

# Assessing HIV Pre-exposure Prophylaxis Uptake and Retention Amongst Young Females in Gauteng Province

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## Contributions

Author 1, Prepared the original manuscript draft; 1,2,3 and 4 reviewed and edited manuscript. All authors approved the final manuscript.

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## Abstract

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Although roll-out of HIV pre-exposure prophylaxis (PrEP) has been reported to have changed contexts of HIV risk in areas where it was well-implemented. The rate of its uptake and retention amongst young females has not been described in Gauteng Province. This paper aimed at assessing PrEP uptake and retention among young females in Gauteng Province. Total of young females who tested HIV across five clinics from 01/January/2017 to 31/December/2020 was 19,671 with 17,937 tested HIV negative. Of the HIV tested negative, PrEP was initiated to 1307 (7%). The analysis revealed that 27% of young females returned for their first follow up visit after PrEP initiation, while third month declined to 14%, fourth month to 11%, and fifth month to 3%, sixth month to 2% and seventh month at 1% and from the eighth month, the rate of follow up was 0%. Uptake and retention of PrEP was low among young females as measured against the total tested HIV negative.

**Keywords:** Assessing · HIV pre-exposure prophylaxis · Uptake · Retention · Young females

## Introduction

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Pre-exposure prophylaxis (PrEP) is an HIV prevention programme made of tenofovir (TDF) and emtricitabine (TDF) combined in one pill, taken orally once a day [1]. Uptake is described as the number of young females who decided to be initiated on PrEP while retention is those initiated on PrEP, took it continuously, compliant with the follow-up care while still at risk of HIV infection [2]. The United States Food and Drug Administration (US-FDA) approved PrEP in 2012 and in May 2014, the Centre for Disease Control and Prevention (CDC) released the clinical guidelines indicating eligible patients, prescription guide, and management of PrEP [3, 4]. Additional to that, in 2015, World Health Organization (WHO) advised that those who are at increased risk of HIV and are eligible, must be given PrEP pill.

Although PrEP is approved and highly effective as an HIV prevention intervention, its' uptake and retention has been low globally, mainly in key population such as young females [5, 6]. Furthermore, [5] reported that, despite PrEP being implemented in many countries globally, total active patients are below the target. Weinstein et al. [7] concurred and reported that, despite the target set by CDC indicating that 1.2 million people must be on PrEP in 2015, only 125 000 active prescriptions of PrEP was recorded in 2017 in the United States of America (USA). This indicates that, the CDC's target for PrEP uptake and retention has not been met. Low PrEP uptake and retention has been reported in many countries, including African countries [8, 9]. This low PrEP uptake and retention indicates a global public health challenge that needs to be addressed.

Low performance in PrEP uptake and retention among young females contribute significantly to 25% of new HIV incidences amongst the vulnerable populations globally [10,11,12]. In Southern Africa, it has been indicated that despite young females representing only 10% of the total population, they account for 30% of the total new HIV infections [10]. Furthermore, the United States Agency for International Development (USAID) concurred and reported 340,000 new HIV cases amongst young females and fifty (50) adolescent girls died from AIDS-related sicknesses daily in 2017 [10]. Young females have continued to account for the high rate of new HIV infections because not enough opportunities are offered to them to decide on their sexually related health issues, aggravated by gender inequalities and or intimate partner violence blocking them from protecting themselves against HIV [10, 13, 14]. This implies that, females are more at risk of HIV and high PrEP uptake and retention for them, may assist in the battle to flatten the curve of new HIV infections.

In 2016, South Africa (SA) employed a phased approach for the rollout of PrEP and the rollout was expanded to different primary healthcare centres in 2017 for all populations at risk of HIV, such as young females. Despite the availability of PrEP in many clinics, the online reported data on SA PrEP watch which was updated on the 15th of October 2021 indicated 160,000 to 165,000 current PrEP users. However, the set target by President's Emergency Plan for AIDS Relief (PEPFAR) for SA country operational plan 2021 stated that 250,020 PrEP users by the end of financial year 2021/2022. This indicates that, SA is far behind achieving this target.

There is, therefore, the need to assess the PrEP uptake and retention among young females in Gauteng province. Should it happen that this gap is not addressed through research, the province might continue with poor performance, unrecorded and missed on the benefit of PrEP, while young females are dying from HIV/AIDS related illnesses daily. Findings from this study will provide the statistics for PrEP uptake and retention in Gauteng and will further help the Department of Health to develop the plan of action, based on the findings. It will also determine how far or how close the Gauteng province is to the UNAIDS target. The UNAIDS target is to reach less than 200,000 HIV incidence of young females by end of 2030. Based on the above, the researchers were of the view that, it is necessary to assess PrEP uptake and retention among young females in Gauteng province.

