Original Research Article

Daily oral Pre-Exposure Prophylaxis uptake, adherence and retention among Female Sex Workers in the Greater Gaborone City, Botswana

Abstract

Introduction: Efforts to expand optimal access to HIV prevention have included integrating pre-PrEP treatment and care of high-risk populations.We assessed the uptake, adherence and retention of daily oral pre-PrEP among FSWs in the Greater Gaborone City, Botswana.

Methods: Retrospective, quantitative cross-sectional study was carried out Between August 2018 and May 2020. Purposive sampling was used to select the study site and exhaustive sampling was used to select recorded participant's data. Descriptive statistics using SPSS (version 26), frequency and proportions were used to organise and analyse the data. Multiple regression analyses were performed to assess association between variables and $p < 0.05$ was considered significant.

Results:207 FSWs participated in the study. Adherence to PrEP was high (72.9%) but retention was low (16.9%). Unemployed FSWs adhered more to PrEP and age group 18-29 was less likely to be retained in the programme. Perception of no longer at substantial risk to HIV infection, loss of interest to continue with PrEP, drug side effects and busy life schedules were major reasons for non-retention in PrEP.

Conclusions: Lack of motivation challenged effective PrEP retention. Widespread messaging to communities and PrEP scale-up are necessary to generate demand and support for PrEP uptake among FSWs.

Keywords: PrEP, uptake, adherence,retention, female sex workers, HIV

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Comment [U2]: The introduction should capture the subject matter, statement of the problem and the justification of the study in a snapshot

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1 INTRODUCTION

Female sex workers are estimated to be 30 times more likely to be living with HIV than other women of reproductive age and face an increased burden of sexually transmitted infections. In 2019, the Joint United Nations Programme on HIV/AIDS estimated a mean HIV prevalence of 36% among sex

workers. The World Health Organisation (WHO) estimated the risk of HIV infection among sex workers was 21 times higher than for adult women aged 15–49 years [1], and accounted for 6% of global HIV infections in 2018 [2]. Among females aged 15 years and above, FSWs contributed 18% of all HIV infections [3]. Many studies have reported that Oral pre-exposure prophylaxis (PrEP) with daily tenofovir disoproxil fumarate (TDF) and emtricitabine (FTC) is effective at reducing sexual HIV acquisition [4–6]. However, prevention effectiveness is reliant on daily adherence prior to and during periods of sexual activity [7,8]. Regardless of the global efforts to expand optimal access to HIV prevention, treatment and care, female sex workers (FSWs) continue to experience a significant HIV burden [9].

In sub-Saharan Africa, HIV prevalence is 3–10 times higher among FSWs compared to the general population [10]. In Botswana, the second Behavioural and Biological Surveillance Survey estimated the HIV prevalence of 51.3% and incidence of 2.9% amongst FSWs [11]. Hence, the need for efforts to expand optimal access to HIV prevention.

The iPrEx study was the first to offer oral pre-exposure prophylaxis (PrEP) to 2,500 men who have sex with men at 11 sites in six countries Brazil, Ecuador, Peru, South Africa, Thailand and USA. The study reported that among HIV-negative gay men who were given PrEP the HIV infection declined by 44% compared with men taking a placebo; and the risk of infection among participants who took PrEP as prescribed declined by 99% [12]. Studies offering oral PrEP at six hospitals in France and Canada reported 86% reduction in the HIV infection rate compared to those taking a placebo [13]. Similarly, the Partners PrEP Trial amongheterosexual couples in which one partner was living with HIV across Kenya and Uganda reported62% reduction of the risk of HIV infection among those who took oral tenofovir and 73% among those who received Truvada [14].

