, prescribing practices, perceptions, and barriers to prescribing between PrEP and PEP were conducted using the Student's *t*-test. Knowledge scores were calculated by awarding one point for each correct response to the seven PrEP-related and seven PEP-related questions, yielding a maximum possible score of 14 per respondent. The mean and s.d. of knowledge scores were calculated for the overall cohort and for subgroups defined by years of ED experience, possession of a postgraduate HIV diploma, and prior occupational use of PEP. Comparisons of mean knowledge scores across these subgroups were performed using Pearson's chi-square test. Statistical significance was determined using a two-tailed *P*-value threshold of  $< 0.05$ , with a 95% confidence level.

## Ethical considerations

Ethical clearance to conduct this study was obtained from the University of the Witwatersrand Human Research Ethics Committee (HREC) (M231155). Permission to conduct the study was obtained from the hospital manager at each participating facility.

## Results

Of the 110 participants enrolled in the study, 8 were excluded because of incomplete responses, yielding a final sample of 102 completed questionnaires. The participants included intern doctors, community service medical officers, medical officers, emergency medicine registrars, and emergency

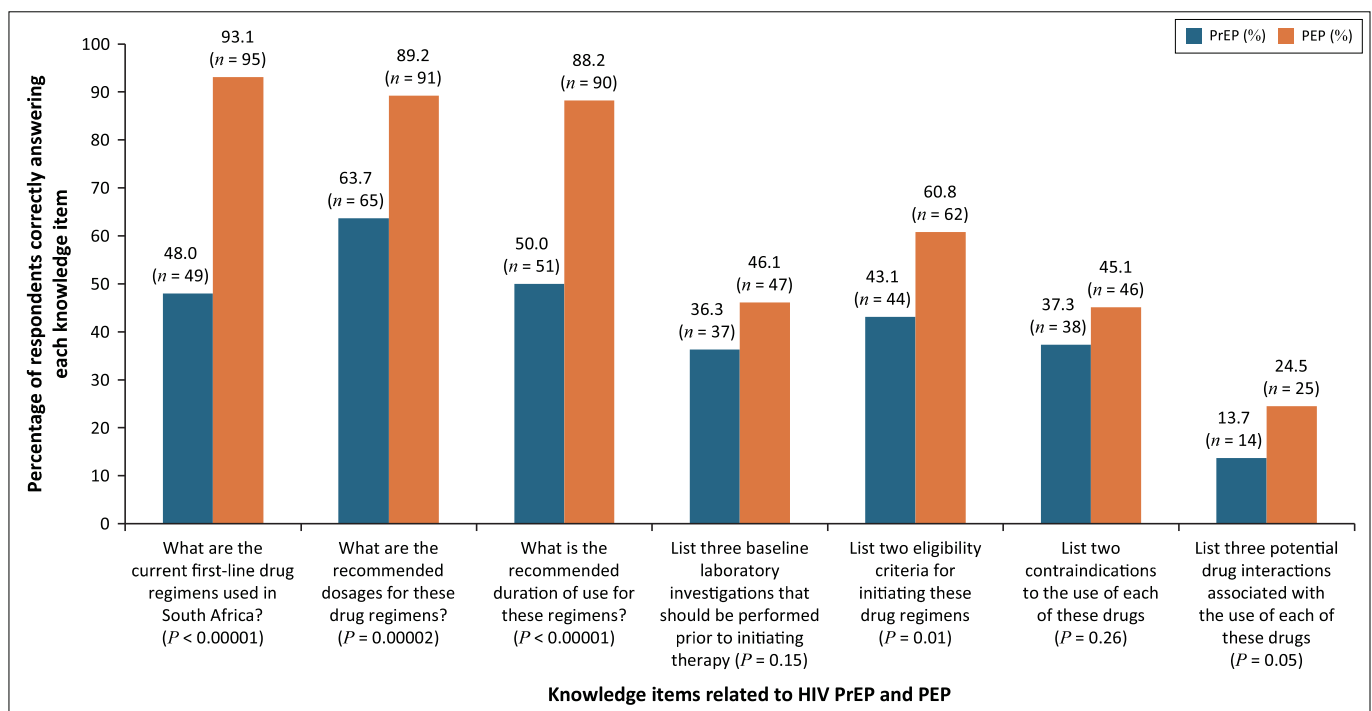
medicine specialists. Most participants had either less than 1 year or between 1 and 5 years of clinical experience in the ED. At the time of data collection, 15.7% held a postgraduate diploma in HIV management (Table 1).