## Methods

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This paper utilised quantitative descriptive design to assess PrEP uptake and retention among young females at Gauteng province. Retrospective patient record audits were conducted to assess records for young females aged 15 to 24 years from 2017 to 2020 consecutively. Self-developed data collection tool was used to collect data from each clinics' health records. The records that were within the period of interest were retrieved to assess PrEP uptake and HIV testing register, District Health Information Software and PrEP Tier.net were the data source. These records reported total of young females who tested HIV, tested HIV negative, offered, and accepted PrEP. While PrEP retention data was collected from young females' files which were retrieved randomly until the 30% sample size representation was met from the total initiated on PrEP (2017–2020). Data gathered from young females' files included pre and post PrEP initiation counselling documentation, duration of months on PrEP, total of those who stopped PrEP, reasons of stopping, those who declined PrEP and their reasons. Demographic data collected from young females files included age, marital status, occupation, level of education, religion, referred from the other health care establishments or came to the clinic voluntarily from home, risk of Intimate Partner Violence (IPV). Both PrEP uptake and retention data was collected from 1st of September to 29 of October 2021 considering the five clinics.

These five clinics are situated in the townships of Gauteng province and are community health centres which implies that they are high volume clinics. They are the first to implement PrEP in this province in 2017 as South Africa adopted phased implementation. They all render comprehensive primary health care services for all ages from Monday to Friday (7h00 to 16h00) and on Saturdays they render services from 07h00 to 13h00. While emergency care, midwife obstetric and accident unit opens seven (7) days a week, operating 24 h a day at no monetary charge. The total population served in these clinics was 72 036 according to Johannesburg Health District Web-DHIS reported on the 31st of November 2021. HIV services are provided by counsellors and nurses, while Doctors only refer patients for HIV services to nurses and counsellors. PrEP information is provided by nurses, health promoters and counsellors.

To ensure content validity, only measures relevant to the study were included in the data collection tool [19]. Before development of the data collection tool, literature on corresponding subjects, which included PrEP roll-out or introduction, and implementation guidelines, was conducted to compile accurate questions to collect quality data. The tool developed was pre-tested before the main data collection to ensure that it measured what it was intended to measure. This study protocol was approved by the University of Pretoria ethics committee, ethics reference number: 244/2021, approval was also obtained from Johannesburg health district research committee reference number: GP\_202107\_007 and specific clinics' facility managers voluntarily signed consent forms to give access to health records.

## Statistical Analysis

The dependent variables included PrEP uptake and retention while independent variables were described as origin that young females presented from, in the clinic, either referred or from home, age, risk of Intimate Partner Violence (IPV), marital status, post PrEP initiation counselling and reasons of accepting PrEP. Proportions of PrEP uptake versus total tested HIV negative across five clinics are presented in Table 1 below. This analysis indicate a clear evidence that there is low PrEP performance across the five (5) clinics from 2017 to 2020 with the average proportion of 8.79%. From the presented data, the lowest was clinic A on PrEP uptake which has a proportion of 4.16% and the highest was clinic E on PrEP uptake with proportion of 15.41%. Additional to that, proportions, standard error and associated 95% confidence intervals of independent variables for young females who returned on month two after PrEP was initiated was determined across five clinics measuring level of PrEP retention (Table 2).

Moreover, the level of association between dependent and independent variables was determined using chi-squared test, reporting fisher's exact, 1-sided fisher's exact, associated 95% confidence interval, standard error and the P-value. The level of association between PrEP retention and independent variables which included age, marital status, IPV risk, origin of young females presenting at the clinic for follow-up, reasons for accepting PrEP and post PrEP initiation counselling is summarized below.

The fisher's exact and 1-sided fisher's exact reported the P-value of 0.000 indicating high level of association between: origin, age, IPV risk, post PrEP initiation counselling Versus PrEP retention. The analysis indicated that, majority of young females presenting were from home while those who were referred were unlikely to come back. Young females age group 20 to 24 years were more likely to come back for their follow up care while age group between 15 to 19 years were unlikely to come back. All those who experienced IPV did not come back for their PrEP follow up. All those who received post PrEP initiation counselling came back for their follow up care in PrEP while those with no record of counselling did not. The P-Value of 0.05 was reported between marital status and PrEP retention, indicating less association. Additional to that, 0.03 P-value was reported between reason for accepting PrEP and young females returning for follow up after PrEP initiation indicating less association. This indicated that not all the independent variables are highly association with dependent variable described above.