Studies have also examined whether people on PrEP are less likely to use a condom, which could lead to an increase in sexually transmitted infections (STIs) including HIV. The PROUD Study in the United Kingdom reported no difference in condom usage or levels of STIs between people receiving PrEP and those who did not [15]. On the contrary, the evidence reviews which analysed twenty PrEP studies and trials among gay men and men who have sexwith men reported high rates (33 – 100%) of STIs among people on PrEP. It was concluded that, if people are engaging in high-risk sex that

increases their likelihood of contracting an STI, they are also likely to be exposed to HIV and so would greatly benefit from PrEP, along with interventions designed to increase condom use [16,17

Studies have recommended PrEP for all people at high-risk of HIV infection where oral PrEP tablet is taken once daily for HIV-negative people to block the acquisition of HIV [18,19]. In a study among men who have sex with men and transgender women in Brazil, several strategies to increase PrEP adherence, including SMS reminders and engagement through social media were used [20]. The study showed the uptake of oral PrEP increased over 50%, and notable increases in awareness of the service and knowledge of high-risk sexual behaviour among participants [21]. The uptake of oral PrEP has been most successful among couples and female sex workers in Kenya and similar successes have been reported in Zimbabwe and South Africa [22,23].

Many people who could benefit from PrEP however, are still unaware of its existence. In a study of awareness and acceptability of PrEP among men who have sex with men in UK, only 34.5% were aware of PrEP; but men who tested for HIV every six months were more likely to be aware of PrEP [24,25] Understanding the rates of adherence to PrEP and addressing the barriers preventing adherence are necessary to the long-term success of PrEP [26].

PrEP was integrated in the Botswana HIV and TB Treatment Guideline in 2016 [27]. A technical working group (TWG) was established to conduct formative discussions with various high-risk populations in six selected districts including Gaborone, and other major towns in the country. The report of the TWG indicated over 80% of FSWs who believed they would adequately adhere to PrEP faced challenges including safety and efficacy of PrEP due to other on-going medical interventions and strict adherence. More than 50% anticipated challenges of uptake due to the need for quarterly HIV testing, and over 40% perceived challenges of uptake due to the need for monthly medication pick-ups and the possibility of developing sideeffects.Previous report in Botswana have indicated that 52% of FSWs perceived themselves to be at high risk of HIV infection; inconsistent use condoms (39.6%), having multiple partners (36.9%) and 6.6% had low knowledge of PrEP. After receiving more information about PrEP, 85% of FSW were willing to take PrEP [28]. PrEP was introduced in Botswana as an addition to combination-prevention strategies for FSWs. Since then, no study was carried out to assess the efficiency of PrEP as an intervention in these target groups. This study aimed

to assess the uptake, adherence and retention of daily oral PrEP rates and reasons for non-retention among FSWs in the Greater Gaborone in order to determine acceptability

of PrEP as preventive measure against HIV infection.

2 METHODS

2.1 Studysetting, design and population

Gaborone is the capital and largest city in Botswana. The population of Gaborone is approximately 232,000 with more than 10% of the population living in the capital. It is cosmopolitan with its habitants engaged in small- and large-scale businesses, tourism, entrepreneurship, entertainment and other livelihood activities. The site was chosen because it is centrally placed for socio-economic opportunities and its surrounding areas are convenient for purposes of FSWs.

We carried out a quantitative retrospective cross-sectional descriptive study to assess the uptake, adherence and retention of FSWs in the PrEP programme. The target population were all FSWs who were screened for eligibility and enrolled for daily oral PrEP between August 2018 and March 2020. Only data of adult FSWs in the Greater Gaborone district aged 18 years and above were analysed. In this study, FSWs were defined as workers who provide and/or engage in sexual activities or acts in exchange for monetary, materialistic, or any type of support, favours, or gain [29,30].

2.2 Ethical considerations

Ethical issues in this included access to client's sensitive information by the researcher. Therefore, confidentiality was assured by ensuring that client's information was anonymised by not including information that could be used to trace back to the client's identity; records were only available to the researcher and the name of the Service Provider where data was collected was kept confidential. Ethical clearance was granted by the Ministry of Health and Wellness Ethics Review Board and permission to conduct the study in the study sites was granted by the Ministry of Health and Wellness, District Health Management Team and site management.