A total of 83 participants (81.4%) reported prior use of PEP following an occupational exposure, all of which were because of needlestick injuries. Of these, 22 (26.5%) did not complete the full course of PEP – 17 (20.4%) cited adverse side effects, while five (6.0%) attributed non-completion to poor adherence. Notably, 66 participants (79.5%) had used PEP on more than one occasion. Furthermore, 54 participants (65.1%) reported that their personal experience with PEP increased their confidence in prescribing it to others.

Of the seven knowledge items assessed, the mean overall knowledge score was 7.3 (s.d. 2.7) out of 14, with a mean score of 3.0 (s.d. 1.7) out of seven for PrEP, and 4.3 (s.d. 1.3) out of seven for PEP ( $P < 0.00001$ ).

**TABLE 1:** Demographic and professional background of study participants.

Variable	<i>n</i>	%
<b>Job description</b>		
Intern doctor	15	14.7
Community service medical officers	13	12.7
Medical officer	48	47.1
Emergency medicine registrar	20	19.6
Emergency medicine specialist	6	5.9
<b>Duration of emergency department experience (years)</b>		
< 1	37	36.3
1–5	41	40.2
6–10	19	18.6
> 10	5	4.9
<b>Diploma in HIV management</b>	16	15.7



PrEP, pre-exposure prophylaxis; PEP, post-exposure prophylaxis.

**FIGURE 1:** Comparison of participants' knowledge across key domains related to HIV pre-exposure and post-exposure prophylaxis.

Figure 1 illustrates participants' knowledge across seven domains pertaining to HIV PrEP and PEP. Significantly more participants correctly answered four of the seven knowledge items for PEP versus PrEP. Overall knowledge was low regarding baseline investigations, contraindications, and drug interactions.

Table 2 compares mean knowledge scores across selected subgroups. Participants with a postgraduate diploma in HIV management had significantly higher scores. Similarly, prior occupational use of PEP was associated with significantly higher knowledge scores than among those without such experience.

Figure 2 presents participants' perspectives on the availability, prescribing practices, and perceptions of PrEP and PEP. Across all domains, PEP was more familiar and commonly implemented than PrEP ( $P < 0.00001$  for all comparisons). While 83.3% of participants reported that PEP

was readily available in their ED, only 17.6% said the same for PrEP. Awareness of department-specific prescribing guidelines was notably low for PrEP (5.9%) compared to PEP (47.1%). More participants had initiated PEP for a patient (89.2%) than PrEP (27.5%), and more felt confident prescribing PEP (84.3%) than PrEP (48.0%). Additionally, 82.4% reported arranging follow-up care for patients receiving PEP, compared to 44.1% for those receiving PrEP. While 95.1% believed that ED clinicians should prescribe PEP when indicated, only 60.8% expressed this view for PrEP. Notably, only 34.3% routinely asked patients about PrEP use, and just 13.7% reported regularly offering PrEP to at-risk individuals.

Among the 88 participants (86.3%) who did not routinely offer PrEP, the most frequently reported barriers included lack of rapid HIV testing in the ED ( $n = 52$ , 59.1%), time constraints ( $n = 52$ , 59.1%), the belief that PrEP should be initiated at HIV or primary care clinics ( $n = 48$ , 54.5%), lack of linkage to follow-up care ( $n = 33$ , 37.5%), uncertainty about PrEP availability in their hospital ( $n = 30$ , 34.1%), limited knowledge of PrEP regimens ( $n = 27$ , 30.7%), uncertainty regarding prescription duration ( $n = 23$ , 26.1%), and lack of clarity on eligibility criteria ( $n = 21$ , 23.9%).