**Table 1.** Proportions of PrEP uptake across five clinics from 2017 to 2020:

Clinics	Total tested HIV negative	Total initiated on PrEP	Propotion(%)
Clinic A	4488	187	4.16
Clinic B	4792	215	4.49
Clinic C	4034	463	11.48
Clinic D	3851	323	8.39
Clinic E	772	119	15.41

**Table 2.** Proportion, standard error and associated 95% confidence intervals for independent variables of young females who “Came back Month 2”

Independent variables of young females who “Came back Month 2”	Proportion	Std. Err	[Associated 95% Conf. Interval]	
<b>Origin</b>				
Home	0.85	0.03	0.773	0.905
Referred	0.15	0.03	0.095	
<b>Age</b>				
15–19	0			
20–24	1	0	–	–
<b>Reason for accepting PrEP</b>				
At risk of HIV	0.55	0.05	0.459	0.642
Boyfriends refuse to use condom	0.39	0.05	0.300	0.479
Do not trust the boyfriend	0.01	0.01	0.001	0.061
Multiple sexual partners	0.05	0.02	0.024	0.113
<b>Post PrEP counseling</b>				
Yes	0.11	0.03	0.060	0.177
Not documented	0.89	0.03	0.828	0.939
<b>Marital status</b>				
In a relationship	0.95	0.02	0.887	0.976
Open relationship	0.05	0.02	0.024	0.113
<b>IPV risk</b>				
Yes	0.0			
Not documented	1	0	–	–

## Results

The total tested HIV across five clinics was 19,671, tested negative was 17,937 which is 91% of the total tested. PrEP was initiated to 1307 of the tested negatives which is 7% across five clinics. Specific to each clinic, Clinic A, a total of 4903 tested HIV and 4488 tested HIV negative, which is 92% of the total tested, and PrEP was initiated to 187 young females which is 4% of the total tested HIV negative. Clinic B, a total of 4949 tested HIV and 4792 tested HIV negative, which is 97% of the total tested, and PrEP was initiated to a total of 215 young females which is 4% of the total tested HIV negative. Clinic C, a total of 4383 tested HIV and 4 034 tested HIV negative, which is 92% of the total tested, and PrEP was initiated to a total of 463 young females which is 11% of the total tested HIV negative. Clinic D, a total of 4 387 tested HIV and 3 851 tested HIV negative, which is 88% of the total tested, and PrEP was initiated to a total of 323 young females which is 8% of the total tested HIV negative. Clinic E, a total of 1 049 tested HIV and 772 tested HIV negative, which is 74% of the total tested, and PrEP was initiated to a total of 119 young females which is 15% of the total tested HIV negative.

Of the 1307 young females initiated on PrEP, 416 files were audited representing 30% sample size. The distribution of files audited for 4 years (2017–2020) across five clinics is presented in Fig. 1. The descriptive data from the 416 patient files audited included age, 199 files were for young females age  $\geq 15$  to 19 while 212 was for those aged  $\geq 20$  to 24 years. 416 of them were in a relationship, with 102 experiencing IPV while 314 had no record of IPV. According to the records, 105 was referred from other clinics and 315 came from home without referral. Additional to that, this study further gathered data on reasons stated on young females' files on why they accept PrEP. Of the 416 young females, majority state that they were at risk of HIV ( $n = 261$ ; 63%), followed by those who stated that the boyfriend refuses to use condom ( $n = 102$ ; 26%), followed by those having multiple sexual partners ( $n = 38$ ; 9%) and those who do not trust the boyfriend ( $n = 8$ ; 2%). Furthermore, PrEP retention was determined by measuring number of young females who came to the clinic from the first month of PrEP initiation until the 12th month post initiation as demonstrated on Fig. 2 below. Additional to that, reasons stated on the young females' files for stopping PrEP were also determined and the following are reasons noted. Parents do not approve ( $n = 1$ ; 0%), not at risk anymore ( $n = 11$ ; 3%), ART-HIV stigma ( $n = 49$ ; 12%), experiencing side effects ( $n = 79$ ; 19%), while 276 did not come for their follow-up visit representing 66%. The in-depth discussion on these results follows on the section below.

