Exploring Healthcare Providers' Perspectives and Experiences in the Provision of Oral PrEP for Adolescent Girls and Young Women in a Sub-District in the City of Johannesburg, South Africa

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A research report submitted to the Faculty of Science, University of the Witwatersrand, in partial fulfilment of the requirements for the degree Master's in Public Health, Social and Behaviour Change Communication

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DECLARATION

I, Nomthandazo Blessings Gwebu, confirm that this research report is my original work, completed independently without external assistance. It is submitted in partial fulfilment of the requirements for the Master's degree in Public Health, with a specialisation in Social and Behaviour Change Communication, at the University of the Witwatersrand, Johannesburg. This report has not been submitted before for any degree or examination at any other institution.

Signed 

22nd day of September in 2025

DEDICATION

To my wonderful husband, Sabelo Gwebu, your constant support, encouragement, and love have been my greatest strength throughout this journey. Your unwavering belief in me has motivated me to keep going, and your patience and understanding have made this achievement possible. I am deeply grateful for your presence in my life and for always standing by my side.

To my siblings, Nobubele and Bhekani Khumalo, your confidence in me and your unwavering support have been invaluable. Your encouragement has driven me to push beyond my limits, and your presence has provided comfort and motivation. I truly appreciate your generosity, love, and belief in my dreams.

To my parents, Dr Jefrety Sibanda and Thembekile Sibanda, your commitment to education has been an inspiration. You have shown me that anything is possible through your pursuit of a PhD and a master's degree, respectively. Your remarkable achievements have been a source of inspiration, motivating me to follow my academic journey with determination. Your unwavering prayers gave me the strength and resilience to persevere; I am profoundly grateful for that. Thank you for believing in me and for all the sacrifices you have made.

ABSTRACT

Introduction

In South Africa, adolescent girls and young women (AGYW) face a significantly higher risk of HIV infection, driven by factors such as poverty, gender inequality, and limited access to healthcare. Oral pre-exposure prophylaxis (PrEP) is a proven preventative method, reducing HIV transmission risk by over 90% when used consistently. Despite its efficacy, AGYW face significant challenges in PrEP uptake and adherence. Healthcare providers (HCPs) play a pivotal role in PrEP delivery, but their perspectives remain underexplored.

Methods

This secondary qualitative analysis builds on the 2018 EMPOWER trial, which explored PrEP provision with adherence support clubs for AGYW aged 16–24 in a sub-district (Region F), Johannesburg. In-depth interviews were conducted with nine (n=9) HCPs (counsellors, a clinician, a nurse, a pharmacist, and community health workers), including Wits RHI project staff, who worked directly with AGYW in Hillbrow. A semi-structured interview guide explored HCPs' views on AGYW's HIV risks, PrEP benefits, and service delivery barriers. Data were analysed using inductive and deductive coding, guided by the HBM, with NVivo and Excel for thematic organisation.

Results

HCPs perceived high HIV susceptibility among AGYW due to risky behaviours like unprotected sex and relationships with "blessers" (perceived susceptibility), yet noted AGYW often underestimate HIV risk due to misconceptions (perceived barriers). They viewed PrEP as empowering for AGYW in contexts of limited sexual autonomy (perceived benefits), but key barriers included stigma, partner disapproval, and misinformation about PrEP's safety. Primary facilitators included peer support through EMPOWER clubs and tailored counselling (cues to action, self-efficacy). HCPs also underscored their need for enhanced counselling training to increase their self-efficacy in delivering adolescent-responsive PrEP services, emphasising their pivotal role in effective implementation.

Conclusion

HCPs' perspectives underscore the need for multifaceted strategies to improve PrEP use and adherence among AGYW. HCPs alongside community health workers (CHWs), health promoters and counsellors can strengthen counselling to address stigma and misconceptions, refer AGYW to facilities or mobile clinics with oral PrEP and other alternatives, and promote peer and partner involvement through adherence clubs. Enhanced training is critical to optimise adolescent-responsive service delivery and reduce HIV risk for AGYW in South Africa.

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I also extend my heartfelt thanks to Wits RHI for providing the foundational study that underpins this secondary research. Their pioneering work and comprehensive data were instrumental in the success of this research.

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ABBREVIATIONS AND ACRONYMS

AGYW	Adolescent Girls and Young Women
ART	Antiretroviral treatment
EMPOWER	Enhancing Methods of Prevention and Options for Women Exposed to Risk
FDA	(United States) Food and Drug Administration
GCP	Good Clinical Practice
GPP	Good Participatory Practice ICF Informed Consent Form
ICH	International Conference on Harmonisation
HIV	Human Immunodeficiency Virus
HCP	Health care providers (nurses, doctors, counsellors and clinicians)
HBM	Health Belief Model
MSM	Men who have Sex with Men
PrEP	Pre-Exposure Prophylaxis
REC	Research Ethics Committee
SA	South Africa
SSA	sub-Saharan Africa
USA	United States of America
TFV	Tenofovir
TD	Tenofovir disoproxil fumarate
TDF/FTC	Emtricitabine and tenofovir disoproxil fumarate (Truvada)
WHO	World Health Organisation
PWID	People Who Inject Drugs
PMTCT	Prevention of mother-to-child transmission
HREC	Human Research Ethics Committee

CHAPTER 1. INTRODUCTION

1.1 Background

Globally, HIV remains a critical public health challenge, with certain populations bearing a disproportionate burden. In 2024, women and girls made up 45% of all new HIV infections, highlighting persistent gender disparities in HIV transmission worldwide(1). This disparity is markedly more evident in sub-Saharan Africa, where adolescent girls and young women (AGYW) are among the most vulnerable, with women and girls representing 63% of new HIV infections in the region (1). In South Africa, AGYW aged 15–24 face a stark HIV burden, with a prevalence of 6.9%, nearly double the 3.5% among their male peers, and an incidence rate four times higher (1.14% vs. 0.35%) (2,3). Additionally, AGYW contribute 37% of all new infections among women in South Africa, demonstrating the critical need to address the unique risks they face through targeted prevention measures (2).

A pre-emptive strategy against HIV infection is the use of oral Pre-Exposure Prophylaxis (PrEP). This daily pill can lower the risk of transmission by 90% when taken consistently and is intended to complement broader HIV prevention efforts (4,5). PrEP was approved by the United States Food and Drug Administration (FDA) in 2012 and introduced in South Africa in 2016, targeting sex workers, MSM, serodiscordant couples, and AGYW (4,6). AGYW face increased HIV risk due to early sexual debut, engaging in sexual activities with multiple partners simultaneously, and inconsistent condom use (6). However, PrEP's success depends not only on its clinical efficacy but also on how healthcare providers (HCPs) deliver these services.

The World Health Organisation (WHO) issued guidelines in 2012 recommending PrEP for key populations, initially excluding AGYW (7). In 2015, WHO extended oral PrEP to all vulnerable groups, including individuals engaged in sex work, AGYW and people who inject drugs (PWID), as it proved effective in reducing HIV transmission (4,7,8). While research has explored AGYW's barriers to PrEP uptake, such as limited access to healthcare, poverty, gender inequality, and exposure to violence, HCPs' perspectives remain underexplored (4,13).HCPs navigate a complex landscape of clinical expertise, cultural sensitivity, and patient-centred care, making their insights essential for overcoming barriers to PrEP uptake and adherence (10,11)

In South Africa, PrEP programs target AGYW due to their susceptibility to HIV, driven by early sexual debut, multiple partners, and inconsistent condom use (6,10). Although PrEP has

been socially accepted in South Africa, low adherence continues to be of interest in SSA, and studies have been conducted to identify barriers to PrEP uptake and adherence in AGYW (7,8,12,13). Barriers to the uptake of PrEP and elevated risk of HIV among AGYW have been attributed to structural factors like limited access to healthcare, poverty, gender inequality, and exposure to violence (4,9) HCPs play a critical role in promoting, prescribing, and supporting oral PrEP, yet their experiences are less studied than patient perspectives, creating a gap in understanding effective PrEP delivery (10,11).

This secondary qualitative study builds on The EMPOWER trial, an unblinded and randomised controlled trial conducted 2016 -2018 among HIV negative AGYW aged 16-24 in a sub-district in Johannesburg, South Africa, and Tanzania (5). The EMPOWER trial offered an array of HIV prevention services such as HIV screening, testing, daily oral PrEP and gender-based violence (GBV) screening, with half of the participants being randomly selected to participate in oral PrEP adherence support clubs (EMPOWER clubs) (5). The primary study (EMPOWER) assessed the practicality, acceptability, and safety of providing oral PrEP within a comprehensive HIV package for AGYW (5). This study aims to explore HCPs' perceptions of AGYW's HIV risks and PrEP suitability, identify implementation barriers and facilitators, and investigate their recommendations for improving service delivery and adherence support, aiming to inform strategies that enhance PrEP implementation in South Africa's high-prevalence HIV context and contribute to global prevention efforts.

1.2 Literature Review

1.2.1 Healthcare providers' attitudes and beliefs

Health providers' attitudes significantly impact the uptake and rejection of services, affecting AGYW's health outcomes (14–16). Furthermore, healthcare providers' attitudes significantly impact AGYW's willingness to access PrEP services (14). In a review of studies from 2016 that examined the perspective of HCPs in Zimbabwe, Kenya, and South Africa, it was noted that the attitudes and beliefs of healthcare professionals often align with those of the larger community (15,17,18). In Tanzania (17), Zimbabwe (18), Kenya, and South Africa (19), cultural norms discouraging pre-marital sexual engagement shaped HCPs' views. Many HCPs believed that providing PrEP to unmarried AGYW would promote sexual promiscuity and discourage condom use, leading to unwanted pregnancies and STIs and fostering community stigma (11,20,21). Rural healthcare providers, due to their community ties, recognised how

their perceptions of AGYW's sexuality influenced their challenges in promoting PrEP use among young girls (19).

HCPs in Tshwane, South Africa, encountered challenges when offering SRH and PrEP services to AGYW, perceiving them as their daughters and sometimes treating them negatively, mirroring interactions with their children (22). This revealed that these providers faced difficulties in managing their overlapping responsibilities as medical professionals and community members. This often led to service provision tinged with underlying stigma due to conflicting societal norms and professional obligations. However, HCPs were mindful of the impact their attitudes could have on AGYW-seeking support. Some HCPs acknowledge the use of PrEP in AGYW, as some engage in sex before 18 (20,23). However, some providers feel that it is more appropriate to encourage abstinence over PrEP use (22). HCPs hold the view that young people lack the self-efficacy to assume accountability for their health (16,23). They felt that young women (20–24 years) are more mature and can adhere, whereas adherence in adolescents is debatable (23). Providers hold the view that PrEP should be provided to AGYW with older partners. This perspective is grounded in the understanding that older partners may have multiple partners and the AGYW's inability to negotiate safer sex, such as condom use, due to unbalanced power relations (23).