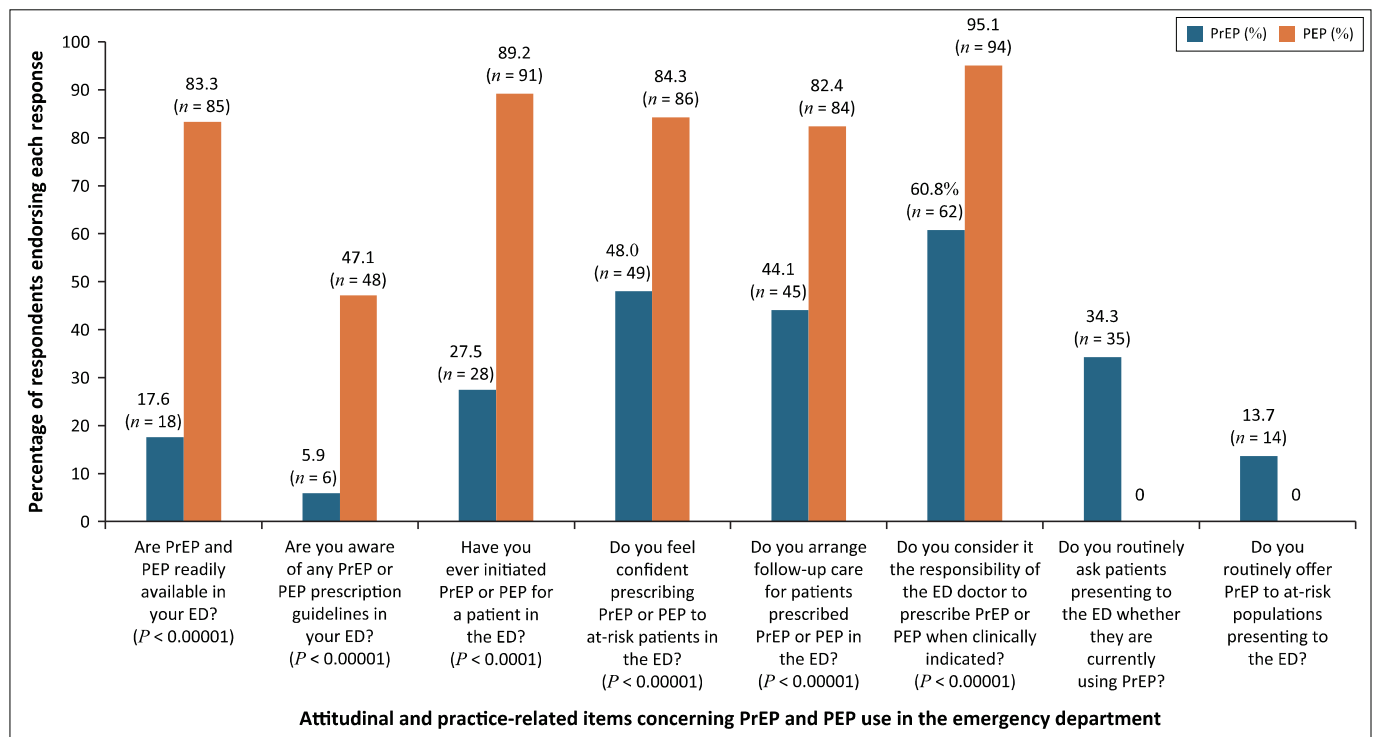
Among the 16 participants (15.7%) who did not routinely offer PEP, the primary barriers included the lack of rapid HIV testing in the ED ( $n = 15$ , 93.8%), uncertainty about where to access PEP after hours ( $n = 13$ , 81.3%) or during working hours ( $n = 7$ , 43.8%), and time constraints ( $n = 6$ , 37.5%).

**TABLE 2:** Comparison of mean HIV pre-exposure and post-exposure prophylaxis knowledge scores by emergency department experience, HIV diploma status, and prior post-exposure prophylaxis use.

	ED experience		Diploma in HIV management		Prior use of PEP following an occupational exposure incident	
	≤ 5 years ( $n = 78$ )	> 5 years ( $n = 24$ )	Yes ( $n = 16$ )	No ( $n = 86$ )	Yes ( $n = 83$ )	No ( $n = 19$ )
<b>Overall knowledge score</b>						
Mean	7.4	7.0	10.6	6.7	7.6	6.2
s.d.	2.6	2.9	1.9	2.3	2.7	2.5
$P$	0.2		< 0.00001*		0.02*	

ED, emergency department; PEP, post-exposure prophylaxis; s.d., standard deviation.

\*, statistically significant differences.



ED, emergency department; PrEP, pre-exposure prophylaxis; PEP, post-exposure prophylaxis.

**FIGURE 2:** Comparison of participants' views on the availability, prescribing practices, and perceptions of pre-exposure and post-exposure prophylaxis in the emergency department.