2.3 Data source and collection tool/Instrument

Data were records of FSWs stored at the service provider. The data extraction tool collected demographic information, PrEP number or code, date when PrEP was started, date when PrEP was discontinued; nationality, relationship status, education background and records on screening for risk

for HIV infection. Data on screening for substantial risk for HIV infection (acute HIV status, creatinine clearance, Hepatitis B test, venereal disease research laboratory (VDRL) test results for Syphilis and presence of any STI type) were used to assess eligibility for PrEP. In determining adherence, data from the records were collected on the number of visits and the duration a client received medication. Adherencewas measured by client's ability to take a daily oral tablet of PrEP for a period of HIV exposure without defaulting. Retention to PrEP was measured by client's ability to stay on PrEP for at-least 6 months without defaulting, as long as one was still at risk of contracting HIV. The records have in addition a section which collected client's information on the reasons for stopping PrEP and the client's HIV status at the time of discontinuation of PrEP.

2.4 Data Analysis

The independent variables included age, nationality, relationship status educational background, and employment status while the dependent variables/outcomes were uptake, adherence and retention to PrEP. Descriptive statistics (frequency and proportions) were used to present the results and logistic regression analyses were used to determine the association between variables. $p < 0.05$ was considered statistically significant.

3 RESULTS

3.1 Demographic characteristics

A total of 1,254 FSWs tested by the Service Provider were eligible for PrEP. However, only 207 (16.5%) were enrolled in PrEP. Majority (61.4%) were aged between 18 and 29 years, 79.2% had secondary school education, majority (92.3% and 66.7%) were unmarried and unemployed respectively. Divorcees accounted for 0.5% (Table 1).

Table 1: Demographic characteristics FSWs on PrEP in Greater Gaborone, Botswana

Demographic characteristics	Number of respondents (n 207)	Proportion (%)
Educational Background		
None	**2**	1
Primary School	3	1.4
Secondary School	164	79.2
Tertiary School	38	18.4
Age		
18-29	127	61.4
30-41	64	30.9

42-53	16	7.7
Relationship Status		
Divorced	1	0.5
Married	15	7.2
Single	191	92.3
Employment Status		
Employed	69	33.3
Unemployed	138	66.7
Nationality		
Citizens	183	88.4
Foreigners	24	11.6

3.2 Adherence, retention and sero-conversion status

The results of the status of adherence and retention to PrEP programme are shown in Table 2.Majority (93.7%) were young adults; 92.2% were single; 79.5% had secondary education and 66.7% were unemployed. Adherence to the prophylaxis was high (72.9%) among secondary school leavers. Similarly, single FSWs, unemployed and citizens adhered more to the programme. On the average, retention into the programme was low (16.9%) and high non-retention rates of 89.6%, 83.8%, 83.5% and 84.1% were seen among 13 – 30-year age group, single, secondary school leavers and the unemployed respectively. Information on seco-status was missing for all categories.

Table 2: The pattern of adherence and retention in the PrEP programme among FSWs in Gaborone, Botswana

Citizens	Adherence			Retention						Sero-status
	n	Yes	%	No	%	Yes	%	No	%	
Age										
18 - 30	135	85	63	50	37	14	10.4	121	89.6	None
31 - 42	59	54	91.5	5	8.5	15	25.4	44	74.6	None
43 - 53	13	12	92.3	1	7.7	6	46.2	7	53.8	None
Marital status										
Divorced	1	1	100	0	0	1	100	0	0	None
Married	15	13	86.7	2	13.3	3	20	12	80	None
Single	191	137	71.7	54	28.3	31	16.2	160	83.8	None
Education status										
None	2	2	100	0	0	1	50	1	50	None
Primary	3	3	100	0	0	2	66.7	1	33.3	None
Secondary	164	114	69.5	50	30.5	27	16.5	137	83.5	None
Tertiary	38	32	84.2	6	15.8	5	13.2	33	86.8	None
Employment status										
Employed	69	60	87	9	13	13	18.8	56	81.2	None
Unemployed	138	91	65.9	47	34.1	22	15.9	116	84.1	None