PrEP implementers in South Africa and Tanzania share optimistic views on PrEP (16,17). They emphasised the importance of providing PrEP to AGYW owing to their vulnerability to HIV. AGYWs' vulnerability to HIV stems from increased exposure to sexual violence and participation in risky behaviours (16,17). The providers also underlined the critical role that PrEP plays in diminishing HIV transmission rates and lowering the overall prevalence of the virus among AGYW (10,16,17). However, they also expressed disappointment over the limited interest in PrEP among AGYW (10,16,17). Some positive perspectives on PrEP include its potential to achieve national HIV targets and its capacity to offer discordant couples an opportunity to preserve their relationships (11).

1.2.2 Healthcare providers' knowledge of PrEP

The success of PrEP interventions requires that HCPs be aware of PrEP, have adequate knowledge and counselling skills to engage with their patients, and have positive attitudes that encourage people to take PrEP consistently (24). The negative attitudes of health providers could be attributed to inadequate provider knowledge, evidence-based understanding of PrEP, and reluctance to address sexual risks (16). During a study in Zimbabwe, some providers

exhibited inadequate knowledge by mistakenly linking PrEP to pregnancy, often confusing it with prevention of mother-to-child transmission (PMTCT) services (23). There are misconceptions about the effect of PrEP on contraceptive efficacy, even leading to pregnancy termination (23). This highlights the need to clarify that PrEP is intended for HIV-negative individuals and does not affect pregnancy.

A review of the literature focusing on HCPs working with AGYW in Zimbabwe found that providers struggle to prescribe PrEP because of their limited experience with PrEP (23). This challenge is further intensified by the lack of precise guidelines and information on PrEP available to them (23). A study conducted in Lesotho further revealed that certain community-based PrEP service providers lacked comprehensive information, making them susceptible to inadvertent provision of inaccurate health education within the community (11). Healthcare practitioners in South Africa reported a prevalent community misconception about PrEP, where individuals mistakenly believe it provides invincibility that prevents unplanned pregnancies, causes infertility, and results in pregnancy termination (10,11). Additional misconceptions include the belief that one dose of the pill provides permanent protection against HIV, that oral PrEP can lead to HIV infection, and that PrEP and ART are synonymous (10). These misconceptions are perceived to stem from miscommunication between end users and healthcare practitioners, as well as poor messaging in PrEP advertisements (11).

1.2.3 Healthcare provider experience, barriers, and facilitators of PrEP service implementation.

Past research has delved into PrEP providers' experiences and identified key perceived barriers to effective intervention implementation. These include concerns about inadequate clinical capacity, reservations about providing PrEP to patients with low medication adherence, and discomfort when discussing patients' sexual history (24). In studies conducted in Tanzania, Zimbabwe, Kenya, and Malawi, healthcare professionals indicated that their ability to promptly offer PrEP was restricted by medication scarcity and insufficient availability of properly qualified personnel, particularly those trained to administer PrEP (18,25). They recognised that the effectiveness of PrEP services depends on the presence of adequately trained and qualified PrEP providers. One barrier to effective implementation is the lack of training, which causes providers to lack self-efficacy in discussing and delivering high-quality PrEP services to adolescents (17,25). In South Africa's HER Story 2 study (10), program implementation encountered hurdles, including ensuring a consistent PrEP supply, slow rollout, and

collaboration with external providers for pharmaceutical distribution to other PrEP facilities. This affected the AGYW's interest in the program, adherence, and dropout. Other barriers to PrEP service implementation and adoption identified by HCPs included different costs, such as fees for health facility consultations and transportation, particularly in rural areas (18).

The obstacles to offering and embracing PrEP revolve around issues of confidentiality in providing care for AGYW. Several HCPs noted that certain peers require adolescents to involve their parents in seeking services, and some show a lack of attentiveness to adolescents' needs (17). These obstacles can influence AGYW's willingness to access PrEP services and can also have repercussions on the delivery of PrEP services (17). HCPs in Zimbabwe and South Africa gave insights into their perceived obstacles to the acceptance and consistent use of PrEP. They perceived that the inconsistent use of PrEP among AGYW and failure to return to facilities for refills could be attributed to a lack of disclosure to family members and a lack of family support (10,23).

In some studies, nurses raised concerns about PrEP, specifically regarding pill size, side effects, and delivery methods through HIV clinics, which could lead to reduced engagement (25,26). Their doubts, influenced by past experiences with PrEP distribution, centred on the AGYW's ability to consistently take the daily pill due to its size (25,26). As reported by healthcare professionals, there is a noted preference among AGYW for injectables rather than oral tablets, likely due to their familiarity with contraceptive injections (10). This approach holds promise for addressing barriers to generating interest in PrEP (10).

Beyond the challenges encountered by HCPs in delivering PrEP services, there exist significant recommendations and best practices that are believed to enhance the quality of PrEP services (11). Healthcare practitioners in Lesotho cited the importance of regular capacity building, disclosing that training enhanced their self-efficacy in effectively providing PrEP services (11). HCPs in Zimbabwe emphasised the need for youth-friendly PrEP services. They suggested that PrEP services be provided through confidential avenues such as outpatient clinics, aiming to mitigate stigma and encourage AGYW to seek PrEP services (18).

Given the complex array of challenges, attitudes, and barriers discussed, exploring HCPs' perspectives on PrEP for AGYW has emerged as a crucial avenue for developing informed strategies to enhance accessibility and uptake, thereby benefiting the well-being of this at-risk group.

1.3 Problem Statement

South Africa bears a significant HIV burden, with AGYW aged 15–24 disproportionately affected, exhibiting an HIV prevalence of 6.9% compared to 3.5% among their male peers and an incidence rate of 1.14% versus 0.35% in 2022 (2,3). This disparity contributes to AGYW accounting for 37% of new HIV infections among women, underscoring the urgent need for effective prevention strategies (2). Oral PrEP P which reduces HIV transmission risk by over 90% when consistently adhered to, has emerged as a cornerstone of HIV prevention in South Africa (4,5). Studies from Uganda and Kenya have demonstrated that daily PrEP use significantly reduces HIV incidence among women, affirming its potential in high-prevalence settings (27). Since its introduction, PrEP has gained traction in South Africa, as highlighted by UNAIDS, with programmes rolled out across multiple regions, including Johannesburg (28). Despite this progress, there remains a limited understanding of HCPs' perspectives on navigating the complexities of PrEP delivery for AGYW in Johannesburg's high-prevalence context. This knowledge gap impedes efforts to optimise PrEP programmes, limiting their effectiveness in reducing HIV incidence among this vulnerable population.

1.4 Justification

Healthcare providers are uniquely positioned to strengthen oral PrEP programmes for AGYW in South Africa's high-prevalence HIV context, where tailored interventions are urgently needed to curb new infections (3). Through their frontline engagement in clinical and community settings, HCPs possess critical insights into the social, cultural, and logistical barriers, such as stigma, limited healthcare access, and adherence challenges, that hinder effective PrEP delivery (7,8,10,11). Their experiences in counselling AGYW, managing clinic-based challenges, and addressing community-level stigma equip them to propose practical, context-specific PrEP implementation strategies. This study aims to fill this gap by exploring HCPs' perspectives on HIV risk perceptions, barriers, facilitators, and recommendations for improving PrEP delivery in Johannesburg, offering a pathway to develop targeted, evidence-based interventions that enhance PrEP uptake and adherence, ultimately advancing South Africa's HIV prevention efforts.

1.5 Research Question

What are the perspectives and experiences of HCPs regarding oral PrEP provision for AGYW (16-24 years) in Johannesburg, South Africa?

1.6 Research Aim and Objectives

Aim

This qualitative study aimed to explore the perspectives and experiences of HCPs involved in the provision of oral PrEP to AGYW aged 16-24 years in a sub-district in Johannesburg, South Africa.

Objectives

1) To explore HCPs' perceptions of AGYW HIV risks and PrEP suitability, a sub-district in Johannesburg, South Africa, in 2018
2) To identify specific implementation barriers and facilitators from HCP perspectives in the provision of oral PrEP services for AGYW in a sub-district in Johannesburg, South Africa, in 2018
3) To examine HCPs' recommendations for improving service delivery and adherence support for AGYW in a sub-district in Johannesburg, South Africa, in 2018

CHAPTER 2. MANUSCRIPT: JOURNAL OF THE INTERNATIONAL AIDS SOCIETY

This is a draft manuscript and has not been submitted for publication.

This manuscript has been prepared following the guidelines set by the *Journal of the International AIDS Society* (JIAS) while also meeting the requirements for a master's research report at the University of the Witwatersrand (Wits). The detailed JIAS manuscript preparation guidelines are included in the Appendices of this report – please refer to Appendix 4 for the guidelines. The references, which are typically included at the end of the manuscript, are in the Appendices, in accordance with the Wits research report guidelines.

Exploring Healthcare Providers' Perspectives And Experiences In The Provision Of Oral Prep For Adolescent Girls And Young Women in a Sub-District in the City of Johannesburg, South Africa

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2.1 Abstract

Introduction

Adolescent girls and young women (AGYW) in South Africa face disproportionately high HIV incidence, yet adherence to oral pre-exposure prophylaxis (PrEP) remains low. Healthcare providers (HCPs) are central to PrEP implementation, offering unique perspectives on both client challenges and the practicalities of service delivery. This study explores HCPs' perspectives on delivering PrEP to AGYW in Johannesburg, identifying challenges and strategies for effective service delivery.

Methods

We conducted a secondary qualitative analysis of data from the EMPOWER trial (2016-2018), which integrated oral PrEP with adherence support clubs for AGYW. We purposively selected nine HCPs (counsellors, nurse, clinician, pharmacist, and community health workers) involved in the trial for in-depth interviews, conducted from February 2017 to February 2018. Using a semi-structured interview guide, we explored their views on HIV risks, PrEP as a prevention method, and barriers to service delivery. We analysed the data using inductive and deductive coding, guided by the Health Belief Model (HBM). The small sample size (n=9) and focus on a single urban setting limit generalisability but provide insight into PrEP implementation.