## Discussion

This study highlights significant gaps in the KAP of ED doctors in Gauteng, South Africa, regarding HIV PrEP and PEP. Although the majority of participants demonstrated adequate knowledge and confidence in prescribing PEP, knowledge and implementation of PrEP were notably poorer. These findings align with previous research indicating that while PEP has been more widely adopted in healthcare settings, PrEP remains underutilised because of lower awareness and confidence among clinicians.<sup>11,13</sup>

The high level of familiarity and confidence in prescribing PEP observed in this cohort is consistent with other studies conducted in similar high-burden, resource-limited settings.<sup>8,10</sup> This is likely attributable to the longer history of PEP implementation as a standard occupational safety intervention for HCWs.<sup>7</sup> The finding that 81.4% of respondents had personally used PEP following occupational exposure, with 79.5% of those reporting more than one use, further highlights the routine integration of PEP in clinical practice. However, the observation that 26.5% of respondents did not complete their PEP course – most commonly due to adverse effects – mirrors findings from other African studies and emphasises the need for enhanced counselling and support to improve adherence.<sup>10</sup>

By contrast, PrEP was perceived as less accessible, less familiar, and less routinely prescribed. Only 27.5% of participants had ever initiated PrEP for a patient, and just 13.7% routinely offered it to at-risk individuals. This gap is consistent with studies from both high- and low-resource settings, showing that clinicians often view PrEP as a service better suited to primary care or HIV clinics.<sup>12,13</sup> Similar barriers – including lack of rapid HIV testing, unclear follow-up pathways, time constraints, and insufficient knowledge of prescribing guidelines – have been reported in multiple settings.<sup>15,16</sup> Notably, less than 6% of respondents in this study were aware of department-specific PrEP prescribing guidelines, and only 17.6% reported that PrEP was readily available in their ED, compared to 83.3% for PEP. This disparity in availability and awareness emphasises the systemic challenges to integrating PrEP into ED workflows.

Importantly, the study also identified factors associated with higher knowledge scores. Respondents with a postgraduate HIV diploma and those with prior occupational PEP use demonstrated significantly higher knowledge scores, a finding consistent with previous reports that targeted training and personal experience enhance clinician competence and confidence in HIV prevention.<sup>10,15</sup> Interestingly, years of ED experience did not correlate with significantly better knowledge, suggesting that formal training and experience with PEP may be more influential than tenure in improving HIV prevention practices.<sup>16</sup>

These findings highlight critical opportunities to strengthen ED-based HIV prevention in South Africa. Interventions such as incorporating PrEP into occupational

safety programmes, expanding rapid HIV testing, providing clear clinical pathways for PrEP initiation, and targeted education for ED clinicians have been shown to improve uptake in other settings.<sup>11,13,15</sup> Furthermore, ensuring availability of PrEP in ED formularies and reinforcing departmental policies could address some of the identified barriers.<sup>7,17</sup>

Importantly, our findings do not propose shifting long-term PrEP provision to the ED; rather, they emphasise its potential role in identifying high-risk individuals, initiating time-sensitive prevention measures, and facilitating linkage to appropriate follow-up care. By addressing barriers such as resource limitations and unclear referral pathways, this ‘front-end’ role can be optimised without compromising the ED’s core emergency care mandate.

Given the central role of EDs in caring for high-risk and underserved populations,<sup>12</sup> enhancing their capacity to deliver both PEP and PrEP is crucial for advancing South Africa’s goals of reducing new HIV infections.<sup>3</sup> Addressing both individual knowledge gaps and systemic barriers will be essential to achieving this objective.

## Limitations

This study has several limitations. First, the use of a convenience sampling method may have introduced selection bias, and the findings may not be generalisable beyond the five EDs included in the study. Second, data were self-reported and may therefore be subject to recall bias and social desirability bias, particularly in reporting personal experience with PEP and prescribing practices. Third, the cross-sectional design provides a snapshot of clinician KAP at one point in time and does not allow for assessment of changes over time or the impact of interventions. Finally, the study was conducted in university-affiliated hospitals, which may have better resources and access to training than other facilities, potentially overestimating knowledge and practice levels compared to rural or less-resourced settings.

## Conclusion

This study demonstrates that while ED doctors in Gauteng, South Africa, exhibit strong knowledge and confidence in prescribing PEP, significant gaps remain in their KAP regarding PrEP. These gaps are compounded by systemic barriers, including limited availability of PrEP, lack of rapid HIV testing, unclear clinical pathways, and inadequate awareness of guidelines. Targeted educational interventions, improved institutional policies, and integration of PrEP into ED formularies are needed to empower clinicians to deliver comprehensive HIV prevention services. Strengthening ED-based HIV prevention efforts will be a crucial step towards achieving national and global targets for reducing new HIV infections in high-burden settings such as South Africa.

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### Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

### Authors' contributions

M.-L.V., as primary author, was responsible for study design, data collection, data analysis, article drafting, and final approval. M.S. and A.E.L. contributed to study design, data analysis, interpretation of results, article editing and revision, and final approval.

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### Data availability

The data that support the findings of this study are not publicly available due to participant confidentiality agreements and institutional ethical guidelines, but are available from the corresponding author, M.-L.V., upon reasonable request.

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