Nationality										
Citizens	183	129	70.5	54	29.5	32	17.5	151	82.5	None
Foreigners	24	22	91.7	2	8.3	3	12.5	21	87.5	None

3.3 Association of adherence and retention with demographic characteristics

The results of the association of the variables with adherence and retention are presented in Table 3. At 95% CI, employed FSWs were 2.4 likely to adhere to PrEP ($p < 0.049$) and the younger age group (18 - 30 years) significantly associated with retention ($p < 0.001$).

Table 3: The association of demographic variables with adherence and retention to PrEP programme among FSWs in Gaborone, Botswana.

Demographic factors		Adherence			Retention		
	n	AOR	95% CI	p-value	AOR	95% CI	p-value
Age group							
18-30 years	135	0.21	0.03 - 1.76	0.149	0.12	0.03-0.41	0.001**
31-42 years	59	0.95	0.09 - 9.37	0.962	0.4	0.11- 1.43	
43-53 years	13	1			1		
Educational background							
Secondary	169	0.44	0.16 – 1.19	0.104	1.47	0.50-4.32	0.48
Tertiary	38	1			1		
Marital status							
Single	192	2.14	0.36 – 12.7	0.401	1.19	0.27-5.28	0.823
Married	15	1			1		
Employment status							
Employed	69	2.36	1.04 – 5.57	0.049*	0.94	0.41- 2.19	0.89
Unemployed	138	1			1		
Nationality							
Citizens	183	0.49	0.10 – 2.40	0.486	2.57	0.66-10.08	0.176
Foreigners	24	1			1		

OR = Odd ratio, CI = confidence interval, *p < 0.05, **p < 0.001, 1 = reference group

3.4 Reasons for discontinuation from PrEP programme

The reasons for discontinuation from the programme were not indicated in 50(24.2%) of theclient's records. However, 18.4%, 14.0% and 12.6% had perceived that they were no longer at substantial risk to HIV infection, side effects and no longer interested in the programme respectively. Lack of knowledge of PrEP accounted for 8.2% of the reasons for discontinuation from the programme (Table 4).

Table 4: Reasons for discontinuation from PrEP programme as given by FSWs in Gaborone, Botswana

Reasons	Frequency	Percent
Busy lifestyle	24	11.6
Fell pregnant	1	0.5
Felt lazy for refill	1	0.5
Forgot to take medication	1	0.5
Lack of funds to travel for medical checks	3	1.4
Lack of knowledge about PrEP	17	8.2
No longer at substantial risk	38	18.4
No longer interested	26	12.6
Relocation	17	8.2
Side effects	29	14.0
No answer	50	24.2
Total	**207**	**100.0**

4. DISCUSSION

4.1 Uptake and adherence to PrEP

Global studies have indicated lack of education as a barrier to adherence to PrEP. Poor knowledge of PrEP, doubts about its effectiveness, fear of side effects, perception of low risk to HIV risk, and adherence to multiple medications were reported as major barriers to PrEP uptake and adherence [31,32]. In this study, uptake of PrEP was low with only 16.5% among the eligible FSWs enrolled to PrEP. This is a very insignificant proportion and is a major concern because the reasons for such low uptake are not very clear. It can however, be argued that the low uptake of PrEP could be a result of the perceptions of being not at risk and low knowledge about the benefits of PrEP in this high risk to HIV infection population. The Treatment and Prevention for FSWs Demonstration Project (TAPS) has reported that PrEP uptake was more among younger FSWs [33]. In this study, the age group 18 – 29 enrolled (up took) more into PrEP compared to other categories. We attributed the relatively high PrEP uptake in this age category to the efforts the Government and other key stakeholders in the strategic campaigns on HIV infection prevention which have motivated the young age population to enrol into the programme. The older clients were less likely to enrol could partly be explained by perceptions and attitudes on the new medication, past experiences including stigma and false confidence on the knowledge of HIV infection would partly explain the less likelihood of older clients to enroll into the PrEP programmes.