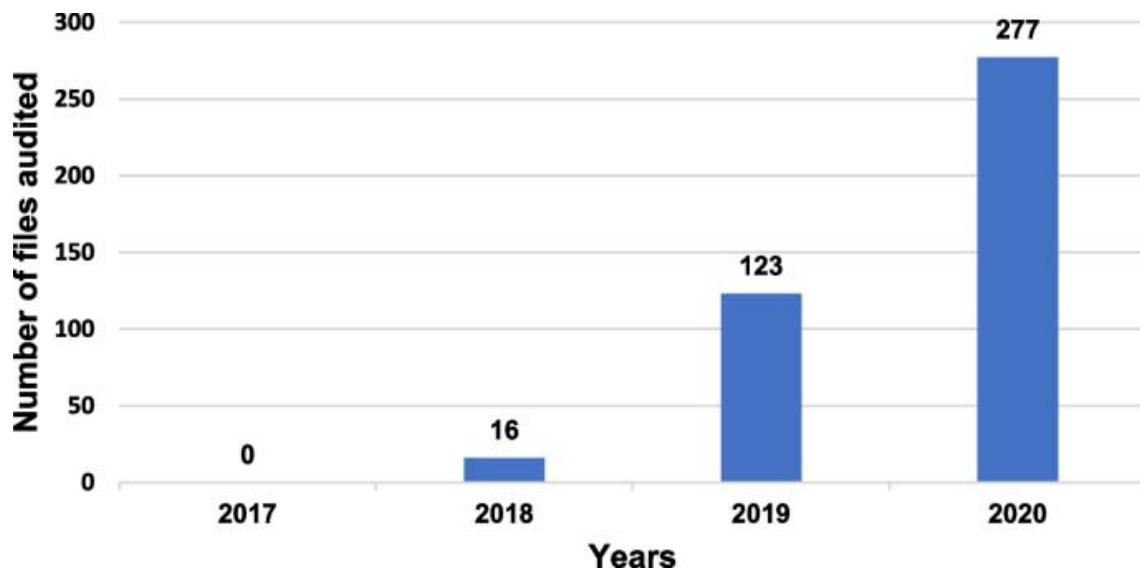


Fig. 1. Distribution of 416 files audited for 4 years (2017–2020) across five clinics

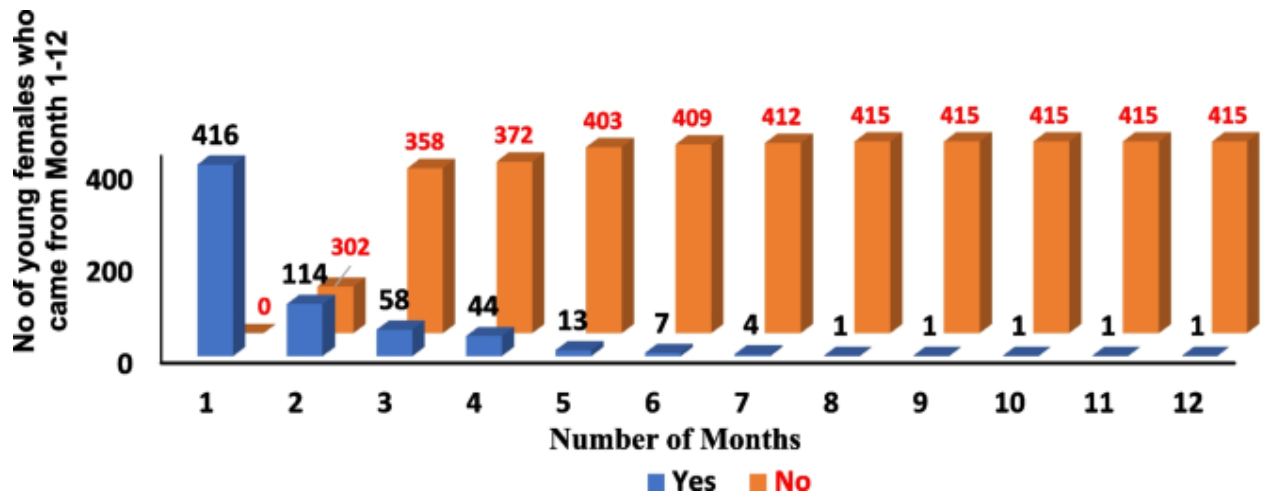


Fig. 2. Young females' who came back from month 1 to month 12 after PrEP initiation

