



The Determinants of Discontinuity and Sero-Conversion by Men Who Have Sex with Men and Female Sex Workers, Receiving Pre-Exposure Prophylaxis against HIV/AIDS in the North West Region

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Abstract

Pre-exposure prophylaxis (PrEP) for HIV prevention has evolved significantly over the years and now demonstrated the efficacy of oral PrEP. PrEP presents the opportunity to change the face of HIV prevention by offering a new option for protection against HIV and disrupting current HIV prevention systems. PrEP is an HIV prevention method that uses antiretroviral (ARVs, anti-HIV) drugs to help prevent HIV. It is primarily taken by HIV negative patients, and reduces the chances of getting HIV. A positivity rate of 3% in the North West region, with Men who have Sex with Men (MSM) tested of 1676 and positive of 78 which gives a positivity rate of 4% and Female Sex Workers (FSW) tested of 4203 and positive identification of 189 and positivity rate of 4%. Addressing PrEP is fundamental to delivering quality healthcare and achieving optimal health, hence the research titled "the determinants of discontinuity and sero-conversion by men who have sex with men and female sex workers, receiving pre-exposure prophylaxis against HIV/AIDS in the North West Region. Questionnaires were administered to 150 members of key population in the North West (MSM and FSW). A cross-sectional study with a purposive sampling method was used in data collection from consented study respondents. Selected participants of each group for the interview, questionnaire administration, was based on their availability and convenience. Data obtained was analysed using the SPSS version 23, and statistical significance was considered if p value was ≤ 0.05 . Out of 150 study participants in this study, majority were males, accounting for a percentage score of 64.7% (n=97). Females followed with 35.3% (n=53). With just 27% (n=41) reported to had used post exposure prophylaxis. 3% (n=4) reported to have used PEP more than 6 months before the use PrEP the start of the study. MSM were significantly 1.4 time more likely to take PrEP compared to FSW (p=0.011). Also, respondents within the age range of 21 to 26 years (p=0.002) and 27-32 years (p=0.007) old had 1.03 and 0.05 significantly increased chances of taking PrEP compared to older ages respectively in this study. A majority of 75 (50%) reported that it is 95% effective in the prevention of HIV transmission. 58 respondents (38.7%)

reported that PrEP is 100% safe in preventing HIV transmission. This study therefore concludes that the use of Oral PrEP as an HIV/AIDS prevention method has a significant effect on the rate of new HIV/AIDS; it is therefore recommended that More research should be done with respect to the use of the different PrEP method in the prevention of HIV.

Keywords: Pre exposure prophylaxis; Discontinuity; Seroconversion; Men Who Have Sex with Men; Female Sex Workers

Abbreviations

PrEP: Pre-Exposure Prophylaxis; ARV: Antiretroviral; MSM: Men who have Sex with Men; FSWs: Female Sex Workers; ART: Antiretroviral Therapy; DU: Drug Users; WHO: World Health Organization; PEP: Post-Exposure Prophylaxis; CHP: Care and Health Program; CHILL: Community HIV/AIDS Investment for Longer and healthier Lives; USAID: United States Agency for International Development.

Background

HIV incidence remains high globally, with up to 1.7 million people newly infected annually despite outstanding progress in reducing new HIV infections and related deaths [1]. Female sex workers (FSWs) and men who have sex with men (MSM) are disproportionately more vulnerable in acquiring and transmitting HIV as compared with the broader adult population [2]. In 2016, the United Nations General Assembly agreed that a fast-track response was required to end AIDS by 2030 and reduce new HIV infections to fewer than 500,000 annually by 2020 worldwide. The response is primarily through continued progress towards the 95-95-95 target (by 2030, 95% of all people living with HIV will know their HIV status, 95% of those diagnosed will receive antiretroviral therapy (ART) and 95% will have viral suppression) and through an intensive focus on people-centred implementation of the five prevention pillars.

The five prevention pillars are a combination prevention approach involving sexual education and economic empowerment to women, human rights programmes for key populations, condom programmes, voluntary medical male circumcision, and the use of pre-exposure prophylaxis (PrEP). Key populations (Combination, prevention and harm re-education packages for and with – Sex workers, Gay men and other men who have sex with men, People who inject drugs, transgender people and prisoners), adolescent girls and young women (Combination prevention packages in settings with high HIV incidence (based on differentiated layered packages), adolescent boys and men (Including voluntary medical male circumcision and promoting access to testing and treatment), condom programming (Promotion and distribution of male and female condoms as well as lubricants), ARV-based prevention (Pre-exposure prophylaxis, post exposure prophylaxis, treatment as

prevention including for elimination of vertical transmission) [3].