Results

HCPs reported that AGYW often underestimated their HIV risk (perceived susceptibility/severity), undermining consistent PrEP use. While PrEP was described as empowering young women to protect themselves in unequal or violent relationships (perceived benefits), adherence was constrained by stigma, pill burden, misconceptions, and partner or family opposition (perceived barriers). Peer support through EMPOWER clubs and provider encouragement functioned as important cues to action, while HCPs' counselling effectiveness depended on their self-efficacy, strengthened by targeted training.

Conclusion

HCP perspectives highlight both the empowering potential of PrEP and persistent barriers limiting adherence. Strengthening provider training, task-sharing with other health cadres, integrating peer-led support, and engaging families and partners are critical to improving

uptake. Although context-specific and limited by a small sample size, these findings offer valuable lessons for scaling adolescent-responsive PrEP delivery.

2.2 Introduction

Women and girls of all ages are disproportionately impacted by HIV, particularly in sub-Saharan Africa, where they represent the majority (63%) of new infections (1). Globally, the scale of the epidemic is significant, with women and girls accounting for 45% of all new HIV infections in 2024 (1). South Africa exemplifies this disparity, with AGYW facing an incidence rate of 1.14% compared to 0.35% among adolescent boys and young men, a prevalence nearly double that of males (6.9% vs. 3.5%) (2,3). AGYW in South Africa contribute 37% of new HIV infections among women, driven by early sexual initiation, multiple partners, and inconsistent condom use (2). Oral PrEP, introduced in 2016 in South Africa, offers over 90% efficacy in preventing new HIV infections when adhered to consistently (4,5). AGYW's high vulnerability and contribution to the epidemic underscore the urgent need for effective and accessible prevention strategies tailored to their needs (2).

Despite social acceptance, low adherence to PrEP remains a concern in SSA, driven by structural factors such as limited healthcare access, poverty, gender inequality, and exposure to violence (4,9). However, successful PrEP implementation hinges not only on biomedical efficacy but also on HCPs and their experiences when delivering these services. While considerable attention has been given to PrEP awareness and uptake among AGYW, there remains a dearth of information on how HCPs perceive and navigate the complexities of PrEP implementation (10).

HCPs play a vital role in executing PrEP programs, as their perceptions and experiences directly impact the quality of counselling, provision of accurate information, and overall engagement with AGYW. Understanding these viewpoints can illuminate the challenges and opportunities they face, offering valuable insights for enhancing program design and delivery.

Although numerous studies have explored barriers and facilitators to PrEP uptake and adherence, there is a critical gap in the literature concerning HCP insights into PrEP implementation (10). Most existing research focuses on factors affecting PrEP usage among various populations, neglecting the perspectives of HCPs who are essential to the successful rollout of oral PrEP. This study aimed to gain insights into the perspectives of HCPs regarding their experiences, attitudes, challenges, successes, lessons learned, and suggestions for

improving future PrEP services. By understanding their viewpoints, we can formulate theory-based efforts and interventions to strengthen and enhance PrEP service delivery.

2.3 Methods

2.3.1 Study Design and Population

The EMPOWER (Enhancing Methods of Prevention and Options for Women Exposed to Risk) demonstration project provided data for this study. It was conducted during the early stages of oral PrEP introduction and aimed to evaluate the acceptability and viability of offering oral PrEP to AGYW aged 16-24 in South Africa. Although PrEP was licensed in South Africa, its availability was primarily restricted to research settings (43).

The EMPOWER trial enrolled a cohort of HIV-negative AGYW (16-24 years). It provided them with a comprehensive HIV prevention package, which included oral PrEP, gender-based violence (GBV) screening, HIV testing, adherence counselling, and participation in adherence support clubs (EMPOWER clubs). These clubs aimed to enhance PrEP adherence, build resilience to stigma and GBV, and address relationship dynamics. HCPs were interviewed as part of the trial to explore their experiences and perspectives on providing PrEP to AGYW.

2.3.2 Study Setting

The primary study took place in Region F, City of Johannesburg, focusing on Hillbrow and its surrounding areas. Hillbrow hosts a diverse demographic, including South Africans from various provinces, migrants, and refugees from across Africa (28,29). This densely populated neighbourhood suffers from congestion, unsafe housing, and frequent power and water supply interruptions (28,29). Many young people travel through the area daily because secondary schools surround it (30). Economically, over thirty per cent of the population is projected to be unemployed, relying on income from domestic work, informal trading, and mobile cross-border trading (28,29).

2.3.3 Sample

We recruited twenty (n=20) participants for IDIs as part of the EMPOWER trial, including ten (n=10) HCPs directly involved in the trial and ten (n=10) stakeholders, such as traditional healers and community advisory board (CAB) members, with or without PrEP experience. Participants also included Wits RHI project staff and those who worked at the adolescent clinic

in Hillbrow. For this secondary analysis, we focused on a subsample of nine participants: four counsellors, one clinician, one nurse, one pharmacist, and two CHWs. We specifically approached and invited HCPs who worked directly with AGYW, providing services such as SRH and psychosocial support.

Stakeholders and other HCPs not involved in the intervention were excluded, as the analysis aimed to capture the experiences of HCPs who delivered PrEP to this group as part of a demonstration project.

2.3.4 Data Collection

Between February 2017 and February 2018, Serial in-depth interviews (IDIs) took place in the EMPOWER trial at the Wits RHI office in Johannesburg, South Africa. A semi-structured interview guide directed the interviews. The IDI questions examined HCPs' views on the HIV risks AGYW face, their perspectives on PrEP as an HIV prevention method, and the broader impact of PrEP, including its influence on how girls are perceived, the stigma they may encounter, violence risk within relationships, and adherence challenges. Interviews were conducted in a private room by proficient social scientists in English and Zulu, but the majority preferred English. Each interview lasted between 45 and 60 minutes. All sessions were recorded and the audio's transcribed verbatim for analysis. The model structured the analysis of healthcare providers' perspectives, aiming to capture both their views on AGYW's experiences and their own experiences with PrEP.

2.3.5 Data Analysis

Inductive and deductive coding techniques guided this secondary analysis, using the Health Belief Model (HBM) as the theoretical framework. Major themes that emerged during the coding process were organised in an Excel matrix. To ensure coding reliability, the coding process underwent supervisor reviews to resolve discrepancies and achieve inter-coder agreement. Developed by Irwin M. Rosenstock and colleagues at the U.S. Public Health Service, the HBM explains how individual beliefs and perceptions shape health-related behaviours (30,31). The model structured the analysis of healthcare providers' perspectives on PrEP delivery to AGYW.

The model's six key constructs are perceived susceptibility (the belief in one's risk of experiencing a health issue), perceived severity (the belief about how serious the consequences could be), perceived benefits (the belief in positive outcomes from preventive actions),

perceived barriers (the belief about obstacles that might hinder action), self-efficacy (confidence in one's ability to carry out the behaviour), and cues to action (internal or external factors that trigger action) (30,31). These constructs provided the foundation for examining how healthcare providers assess HIV risk, perceive PrEP's benefits and barriers, and approach service delivery for AGYW. Figure 1 presents the themes identified using the HBM framework.

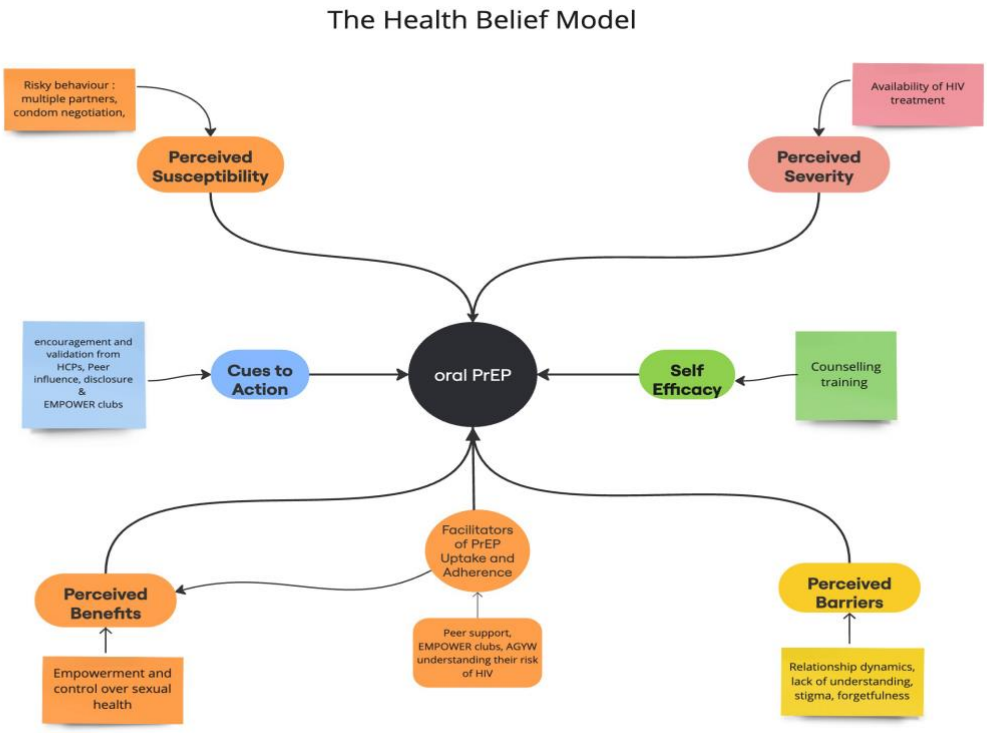

Figure 1: Adapted HBM for HCP perspectives and experiences on oral PrEP use among AGYW in Johannesburg, South Africa

2.3.6 Ethical Considerations

The Human Research Ethics Committee (HREC) Medical of the University of the Witwatersrand, Johannesburg, South Africa, approved primary and secondary (HREC Medical clearance certificate no.: M240432 – see Appendix 3) studies. Participants in the primary study provided written informed consent.

In addition to HREC approval, Wits RHI permitted access to data for this secondary study. Pseudonyms were employed to safeguard participant identities, and access to coded data on Microsoft Teams was restricted to supervisors, the study team, and me (NBG). While no new data were collected, ethical principles upheld in the primary study were maintained throughout the secondary study.

2.4 Results

Nine of the twenty healthcare practitioners initially enrolled in the primary study were included in this secondary analysis. Guided by the Health Belief Model (HBM), we identified key themes that reflect both healthcare providers' perspectives on AGYW experiences with PrEP and their own experiences in delivering PrEP services. Specifically, the themes 'Perceived susceptibility and severity,' 'Perceived benefits/facilitators of PrEP uptake and adherence,' and 'Perceived barriers/challenges in PrEP uptake and adherence' capture HCPs' perspectives on the AGYWs' experiences with PrEP use. In contrast, the themes 'Cues to Action' and 'Self-Efficacy' reflect HCPs' own professional experiences/challenges in terms of their capacity to support AGYW (such as encouraging) and their confidence in delivering effective PrEP counselling and adherence support.