We found high adherence to PrEP among participants with secondary education. This finding is encouraging and would partly be explained by that moderate education from schools empower these FSWs to access information on PrEP than those with primary education only and those who never went to school. These groupswere also more likely to be unemployed compared to tertiary education leavers, therefore, have less busy schedules hence high adherence to PrEP.

4.2 Knowledge of PrEP on adherence

In a study on FSWs in Baltimore, South Africa, PrEP education was indicated as a potential strategy to increase adherence to PrEP. That study reported that some sex workers were willing to use PrEP if it had limited side effects and could be used intermittently. It was concluded that there is need for transparency to provide information on known and unknown PrEP side effects, guidance on intermittent use, and proper counselling on medication adherence and management for those initiating PrEP [34].Previous studies have also shown that innovative educational training strategies resulted in better HIV risk assessment and can overcome many barriers to PrEP prescription [35,36]. Only a small proportion (14%) of the FSWs in this study have indicated lack of knowledge about PrEP as a reason for non-adherence and non-retention. The finding suggests that FSWs are aware of PrEP as a potential preventive measure for HIV infection and the low adherence is likely to be due to other reasons not elicited in this study. Further studies are needed to explore other reasons for low retention among FSWs in the Greater Gaborone, Botswana.

4.3 Employment status and adherence to PrEP

Studies in the sub-Saharan Africa have shown that unemployment, extreme poverty and material insecurity are strong drivers of sex work and render HIV prevention and PrEP adherence a lower priority when compared with the demand for meeting basic needs for many women [37].In this study adherence to PrEP was 87% and 66% among employed and unemployed FSWs respectively. The high adherence rate among employed FSWs could be explained by level of education and socio-economic status which enables them to plan, afford transport fare and allocate some time to attend

to their health. The low adherence among unemployed FSWs might be related to heavy domestic chores and the demand for daily basic needs to sustain livelihoods.

4.4 **Retention in PrEP programme**

Successful PrEP intervention is dependent on adherence and remaining in PrEP care. Studies have reported successes of uptake and low retention rates among FSWs [38,39]. We recorded an overall 16.9% PrEP retention compared to 72.9% overall adherence.Our finding is similar to a study in Kenya which reported only14.0% retention among FSWs. Although secondary school leavers and employed FSWs have high adherence rates [40], both have very low retention to the PrEP programme. These findings suggest thateducation and employment status do not successfully influence adherence and retention in PrEP programme.

4.5 Lost to follow-up

Studies have given reasons for lost to follow-up include mobility (moved out of the area and traveling) and pregnancy [41,42].We found the reasons for not wanting to continue included pregnancy (0.5%) and relocation to other locations were stated by 8.2% of clients. Perception of no longer at risk of HIV infection and loss of interest were common however common reasons for loss to follow-up. Our findings support previous reports [33,43]. Since HIV is still present as indicated by high incidences especially among young people, the perception of no longer at risk to HIV infection suggests a breakdown in dissemination of correct information about HIV and its preventive measures. Loss of interest on the other hand suggest a decline in the motivation to continue in the programme which could also explain the low enrolment rate of 16.5% of the eligible FSWs we found in this study.

5. CONCLUSION

Daily oral PrEP has proved to be an effective addition to the combined HIV prevention strategies to significantly reduce HIV risk. Lack of motivation, and benefits could explain low PrEP uptake and

retention. Accurate, relevant information dissemination about PeRP to communities to generate demand and support for PrEP use, especially for groups of people at high risk is recommended.

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