## Discussion

### PrEP Uptake

This study found that out of 91% of total tested HIV negative for the period of 4 years (1st of Jan 2017–31st of Dec 2020) only 7% were initiated on PrEP across the five clinics. Clinic A and B accounted for the lowest performance of 4% initiated on PrEP from the total tested HIV negative while clinic E accounted for the highest performance with 15% of the total tested negative initiated on PrEP. From both clinics accounting of either the lowest or the highest percentages initiated on PrEP from the total tested HIV negative, the uptake is still low than expected, as stated by the set targets. These results are consistent with the study by [21] which reported that amongst sex workers who were offered PrEP, only 15% were initiated on oral PrEP. The results indicated that there are patients who agreed to initiate on PrEP although they accounted for a low percentage. This could be attributed to the reason stated on the patients' files that 63% of young females perceived themselves to be at risk of being HIV positive, while 26% with boyfriends refusing to use condoms, 9% having multiple sexual partners and 2% who do not trust the boyfriend. This is similar to the reasons [21] discovered while collecting data on factors influencing PrEP initiation amongst sex workers with 48% recognising their risk of HIV [21].

### PrEP Retention

The meaning drawn from young females who came back from month 1 to month 12 after PrEP initiation is that PrEP uptake can be high at the first visit, however the retention decreases drastically up to 0%. Similarly, [22] indicated that PrEP uptake was high at initial visit, however those at an increased risk of HIV such as adolescent girls had low retention. The study by [22] recommended that, to optimise retention, research on basis for PrEP discontinuation must be done.

The present study documented basis of PrEP discontinuation, as recommended, and stated that 19% of patients who were initiated came back reporting side effects and as a result, they stopped PrEP and did not continue, despite the information given. Other reasons include the ART-HIV stigma (12%), mainly because the PrEP pill is made of two Anti-Retroviral drugs (emtricitabine and tenofovir) which can easily be mistaken to be ART for HIV positive patients. Some young females stated that they are not at risk of HIV anymore, accounting for 3% which could be associated with their relationship status. Mainly because they may perceive themselves as not at risk of HIV because they are now single and not in a relationship, with no reason to continue taking PrEP. The files that had no record which indicate young females' visit accounted for 66%, thus the reason why they stopped taking PrEP was not documented. According to [1], many patients who are healthy, often do not prioritise prevention health service visits. These are potential reasons for those who did not present at the clinic from the 2nd to the 12th month following PrEP initiation. Young females aged 20 to 24 years accounted to 52% while 15 to 19 years accounted for 48% of PrEP initiation. However, 59% of those who presented at the first follow-up was from the age group 15 to 19 years while 39% was from 20 to 24 years. Notably, young females age 15 to 19 years returned for their first follow-up following PrEP initiation. This might be attributed to an increased rate of intimate partner violence amongst young females between the age of 20 to 24 (70%) that account for the low rate of PrEP retention (39%). In addition, the level of association between dependent and independent variables was assessed and analysis indicated that, origin, age, IPV risk were highly associated with PrEP retention while marital status and reason for accepting PrEP were not.

According to [4], there is no golden standard to measure retention in care, however, recommends one clinic follow-up visit quarterly (3 months), following the initial visit. However, the present study looked back on the [4] retention rate criteria and discovered that, young females who were not retained in PrEP would have been considered retained in care if the criteria was used, which is not a true reflection in a real life setting as per the PrEP guidelines. Wu et al. [23] concurred and stated that, PrEP must be taken for at least twenty-eight (28) days uninterruptedly following the last high risk HIV exposure to receive the maximum protection from PrEP, this implies that when one interrupt the 28 days of taking PrEP pill, it reduces the level of protection to acquire HIV.

### **Limitation**

Due to the lack of well-established data management system around PrEP, the files of those who declined PrEP was not found since such information is never recorded. As a result, the reason why young females declined PrEP could not be recorded in this paper.

### **Conclusion**

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The authors presented the assessment of PrEP uptake and retention amongst young females. Uptake and retention of PrEP was low in this population as measured against the total tested HIV negative. Hence this study results highlight the urgency for interventions to enhance uptake and retention in PrEP, systems tracking mechanisms to track those accounting for a



high percentage of not presenting themselves at the clinic to at least state the reasons of discontinuing PrEP to optimize PrEP retention.

The gap identified is a strong motivation to explore the factors associated with poor retention to develop strategies aiming to improve PrEP uptake and retention among young females. Taking into consideration that the voice of young females is the golden rule to address all the challenges they might be facing, which influences their poor uptake and retention. The study was conducted among selected clinics in Gauteng province of South Africa. Further studies should be conducted to explore perceptions of young females on PrEP uptake and retention, to provide in-depth information on the statistical data provided in this paper. The two will set the base for studies to develop strategies to enhance PrEP uptake and retention.

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## **Ethics declarations**

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## **Competing interests**

The authors declare that they have no competing interests.

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