2.4.1 HCP Views on PrEP for AGYW

Most HCPs strongly advocate for oral PrEP as a valuable intervention to reduce HIV vulnerability among AGYW. They view PrEP as a transformative tool with the potential to contribute to an HIV-free generation, particularly for a population facing elevated risks due to social and relational factors. One HCP emphasised, *"Whoever came up with that should be commended because now at least there will be an HIV-free generation because of this PrEP"* (HCP 6).

PrEP's empowerment potential is particularly valued in contexts where AGYW have limited sexual autonomy, such as relationships marked by sexual violence, unfaithful partners, or unequal power dynamics. For instance, an HCP noted:

> *"You have situations where you are in a stable relationship, but you don't have much control of condom use, so this is also great for that kind of person, and then you have people who have had experiences of being violated and in that situation obviously you don't have any control, so this is also great for that kind of a participant."* (HCP 8)

Some participants also recognise PrEP's effectiveness in addressing specific risks faced by AGYW, including multiple sexual partnerships and exposure to unfaithful partners. However, they identified implementation challenges, notably low adherence, partly attributed to AGYW's underestimation of their HIV risk. One HCP remarked, "*Honestly, I think PrEP in general is good"* She further went on to say, *"... the prevention part of it is great, because of their risky behaviour"* (HCP 4), but highlighted that adherence is undermined by this issue.

2.4.2 Perceived Susceptibility and Severity: HCPs' Views on AGYW's Risk of HIV Infection

Some HCPs identified several behaviours and contextual factors that heighten AGYW's vulnerability to HIV infection. These include engaging in multiple sexual partnerships, inconsistent condom use, and relationships with partners living with HIV, often undisclosed or poorly managed.

> *"Their risk is high, and I spoke to a few who already have partners who are HIV positive. One was scared and came back saying she was not coming back for the tablets; she was going to get PEP because the condom broke. She knows that the partner is HIV positive, so she just had that anxiety."* (HCP 7)

Another HCP noted, *"You will find that some of them have multiple partners even though they don't want to disclose parts of their lives."* (HCP 1), highlighting hidden risk behaviours.

Despite some awareness of HIV transmission and prevention, most providers reported that AGYW often perceive it as an abstract or irrelevant threat, underestimating both their susceptibility to infection and the severity of its consequences. This perception is partly attributed to the availability of antiretroviral treatments, which leads some AGYW to view HIV as manageable. HCP 4 expressed:

> *"For them, HIV is an abstract thing; it is there but not relevant to their lives... basically in their minds, it is something that happens to other people."*

> *"They don't use condoms, and I don't know if they understand how important it is to prevent HIV or if they think that even if they test HIV positive, they can just get treatment."* (HCP 1)

Another HCP added that, while AGYWs are aware of HIV, they do not prioritise it, focusing instead on other immediate concerns: *"They know about HIV, but it is not their number one problem. They have other pressing issues; it's like okay there is HIV yes it exists but it's not their top concern."* (HCP 3)

This low perceived susceptibility and severity poses significant barriers to AGYW's engagement in HIV prevention strategies.

2.4.3 Perceived Benefits and Facilitators of PrEP Uptake and Adherence

- Perceived Benefits of PrEP

Building on HIV risk severity awareness, HCPs highlighted the perceived benefits of PrEP, particularly its ability to empower AGYW by giving them control over their sexual health. Many viewed it as a proactive strategy alongside condom use for preventing HIV. This sense of empowerment was also observed in how one HCP described PrEP as an "eye-opener", allowing AGYW to take ownership of their safety without relying on a partner.

> *"It is sort of like an eye opener for them that they can have something that they can use to own up for their safety in a way… you don't even need to tell somebody if you don't want to, that I am using this to protect myself…"* (HCP 2)

Another HCP emphasised that PrEP was essential for AGYW in challenging relationships, allowing them to maintain control over their health even if their partner was not always faithful.

> *"Taking it correctly helps them even lead positive lives because some of them have unfaithful partners and they still take it…."* (HCP 10)

In addition to empowering AGYW, HCPs highlighted that PrEP offers significant protection in various relationship contexts. AGYW in unstable or casual relationships benefit from PrEP, as it allows them to protect themselves despite having multiple partners. Those in stable relationships, where they lack control over condom use, also find value in PrEP. Furthermore, AGYW who have experienced sexual violence can safeguard their health with PrEP, even when they have little control over protection in these situations. While some HCPs acknowledge that PrEP is not a "magic bullet," they agree that it provides essential protection in these scenarios.

> *"We have people who are not in relationships who just have casual partners they have sex with, and for them, this is the best thing that could ever happen to their lives because you have multiple partners, but you are able to protect yourself."* (HCP 8)

- Facilitators of PrEP Uptake and Adherence

Peer support emerged as a key facilitator of PrEP uptake and adherence among AGYW. HCPs observe that AGYW who participate in EMPOWER clubs and engage in discussions with their peers about PrEP are more likely to continue using the medication. Some providers noted that discussions enabled AGYW to learn from others' experiences, gain encouragement, and develop strategies to remain adherent, especially when considering discontinuation.

"Getting support from your peers is so much important…. you are sharing with other peers what has happened to you… also, when you are faced with taking tablets how do you take your pills consistently without fail? What helps you?" (HCP 1)

In addition to peer support, understanding personal vulnerability to HIV also drives adherence. A few HCPs noted that AGYW are more likely to take PrEP consistently when they recognise their risk. As one provider explained: *"…if the person knows that they are at risk or they do need it, then they would remember to take it"* (HCP 10).

2.4.4 Perceived Barriers: Challenges in PrEP Uptake and Adherence Among AGYW

Despite recognising the benefits, HCPs highlighted significant barriers to PrEP uptake and adherence among AGYW. The level of PrEP awareness, misconceptions about the medication, relationship dynamics, PrEP regimen, side effects, pill burden, and the stigma associated with being on PrEP were prominent concerns.

Most HCPs identified a limited understanding of how PrEP works as a major barrier to PrEP uptake among AGYW. This lack of knowledge drives scepticism and weakens adherence. One HCP explained:

*"I think a lot of things that hindered adherence for a lot of our AGYW is that they didn't understand it, or they don't really understand what PrEP is or how it works." (*HCP 4)

Relationship dynamics significantly influence AGYW's adherence to PrEP. HCPs noted that pressure from partners or family members often leads young women to stop taking the medication, especially when they misunderstand its purpose. Some partners perceive PrEP as part of an ongoing research study rather than a preventive health measure, leading to resistance. As one HCP explained: *"They stopped taking PrEP because their partners don't want them to take PrEP. They say that this is research…they still think that we are researching the pill, not the behaviour."* (HCP 1)

Parental misunderstandings about PrEP cause many AGYW to stop using it. Most of the HCPs reported that parents often misinterpret PrEP's purpose and implications, creating conflicts that result in discontinuation. One shared:

"They actually have stopped taking the PrEP because the mother does not understand what PrEP is for what it does, what happens... She was put on product hold, and she wanted PrEP." (HCP 6)

Stigma emerged as a significant barrier to PrEP uptake. Several HCPs noted that the association of PrEP and antiretroviral treatment contributed to negative perceptions and fears of being judged. The lack of understanding about PrEP has led many to conceal their use of PrEP to avoid stigma, particularly from partners, family and the broader community. Some HCPs also pointed out how societal beliefs linking HIV to promiscuity further fuelled this stigma, thus discouraging AGYW from using and adhering to PrEP.

> *"...they have a problem with going with the container because it's written Truvada, stigma is an issue for them ...they have to explain to everyone that no, this is not an antiretroviral, it is something that is going to prevent me from getting HIV and then they have to hide the pill"* (HCP 1)

> *"...it's the risk of being ostracised and being judged because... they would associate it with HIV. So, you would then be stigmatised, and as much as we might think that now people are starting to get used to the idea of HIV-positive people... there is still HIV stigma."* (HCP 8)

Personal circumstances often disrupt AGYW's ability to take PrEP consistently. Common barriers include forgetting doses, experiencing emotional fatigue, and changes in relationship status. An HCP explained:

> *"...you find that someone was not at home ...she forgets it. Another one felt tired and didn't feel like taking PrEP, another one just broke up with the partner and doesn't see a need to take it anymore."* (HCP 3)

2.4.5 Cues to Action

To overcome barriers to PrEP uptake and adherence, HCPs emphasised specific cues to action that encourage adherence to PrEP. Encouragement and validation play a crucial role in motivating AGYW to continue their PrEP regimen. HCPs emphasised that positive reinforcement from healthcare workers significantly enhances adherence among AGYW. Compliments and praise help AGYW recognise the benefits of their treatment and feel supported in their health journey. One HCP noted:

> *"...when you compliment them, you know they appreciate it. At this age, they need to be complimented... saying, 'Oh, you have done well with your treatment,' so that they can see it's something that is going to benefit them."* (HCP 1)

Support systems, such as EMPOWER Clubs, significantly enhance PrEP adherence among participants, illustrating the dual nature of peer influence, where support fosters adherence while negative peer pressure undermines it. Discussions within these groups about PrEP intake and shared challenges motivate individuals to remain adherent. One HCP highlighted this impact:

> *"...them being able to discuss all of these things, including PrEP intake uptake and how other participants deal with the challenges... urges the other person to be more adherent."* (HCP 8)

However, negative peer influence can also present challenges, as adherence declines in group settings. Another HCP expressed:

> *"So, peer influence is a big thing…and adherence tends to be low in people who join as a group…If the Alpha says no, I am not taking my pills anymore, others then follow suit."* (HCP 4)

2.4.6 Self-Efficacy

Counselling plays a critical role in promoting PrEP adherence among AGYW, and HCPs recognise the importance of their self-efficacy in delivering this support effectively. They emphasised that receiving proper counselling training increases their confidence, empowering them to better address AGYW's unique needs and help them make informed health decisions. One HCP stated:

> "*...we need to get that counselling training ... we could do good in giving that counselling training because if we could get that... we are not going to be playing the roles of the counsellors."* (HCP 1)

Several HCPs also highlighted that individualised counselling is particularly important for ensuring adherence. They believe that one-on-one sessions allow them to address AGYW's specific concerns and create a personal connection, helping them overcome barriers like misconceptions, stigma, and external pressures. As one HCP explained:

> *"It comes down to like individual counselling that is the only way for me to really tackle it one on one… because if you tackle it as a group nobody ever identifies to say that could be me, but if you are now addressing what is going on in their lives like you bring it down to them and focusing on them because at that age you are very self-absorbed."* (HCP4)

2.5 Discussion

This secondary data analysis, guided by the Health Belief Model (HBM), reveals how AGYW perceptions and social contexts interact to influence oral PrEP uptake and adherence, highlighting a tension between empowerment and persistent barriers. Healthcare providers' insights indicate that although some AGYW recognise their susceptibility to HIV, their sense of urgency is often diminished by competing social expectations and norms. This reflects a gap between risk perception and action that complicates prevention efforts, consistent with observations from other high HIV burden settings where young women struggle to reconcile awareness with social pressures (26,32). Moreover, the widespread availability of antiretroviral therapy (ART) may lead AGYW to underestimate their risk, revealing a contradiction between perceived risk and actual vulnerability (33).

However, a critical barrier to PrEP uptake is AGYW's low perception of their HIV risk, which often hinders their willingness to adhere to the medication. When individuals do not perceive themselves to be at risk, they are less likely to engage in preventive health behaviours. Within the HBM, this is explained by the principle that individuals who lack perceived susceptibility to a health threat, such as HIV, are less inclined to take preventive measures (33).

Nevertheless, when AGYW perceive vulnerability within high-risk relationships, they are more likely to initiate PrEP use, demonstrating the nuanced ways in which perceived susceptibility shapes behaviour. These findings highlight the need for targeted urban campaigns that strengthen risk recognition, grounded in AGYW's lived realities, as suggested by HCPs and evidenced in other settings (16,17).

PrEP represents a critical tool for autonomy, empowering young women to exert control over their sexual health, particularly within relationships marked by power imbalances or coercion (16,17). Providers emphasised the value of peer-led programmes, such as EMPOWER Clubs, which foster supportive networks that motivate consistent adherence. This reflects the HBM's construct of cues to action, where peer support serves as a positive trigger for health behaviour adoption**.** Previous studies have shown that such initiatives motivate AGYW to adopt healthy behaviours, including consistent PrEP use (26,34,35). However, these same social environments can also propagate negative peer norms and misinformation, which undermine adherence (26,34). This contradiction between supportive peer spaces and peer pressure highlights the need for interventions that amplify positive peer influence while counteracting

harmful social dynamics. When combined with broader community education addressing stigma and gender norms, these strategies can create enabling environments that sustain PrEP use.

Stigma and misinformation create significant barriers to PrEP uptake and adherence. Providers described how AGYW often conceal their PrEP use to avoid being mistaken for HIV-positive or accused of infidelity, aligning with the HBM's perceived barriers construct (11,20–22). Partner opposition, gender norms, and relational power dynamics deter AGYW from disclosing or consistently using PrEP. These findings echo evidence from Kenya, Zimbabwe, and South Africa, where partner pressures, ranging from overt disapproval to subtle resistance, compel many young women to prioritise relationship harmony over personal protection (20,32,35). Montgomery et al. similarly found that lack of partner support leads women to hide or discontinue PrEP to preserve trust and avoid accusations of infidelity (36). This suggests that when perceived social risks outweigh the perceived benefits, AGYW may forgo PrEP altogether. Addressing this requires interventions that act as effective cues to action, not only through individual education but by engaging male partners, providing couple counselling, and reshaping community narratives around trust, fidelity, and women's autonomy (26,37).

From the provider perspective, challenges in delivering adolescent-responsive care were frequently noted. Limited counselling training and high workloads constrain the capacity to provide sustained adherence support in resource-limited settings. Providers reported that improved counselling skills enhanced their confidence and ability to support AGYW's health decisions, reflecting the HBM's self-efficacy construct, where provider confidence facilitates the delivery of tailored and sensitive guidance (14,25). Studies from Kenya, Tanzania, and Uganda show that such training, combined with task-shifting, improves provider-client rapport, eases workload pressures, and enhances PrEP uptake and continuation (16,17,26). Here, provider self-efficacy emerges not only as a motivational force but also as a determinant of care quality and a facilitator of adolescent trust (38).

The daily demands of AGYW's lives, including busy routines, emotional stress, and shifting relationship dynamics, further complicate adherence to a daily PrEP regimen, illustrating perceived barriers through practical and psychosocial obstacles to consistent preventive behaviour. These challenges align with a scoping review that identified daily life demands and psychosocial stressors as key impediments to PrEP adherence among AGYW in sub-Saharan Africa (39). Trust-based, provider-patient relationships can serve as critical cues

to action by reinforcing motivation and adherence (14). Positive reinforcement, such as acknowledging AGYW's efforts and providing encouragement, emerges as a powerful strategy to enhance adherence by strengthening self-efficacy and perceived benefits of PrEP use. Previous research supports this approach, demonstrating that positive reinforcement strengthens adherence to long-term health interventions by enhancing motivation and self-efficacy (38).

Building on these findings, qualitative research from Kenya highlights that strong provider-client relationships can enhance PrEP adherence among AGYW (14). AGYWs valued conversational, non-judgemental counselling where they felt genuinely heard and recognised as whole individuals rather than solely defined by their sexual behaviour. This approach fostered trust and a sense of control over their health decisions. Providers similarly emphasised the importance of empowering AGYW to reflect on their risk and make informed choices about PrEP. This rapport, grounded in empathy, confidentiality, and affirmation, was essential for sustained uptake and aligns with adolescent-friendly care principles (14).

This analysis demonstrates that focusing solely on individual risk perception is insufficient. Social environments and structural barriers, including poverty, stigma, and gender inequality, profoundly shape health behaviours and influence AGYW's ability to adhere to PrEP (10,20–22). When providers lack adequate training and resources, their capacity to deliver effective, adolescent-responsive care diminishes, particularly in overstretched health systems (16,17,25). Strengthening provider self-efficacy through comprehensive training and supportive work environments, alongside interventions that leverage positive reinforcement and peer support, remains critical for enhancing both service quality and sustained PrEP use among AGYW.

This study has several limitations. The secondary analysis is based on in-depth interviews with a small sample of nine healthcare providers purposively selected from the EMPOWER trial, a demonstration project focused on piloting PrEP delivery in a single urban subdistrict (Region F, Johannesburg). This limited scope and sample size may restrict the transferability of findings to other settings or diverse provider groups. Additionally, as a secondary analysis, the study relied on existing data, which may not have fully captured the breadth of provider experiences or emerging challenges in broader PrEP implementation contexts. Despite these constraints, the study provides critical insights into the challenges and facilitators of PrEP delivery during an early phase of implementation, offering a foundation for refining adolescent-responsive care and strengthening provider support in similar settings.

2.6 Conclusion

Healthcare providers in Johannesburg view oral PrEP as an important intervention that can empower AGYW to exercise greater control over their sexual health, particularly within relationships characterised by power imbalances. Persistent barriers, including stigma linked to PrEP's association with ART, misconceptions about HIV risk, and partner opposition, continue to hinder PrEP adherence. Peer support structures such as EMPOWER Clubs provide crucial motivation and social encouragement for consistent PrEP use, while tailored counselling delivered by providers helps foster trust and facilitates sustained adherence.

Providers demonstrate a strong commitment to youth-centred care, advocating for enhanced counselling training and broader implementation of peer-led support strategies to effectively address these barriers. These approaches offer practical avenues to enhance PrEP delivery and support AGYW in maintaining effective HIV prevention practices.

Although the EMPOWER study was conducted between 2016 and 2018 during the early phase of PrEP availability in South Africa, the insights remain pertinent as programmes scale up. Future research should explore the feasibility and impact of these interventions across diverse settings to inform ongoing efforts to optimise oral PrEP service delivery.

Competing Interest

The authors declare no conflict of interest. The views presented in this publication are solely those of the authors and do not necessarily represent the official position of Wits RHI.

Authors Contributions

NBG conducted all the analyses and was responsible for writing the manuscript. JW contributed to analysing the data and editing the manuscript. NK contributed to designing the primary qualitative study, collecting qualitative data, analysing the results, and editing the manuscript. All authors reviewed and approved the final manuscript.

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CHAPTER 3: EXTENDED METHODS

3.1 Introduction

This chapter outlines additional methods not discussed in the manuscript, focusing primarily on data management.

3.2 Data Management

The recorded interviews from the primary study were maintained following ICH GCP (International Conference on Harmonisation - Good Clinical Practice). During the study, the team securely stored documents on-site in locked cupboards or file cabinets within a restricted-access room. After collecting the data, the team transferred the documents to Microsoft Teams. Participants received information sheets, asked questions, and provided written or verbal consent to participate.

For this secondary study, the team stored and shared the transcribed datasets from the primary study in Microsoft Teams, limiting access to two supervisors, the Wits RHI team, and the researcher.

CHAPTER 4: EXTENDED RESULTS

4.1 Introduction

This chapter explores additional themes and insights that enhance understanding of HCP perspectives. Nightlife and alcohol emerge as significant risk factors for HIV infection, along with partner dynamics related to condom use, which fall under the theme of perceived susceptibility to HIV. The chapter also highlights perceived barriers to PrEP use and uptake, including the side effects of PrEP, challenges associated with daily dosing, and pill size. Furthermore, cues to action such as partner disclosure, alternative interventions, individual counselling, and efforts to reduce stigma through effective information dissemination play a critical role in shaping adherence.

4.2 Results

4.2.1 Perceived Susceptibility and Severity: HCPs' Views on AGYW's Risk of HIV Infection

- Perceived Susceptibility

Providers identified nightlife and alcohol consumption as behaviours that increase AGYW's risk of HIV infection. They explained that these behaviours impair decision-making, leading AGYW to engage in unprotected sexual encounters and transactional relationships with 'blessers'- older men who exchange material goods for sex with AGYW. One provider explained:

> *"Those that go to universities are exposed to going out at night, partying, and drinking alcohol... Once you are intoxicated, your judgment is clouded. That is where the 'blessers' take advantage… it's the lifestyle mostly; it's what makes the HIV risk high."* (HCP 6)

Another HCP emphasised the connection between partying and reduced condom use and reported: *"They love partying and alcohol, and I get a sense that condom use is not fashionable; it is not something they prioritise"* (HCP 7)

HCPs observed that AGYWs often face risks related to their partner's refusal to use condoms and fail to negotiate their use. This power imbalance prevents many AGYW from advocating for safer sex practices, increasing their vulnerability to HIV infection. One expressed the

general opinion stating, *"Sexual partners for these girls don't want to use condoms. They will tell you my partner does not want to use condoms."* (HCP 2)

Furthermore, many AGYW tend to follow their partners' choices not only regarding condom use but also in other aspects of sexual and reproductive health, such as seeking healthcare services. Another provider remarked:

> *"They don't like using a condom, and they tend to listen to their partners even more, so they need confirmation from their partners, especially if they want to come to the clinic."* (HCP 1)

Some HCPs observed that while some AGYWs recognise their risk, they do not take preventive steps such as consistent condom use, regular HIV testing, or initiating PrEP. Other AGYW understand their vulnerability because their partners are HIV-positive. This awareness motivates them to seek PrEP to protect themselves from HIV. One HCP stated:

> *"We have had a few that know that their partners are HIV positive. Yes, they want to take PrEP because they want to protect themselves and prevent HIV."* (HCP 2)

In contrast, some AGYW do not perceive themselves to be at risk due to a lack of knowledge.

> *"Truth is these girls are exposed to HIV, and they don't understand it; they don't see it that way. Although they will say I am with my partner, and I don't trust him… it is not something that they take seriously… they don't understand the consequences of that phase…"* (HCP 3)

- Perceived Severity

For AGYW in relationships where HIV risk is present, most HCPs observed that PrEP was viewed as crucial in preventing severe outcomes like HIV infection. Some AGYW actively sought to protect themselves from their partner's positive status: *"We have had a few that know that their partners are HIV positive…. They want to take PrEP because they want to protect themselves and prevent HIV*." (HCP 2)

4.2.2 Perceived Barriers to PrEP Uptake and Adherence

Misinformation and suspicion surrounding PrEP create significant barriers to its uptake among AGYW. Several HCPs highlighted that some AGYW are hesitant to use PrEP due to misinformation circulating among their peers, such as the belief that PrEP could transmit HIV

or cause harm. This leads to fear and hesitation about its safety and effectiveness. One HCP shared.

> *".. there were those who were saying, friends are saying…why are they taking PrEP ... are you not afraid that this PrEP that they are giving you will give you HIV..."* (HCP 3)

Another provider explained that unfamiliarity with PrEP further fuels scepticism *"Some of them when you go outside it's a new method, they don't even know about it, so they are a bit sceptical…others will think you are probably giving them HIV."* (HCP 1)

HCPs reached a consensus that AGYW often perceive themselves to be at low risk of contracting HIV despite risk factors mentioned earlier, such as being in multiple relationships, having unfaithful partners, experiencing sexual violence, and lacking the power to negotiate condom use. Although they may have some knowledge about PrEP, this perception diminishes their motivation to adhere, leading them to take the medication selectively.

> "*So, if you yourself think my chances of getting HIV are not actually that high, then it becomes difficult for you to take the pill every single day. That is why you will find that they will skip days … because they don't see the need to take it every single day."* (HCP 4)

Family dynamics create significant challenges for PrEP use among AGYW. Many parents don't understand what PrEP is, and AGYW often fear judgment or being labelled as promiscuous if they discuss using the medication with their parents or guardians. One HCP explained that parental concerns can pose a barrier:

> *"It's not their partners who don't want them to take the pills it's their parents.... who would say are you sexually active because you are saying that this is for the high-risk person, so you are telling me that you are a high risk you have more than one partner."* (HCP 1)

Even so, one HCP emphasised the need to educate parents and partners on the importance of PrEP.

> *"I think there are just a few whose parents do not want them to take PrEP, and they want us to explain to their parents what PrEP is and … the parents don't know about PrEP, they have never heard about PrEP, so probably just think…. we are experimenting with their kids."* (HCP 1)

Some HCPs underscored that even mild side effects, such as nausea and tiredness, can lead AGYW to stop taking PrEP. These side effects, though considered mild by healthcare standards, significantly impact young women's decisions to pause or discontinue use.

> *"... they start taking the tablet, then the side effects start kicking in and the side effects we classify them as mild but... if you were fine before you took a tablet and now, you're taking the tablet, and you've got nausea and you're feeling a bit tired."* (HCP 4)

Another HCP echoed this sentiment, *"...PrEP side effects a lot of them, especially when they have nausea, they just tend to be like no I will take it when I feel like it."* (HCP 1)

HCPs identified the large size of the PrEP tablet as a specific barrier to adherence among AGYW. They reported AGYW found the pill difficult to swallow and often asked whether it could be cut or crushed to make it more manageable. For many AGYW, who are not accustomed to daily medication, the tablet's size intensified the burden of maintaining a consistent dosing routine. Providers noted that this physical discomfort, combined with the broader challenge of daily pill-taking, contributed to PrEP fatigue.

> *"Others complain about the size of the pill because they ask if it is okay if I cut it in half or crush it but taking it every day that what is difficult."* (HCP 3)

> *"The size of the tablet that she has to take it every day it's tiring, and young people are not used to tablets, they don't get sick that often... This tablet is big; some people complain that I can't swallow tablets. I am not used to taking medication."* (HCP 6)

Additionally, a few HCPs observed that some AGYWs preferred alternative dosing options and would have chosen injectable PrEP over daily pills. They found injections more convenient and less burdensome, as they would reduce the need for daily commitment. One counsellor remarked

> *"For them it is hard... they even say if we were taking it at least once a week, or why can't you introduce injections because taking this pill every day is very tiring... They want to take it, they are trying it... but for them, it is not easy."* (HCP 3)

In addition to the burden of taking pills, AGYW face challenges in adhering to a specific regimen for PrEP due to their busy schedules.

> *"The challenge that they have with taking the pill is sticking to the time. Those that I have seen sticking to that one time will say they will take them at 8, next time she changes,*

maybe they knocked off late at school or at work so all those are the things that make not to stick appropriately." (HCP 6)

Logistical challenges, particularly the cost of PrEP and the frequency of clinic visits, were identified as significant barriers to PrEP uptake among AGYW. HCPs emphasised that the affordability of PrEP, especially when not subsidised by the government, could limit accessibility for many young women. Additionally, the need for frequent clinic or pharmacy visits to obtain PrEP was seen as impractical, potentially discouraging consistent use. As one HCP noted:

"I think the only thing that will be an issue of cost if it is not going to be supplied by the government… another thing will be how often will they have to come and get from the pharmacy." (HCP 5)

4.3.3 Key Cues to Action for PrEP Uptake and Adherence

The disclosure of PrEP use to partners emerged as an important cue to action. Observations indicated that when AGYW divulge PrEP usage to their partners, it often sparks increased interest in PrEP uptake within couples, creating a supportive environment for adherence. As one HCP explained:

"...I have found also that if you disclose it taking PrEP before you get the pill and you come with your partner-- some of them they come with their partners…the partner will give support because the partners will ask, are we not going to get PrEP also… why are you only giving it to the females?" (HCP 1)

Introducing alternative interventions, such as long acting injectables, could serve as significant cues to action for improving adherence to PrEP among AGYW. Acknowledging the challenges of daily adherence, one provider stated:

"We need something that they only need to take once in a while, so something like you know an injectable contraception like every three months or that will cover them for three months at a time or two months at a time but like the daily intake like using PrEP now for a while I think it gets a bit difficult." (HCP 4)

Reducing stigma through information dissemination was deemed essential for promoting PrEP use. HCPs suggested that making information about PrEP accessible in community settings could normalise discussions and encourage AGYW to seek PrEP. One HCP highlighted this

need: *"Information everywhere to the community taxi ranks, clinics, churches, where the people with influence can talk about it."* (HCP 6)

4.3.4 Enhancing AGYW's Self-Efficacy in PrEP Adherence

Some HCPs highlighted the positive impact that consistent and correct use of PrEP has on AGYW's confidence. They observed that when AGYW adhere to the medication regimen, they feel reassured about their protection against HIV, even in potentially risky situations. One HCP explained:

> *"It would make them confident. That even if such and such happens, they are okay if they take it correctly…it gives them that confidence that whatever may seem as a risk they will be protected, they will be safe from HIV."* (HCP 1)

Peer support has also helped AGYW build confidence in discussing their health choices and sexual health. One participant highlighted:

> *"It has helped them build their confidence to be able to talk about sex with their partners with their friends, not so much with their parents, but they do have the confidence now to say-- and to stand up for themselves and saying this is actually the decision that I'm making for myself."* (HCP 8)

CHAPTER 5. OVERALL DISCUSSION, LIMITATIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the study's extended findings and overall conclusions, focusing on HCPs' perspectives on factors influencing oral PrEP use among AGYW. It covers key issues such as perceived HIV susceptibility, barriers to PrEP uptake, and facilitators of adherence. It also examines the impact of risky behaviours, daily medication challenges, and the role of supportive interventions. Additionally, it explores the potential of injectable PrEP and identifies structural factors that affect access to and continuation of PrEP use. Based on these findings, the chapter offers recommendations for improving PrEP uptake and adherence while also highlighting gaps that could be addressed in future research, particularly in areas like intervention strategies, alternative PrEP methods, and structural barriers to access.

5.2 Discussion

The findings of this study provide critical insights into healthcare providers' perspectives on factors influencing oral PrEP use among adolescent girls and young women (AGYW). These perspectives revolve around core Health Belief Model constructs: perceived susceptibility to HIV, perceived barriers to PrEP uptake, and perceived benefits or facilitators of adherence. The results underscore how risky behaviours, challenges with daily medication adherence, and supportive interventions interact within these constructs to influence PrEP use.

A key insight is that HCPs recognise risky behaviour such as partying and alcohol consumption as significantly increasing AGYW's vulnerability to HIV. Within the HBM framework, alcohol use contributes to low perceived susceptibility and diminished self-efficacy in managing risk. Alcohol impairs decision-making and leads to unprotected sex and transactional relationships with older men who provide material things for sexual relationships, known as "blessers." This finding aligns with existing research demonstrating the strong link between alcohol use and risky sexual behaviour, particularly among young women (40,41). Moreover, alcohol use undermines PrEP adherence by increasing forgetfulness in taking daily doses, reducing its protective efficacy (40,41). This illustrates a tension within HBM: while AGYW may understand the threat of HIV (perceived severity), contextual factors such as alcohol create barriers that interfere with consistent preventive action.

The study also highlights how, despite heightened risk in contexts involving alcohol and "blessers," AGYW often have low perceived susceptibility in these settings, hindering PrEP uptake. Power imbalances with older partners further restrict their ability to negotiate protective measures like condom use or consistent PrEP adherence (10,23). This reveals contradictions within HBM constructs, high actual risk but low perceived susceptibility and low perceived control, underscoring the need for interventions that enhance empowerment and risk awareness. Accordingly, PrEP programmes should integrate community-based empowerment initiatives alongside risk communication tailored to urban youth cultures, addressing gender inequities and improving perceived susceptibility to HIV (22,39).

Interestingly, some AGYW actively seek PrEP when they are aware that their partners are HIV-positive, demonstrating that increased awareness of HIV risk in relationships motivates AGYW to take protective measures. This aligns with findings from other studies, which show that women who are aware of their partner's HIV-positive status are more likely to initiate PrEP (7). Additionally, studies conducted in Uganda, Zimbabwe, and South Africa indicate that uncertainty about partners' HIV status and fears of acquiring HIV due to partner infidelity contribute to heightened risk perception and subsequent PrEP uptake (26). Research in Malawi among AGYW similarly demonstrates that concerns over partners' unknown HIV status drive some young women to seek PrEP, underscoring how partner-related risk awareness can influence protective behaviours (42). HCPs also note that AGYW who understand the protective benefits of PrEP are more inclined to use the medication, viewing it as a crucial tool for HIV prevention.

Other studies in Uganda, Zimbabwe, and South Africa show that uncertainty about partners' HIV status and fears of acquiring HIV due to partner infidelity heighten risk perception and stimulate PrEP uptake (26). Similarly, research in Malawi highlights concerns over partners' unknown HIV status as a driver for PrEP use (42). These findings indicate that enhancing accurate risk perception through partner-related awareness can positively influence protective behaviours. HCPs also observe that AGYW who grasp the protective benefits of PrEP are more inclined to use it, reflecting the role of perceived benefits in health behaviour change.

Barriers to PrEP uptake, with side effects such as nausea and fatigue being the most reported reasons for discontinuation. Even mild side effects can deter adherence, particularly among young people who may be more sensitive to changes in their physical well-being (4,32). This points to the psychological burden of feeling unwell, even temporarily, which can discourage

AGYW from continuing the medication regimen, underscoring the need to better equip AGYW with the knowledge of managing possible side effects during PrEP counselling.

Another major barrier is the burden of daily dosing, especially for AGYW unfamiliar with regular medication use. Pill size and the discomfort associated with swallowing also present adherence challenges. These findings echo qualitative studies in Tanzania, Uganda, South Africa and Zambia, which highlight pill fatigue amid busy social lives as a substantial obstacle (26,43). These insights underscore the critical role that pill size and ease of swallowing play in supporting medication adherence (27). Given these challenges, alternative interventions like injectable PrEP emerge as a promising solution. Providers report interest among AGYW for injectable options that eliminate daily dosing and pill-related issues. Recent studies support injectable PrEP's potential to improve adherence through increased convenience and reduced daily burden (10,26,34). A Tanzanian study among female barmaids highlights key reasons for favouring injectable PrEP, including enhanced privacy, perceived efficacy via direct bloodstream delivery, and ease of use with monthly or quarterly dosing rather than daily (43).

Logistical barriers such as cost and frequent clinic visits, are also act as structural barriers. HCPs note that without government subsidies, the cost of PrEP could restrict access for many AGYW, and regular clinic or pharmacy visits may be impractical. This aligns with literature identifying transport and healthcare access as major determinants of PrEP uptake in resource-limited settings resource-limited settings (18,26,43). Such barriers highlight the role of external structural factors influencing health behaviours, which may not be fully captured by individual-level HBM constructs, but are critical to address through policy and system-level interventions.

In contrast, several factors act as facilitators of PrEP adherence. Peer support emerges as a critical factor, where peer discussions reinforce perceived benefits and self-efficacy, encouraging continued use (26,34,39). Additionally, partner disclosure serves as a key cue to action; AGYW who disclose PrEP use often receive increased emotional and practical support, facilitating adherence (44,45). Evidence shows that partner involvement can further enhance uptake and adherence. In Malawi, male partners supported pregnant women by giving reminders, using discreet public signals, and offering verbal encouragement, which improved adherence (46). The HPTN 084 study in sub-Saharan Africa found that disclosing PrEP use to partners fostered supportive dynamics, with emotional and financial backing(47). However, fear of stigma and judgment frequently results in non-disclosure, a barrier aligned with perceived social costs within the HBM. This fear, linked to stigma around HIV, deters disclosure and negatively impacts adherence(35,40). These dynamics suggest that interventions

involving partners, peers, and families, alongside community-level stigma reduction, could foster safer disclosure environments and improved adherence.

Providers emphasised the need for personalised counselling to address AGYW's unique concerns, such as stigma or side effects, thereby improving PrEP adherence. Tailored, empathetic approaches are shown to be effective in Uganda and Kenya(14,40), though provider biases may hinder counselling quality in some settings (17). This highlights the importance of provider training to enhance perceived benefits of counselling and reduce barriers related to provider attitudes.

Finally, reducing stigma through information dissemination is critical to promoting PrEP use. Providers recommend making PrEP information accessible in community settings, such as clinics, taxi ranks, and churches, to normalise HIV prevention conversations and encourage uptake. A multi-country study in Uganda, South Africa, and Zimbabwe supports community engagement and education as facilitators that reduce stigma and overcome PrEP uptake barriers (26). Extending this, our findings highlight taxi ranks as novel outreach venues within Johannesburg's urban youth culture, effectively addressing low-risk perception and misinformation. This supports the integration of individualised counselling with community-based stigma reduction strategies to enhance PrEP uptake and adherence among AGYW.

5.3 Limitations

This study has several limitations. The analysis was based on a small, purposively selected sample of nine healthcare providers involved in a single PrEP demonstration trial. As such, the findings may not be transferable to other settings. While the aim was to generate formative insights into an underexplored area rather than to generalise, the limited sample size may have excluded broader provider perspectives. The use of secondary data also introduced constraints, as the original interviews were not conducted with this specific research question in mind, and opportunities to probe emerging themes were limited. Although data saturation was observed within the selected sample, this may not reflect the full diversity of experiences across different settings. In addition, the study did not explore broader health system-level factors such as infrastructure, training, or policy, which may also influence PrEP delivery. Future research should consider these systemic dimensions to develop a more comprehensive understanding of provider-level challenges.

5.4 Conclusion

This study explored healthcare providers' perspectives on the provision of oral PrEP to AGYW in Johannesburg. The findings reveal that HCPs viewed oral PrEP as a tool of empowerment, enabling AGYW to exercise greater control over their sexual health, particularly in circumstances marked by unequal power dynamics or intimate partner violence. However, HCPs consistently reported that AGYW's low perception of HIV risk, compounded by stigma, misinformation, and opposition from parents or partners, posed significant barriers to both uptake and adherence. Peer support emerged as a double-edged factor: while positive encouragement from peers and EMPOWER Clubs motivated PrEP adherence, negative peer pressure undermined sustained use. Practical challenges, especially the burden of daily pill intake and side effects, further limited adherence, with many AGYW expressing a preference for injectable PrEP as a more convenient and acceptable option.

Taken together, these findings underscore the importance of tackling both behavioural and structural barriers through interventions that enhance awareness of HIV risk, address stigma and misconceptions, involve families and partners, and expand access to alternative PrEP formulations. Strengthening HCP training and adolescent-responsive counselling remains essential to supporting AGYW effectively. Ultimately, by addressing these barriers while leveraging facilitators such as positive peer support and partner involvement, PrEP can reach its full potential as an empowering HIV prevention tool for AGYW in high-prevalence contexts.

5.5 Recommendations

The following recommendations are drawn from the perspectives of healthcare providers who participated in this qualitative study. While they provide important insights into potential strategies for improving PrEP uptake and adherence among AGYW, they should be interpreted as exploratory rather than prescriptive. Broader implementation requires further research and piloting to establish feasibility and sustainability.

5.5.1 Comprehensive Education and Training for Healthcare Providers

Healthcare providers, community health workers (CHWs), health promoters, and counsellors should receive targeted training to strengthen their ability to deliver youth-friendly PrEP services. Training should cover both oral and injectable PrEP, which has since been introduced as a viable alternative to the daily oral regimen that AGYW themselves identified as a preferred option. Training should also include communication skills, stigma reduction strategies, and an

understanding of the psychosocial and cultural factors that influence adherence. Individualised counselling should be continuous, ensuring AGYW are supported throughout their PrEP journey and addressing issues as they arise. A collaborative, team-based approach, supported by task-shifting to cadres such as CHWs and health promoters, as seen in Uganda (26), can reduce workload pressures while ensuring consistent, accurate information and improved service delivery.

5.5.2 Addressing Misinformation, Stigma and Relationship Dynamics

Stigma, misconceptions, and family or partner dynamics remain key barriers to PrEP uptake. Common myths, such as PrEP being confused with ART or causing HIV, discourage AGYW from using PrEP. HCPs should provide clear, evidence-based information about PrEP during consultations, community outreach activities, and through educational materials, while also engaging families and partners in sensitisation campaigns, counselling, and community dialogues. Offering educational sessions or counselling can reduce stigma and build a supportive environment that encourages AGYW to initiate and continue PrEP. Involvement from partners can address relational dynamics by providing emotional support (36), while normalising conversations about PrEP within households can reduce shame and judgment (37).

5.5.3 Enhancing Peer Support Systems

Peer-led initiatives, such as EMPOWER Clubs, should be expanded to foster cues to action and self-efficacy, countering stigma and negative peer influence, as HCPs observed improved adherence through peer discussions. Positive peer influence, particularly through peer-led initiatives, has been shown to encourage consistent use of PrEP (26,34). On the other hand, negative peer pressure can discourage adherence. CHWs and health promoters can facilitate peer-led initiatives, such as community-based support groups, to foster accurate information sharing and healthy behaviours. These platforms can help address negative peer-driven attitudes and reinforce the benefits of adherence.

5.5.4 Improving Accessibility and Convenience

Accessibility to PrEP remains a significant challenge, particularly with oral PrEP's daily dosing regimen, which some AGYW find difficult to maintain. Decentralised and youth-friendly delivery models, such as mobile clinics or youth-friendly service corners, could improve uptake and adherence, especially in rural or underserved areas (26,48). Offering injectable PrEP as an

alternative for those who struggle with daily pills provides an additional option for AGYW who face logistical or emotional barriers to oral PrEP. While HCPs may have limited influence over policy-level decisions, they can play an important role in promoting convenient access within their facilities, referring AGYW to services with the resources and capacity to provide PrEP, including mobile clinics, and collaborating with community-based organisations to expand reach.

This research remains relevant as it shapes HIV prevention strategies for AGYW. Understanding HCPs' views on PrEP use and risk factors drives improvements, especially with new PrEP innovations, ensuring effective, youth-friendly interventions.

5.5.5 Further Research Recommendations

To enhance the provision of PrEP to AGYW, future research should prioritise addressing the knowledge and practice gaps among healthcare providers. Exploring systemic barriers, such as insufficient infrastructure, policy constraints, and limited training opportunities, will provide critical insights into how these challenges impact the effectiveness of PrEP delivery. Research focusing on these health system-level factors will help identify strategies to strengthen support for HCPs and improve service delivery.

The complex role of peer influence on PrEP uptake and adherence among AGYW also warrants deeper investigation. While peers can encourage positive behaviours, they can also perpetuate stigma or misinformation. Future studies should examine the design and implementation of peer-led interventions that HCPs can incorporate into their practices to harness the benefits of peer support while addressing potential risks.

Furthermore, the role of family and partners in influencing PrEP adherence needs further exploration. Research on how to actively engage families and partners in the PrEP decision-making process could provide actionable strategies for reducing stigma and fostering supportive environments. Investigating tailored approaches for integrating family and partner counselling into healthcare services will equip providers with tools to better support AGYW in adhering to PrEP.

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48. Rousseau E, Sikkema KJ, Julies RF, Mazer K, Heffron R, Morton JF, et al.Exploring adolescent girls and young women's PrEP-user profiles: qualitative insights into differentiated PrEP delivery platform selection and engagement in Cape Town, South Africa. J Int AIDS Soc. 2024 May;27(5):e26254. doi: 10.1002/jia2.26254. PMID: 38695101; PMCID: PMC11063778.

7 APPENDICES

7.1 Appendix 1: University of Witwatersrand Plagiarism Form

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Nomthandazo Blessings Gwebu (Student number: 2578820) am a student registered for the degree of MPH SBCC in the academic year 2025.

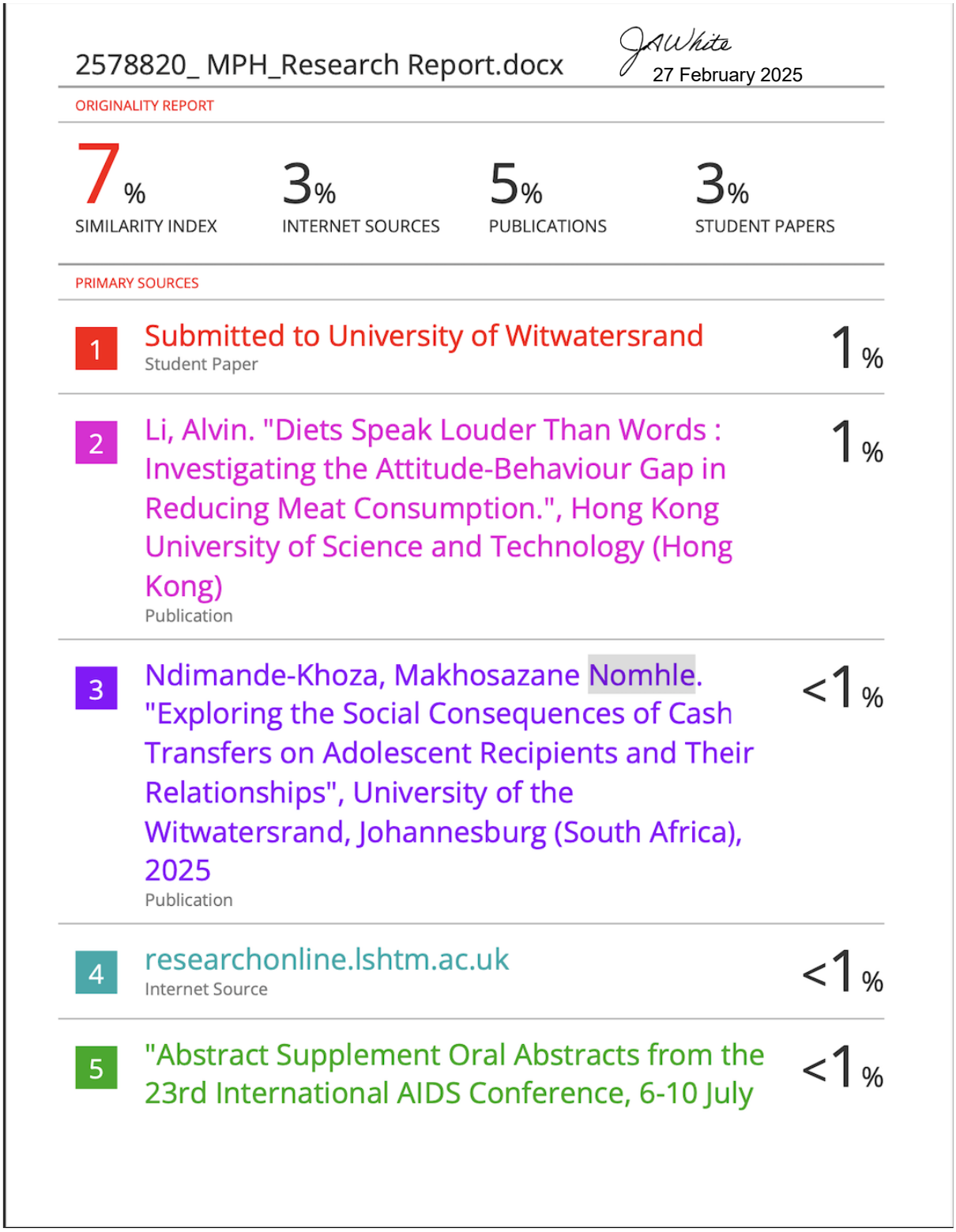
I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature: _____ Date: 22 September 2025

1

7.2 Appendix 2: Turnitin cover page



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27 February 2025

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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3	Ndimande-Khoza, Makhosazane Nomhle. "Exploring the Social Consequences of Cash Transfers on Adolescent Recipients and Their Relationships", University of the Witwatersrand, Johannesburg (South Africa), 2025 Publication	<1%
4	researchonline.lshtm.ac.uk Internet Source	<1%
5	"Abstract Supplement Oral Abstracts from the 23rd International AIDS Conference, 6-10 July	<1%

7.3 Appendix 3: Ethics clearance certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R49 Ms NB Sibanda

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M240432

NAME: (Principal Investigator)	Ms NB Sibanda	**DEGREE:** MPH
DEPARTMENT:	School of Public Health Medical School	
TITLE:	*Exploring healthcare providers' perspectives and experiences in the provision of oral PrEP for adolescent girls and young women in Johannesburg, South Africa*	
DATE CONSIDERED:	19 April 2024	
DECISION:	Approved unconditionally	
CONDITIONS:		
NOTE:	If contact information regarding student study participants is required, please contact the Registrar's office <Nicoleen.Potgieter@wits.ac.za>	
SUPERVISORS:	Drs J White and N Ndimande-Khoza	
APPROVED BY:	Professor P Ruff, Chairperson, HREC (Medical)	

DATE OF APPROVAL: 14 June 2024 **EXPIRY DATE:** 13 June 2029

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report** in the format available at https://wits.ac.za/research/researcher-support/research-ethics/ethics-committees/. This report is due annually, for the duration of the Clearance Certificate, beginning on the first anniversary of Date of Approval above. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator — Date: 7 August 2024

7.4 Appendix 4: Journal of the International AIDS Society guidelines for authors

Manuscript title

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Commented [A2]: List authors here. E.g. John P. Smith.

Commented [A3]: E.g. Mary J. Collins

Commented [A4]: E.g. Bob T. Lee

1 Department, Institution, City, Country
2 Department, Institution, City, Country
3 Department, Institution, City, Country

Commented [A5]: Details of authors' affiliations. E.g. Department of Child Health, General Hospital, New Delhi, India

§ Corresponding author: FirstName MiddleName LastName

Commented [A6]: E.g. Bob T. Lee

Street Name
City, Postal Code, Country
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Abstract: xx/350

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Main text: xx/3500

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Abstract:
Headings: Introduction, Methods, Results, Conclusions
Word limit: 350 words

Main text:
Headings: Introduction, Methods, Results, Discussion, Conclusions
Word limit (quantitative): 3500 words; tables do not contribute to the word count
Word limit (qualitative): 5000 words if the manuscript includes substantial quotes; tables with quotes contribute to the word count; mixed and multiple methods reports may be included if there is a qualitative component with quotes
Numbers of figures and tables: Unlimited
Additional files: Yes

Abstract

Introduction: Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso carinae ad supremos usque carbasos aedificet onerariam navem.

Methods: Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso carinae ad supremos usque carbasos aedificet onerariam navem omnibusque armamentis instructam mari committat.

Results: Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso carinae ad supremos usque carbasos aedificet onerariam navem omnibusque armamentis instructam mari committat.

Conclusions: Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso.

Clinical Trial Number: xxxx

Word Limit: 350 words

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Introduction

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Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis [1]. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso carinae ad supremos usque carbasos aedificet onerariam navem omnibusque armamentis instructam mari committat [2].

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Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso.

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Methods

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Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi.

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Subheading

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem.

Subheading

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso.

Results

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso (Table 1).

Table 1. Title of Table

Variable	Number
Characteristic 1	1*
Characteristic 2	10
Characteristic 3	100
Characteristic 4	1000

Legend of table: *explanation here

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso (Figure 1).

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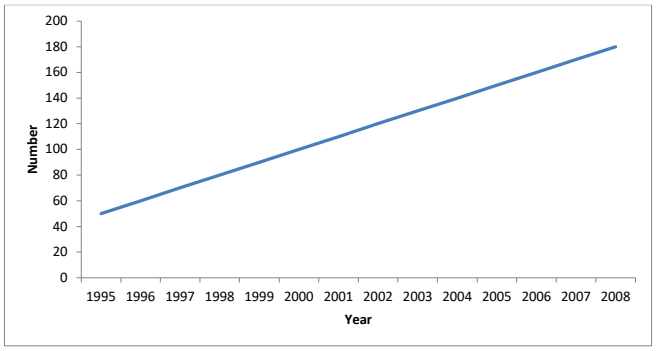

Figure 1. Title of Figure. Brief description of figure here.

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Discussion

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso.

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Conclusions

Cyprum itidem insulam procul a continenti discretam et portuosam inter municipia crebra urbes duae faciunt claram Salamis et Paphus, altera Iovis delubris altera Veneris templo insignis. tanta autem tamque multiplici fertilitate abundat rerum omnium eadem Cyprus ut nullius externi indigens adminiculi indigenis viribus a fundamento ipso.

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Competing interests [Mandatory]

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Authors' contributions [Mandatory]

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Author information [Optional]

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References

1. Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002 Jul 25;347(4):284-7.

2. Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, et al. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. Brain Res. 2002;935(1-2):40-6.

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