In West and Central Africa, which accounts for one-fifth of new HIV infections globally, 40% of new infections are among key population groups [4]. Specifically, in Cameroon, HIV prevalence among FSW and MSM was 24.3% and 20.6%, respectively, in 2019 compared with 3.1% in the general population, they often have legal and social issues related to their sexual behaviours that increase their vulnerability to HIV [5]. Increasing coverage of evidence-based interventions among key populations is integral to achieving HIV epidemic control in Cameroon and the broader region [6]. In Cameroon, female sex workers (FSWs), men who have sex with men (MSM) and drug users (DU) carry disproportionately high burdens of HIV. Despite specific vulnerabilities and health needs, young key populations remain understudied and underserved in Cameroon owing to legal, ethical, and social challenges [7].

HIV antivirals for pre-exposure prophylaxis (PrEP) are known to affect detection of early HIV infection through suppression of viral load and delayed seroconversion. Published cases of incident HIV infection when PrEP use was objectively demonstrable were identified, consisting principally of seroconverts from the Partners PrEP study (a clinical trial of PrEP efficacy). Data were reviewed to determine the impact of PrEP on the detection of HIV RNA, p24 Ag and seroconversion delay [8]. A growing body of evidence has demonstrated that HIV pre-exposure prophylaxis (PrEP) can be a highly effective biomedical HIV prevention method [9]. Furthermore, emerging studies have shown that the widespread offer of PrEP through affordable and flexible service delivery can meaningfully reduce population-level HIV incidence [10]. The World Health Organization (WHO) has recommended PrEP for persons at high risk of HIV as part of a combination HIV prevention strategy [11].

Pre-exposure prophylaxis (PrEP) for HIV prevention has evolved significantly over the years where clinical trials have now demonstrated the efficacy of oral PrEP, and the field is scaling-up implementation. The WHO and UNAIDS have made PrEP implementation a priority for populations at highest risk, and several countries have developed guidelines and national plans accordingly, largely based on evidence

generated by demonstration projects. PrEP presents the opportunity to change the face of HIV prevention by offering a new option for protection against HIV and disrupting current HIV prevention systems [12]. Critical questions remain regarding local relevance for health problem priority, optimal demand generation strategies, how to address supply and supply chain issues, and how to best provide adequate support to PrEP clients for effective and consistent use, especially in countries across sub-Saharan Africa [13].

PrEP is an HIV prevention method that uses antiretroviral (ARVs, anti-HIV) drugs to help prevent HIV, is primarily taken by HIV negative patients, and reduces the chances of getting HIV from sex or injection drug use, before exposure to HIV, to PREVENT HIV infection. PrEP is an additional tool for HIV prevention and PrEP is different from post-exposure prophylaxis (PEP) and antiretroviral therapy (ART). When taken as prescribed, PrEP is highly effective for preventing HIV. PrEP reduces the risk of getting HIV from sex by about $\geq 95\%$ [14]. PrEP interferes with the pathways that HIV uses to cause a permanent infection. For HIV to cause infection the virus must enter the body, infect certain immune cells, make copies of itself (replicate) within these immune cells, then spread throughout the body. When PrEP is taken consistently and correctly, antiretroviral drugs get into the bloodstream and genital and rectal tissues. The drugs work to help prevent HIV from replicating within the body's immune cells, which helps to prevent a permanent infection. PrEP is recommended for MSM who are HIV-negative, have had condomless anal sex in the last three months and believe that it is likely that they will have condomless sex again in the next three months [15]. However, not all individuals, including gay men, who could benefit from PrEP because they do not consistently use other risk reduction strategies (e.g., condoms), endorse PrEP for their own use. This can be attributed to decreased access, cost, and fear of side effects, perceived drug inefficacy, and discrimination [16].

For PrEP to help stop HIV replication from happening, drug levels in the body must remain high. If pills are not taken consistently as prescribed there may not be enough medication in the body to reduce the risk of HIV infection. PrEP is effective at decreasing HIV incidence. Decrease in HIV incidence has been reported in places with oral PrEP scale up. Greater impact by combining approaches to HIV prevention PrEP provides an additional prevention intervention to be used together with existing interventions. PrEP is not meant to replace or be a substitute for existing prevention interventions, such as condoms. Present antiretroviral-based HIV prevention strategies focus on treating people with HIV infection with antiretrovirals as soon as feasible to reduce their risk of transmitting to others, and providing two-drug pre-exposure prophylaxis (PrEP) and three-drug post-exposure prophylaxis (PEP) to those HIV-uninfected individuals who are at risk for HIV infection. PrEP is highly

effective when used correctly. PrEP with daily oral tenofovir disoproxil fumarate-emtricitabine has been shown to help prevent new HIV infection among Men who have sex with men (MSM) and Female sex workers (FSW) at substantial risk. Evidence suggests a protective benefit of PrEP for Men who have sex with men (MSM) and Female sex workers (FSW) at risk for HIV, although low adherence is emerging as a barrier to effective use [17].

In Cameroon, just the first 2 options which are Oral Daily PrEP and Oral ED-PrEP are available. Taking PrEP can have long-term side effects for a small number of people, but these are usually extremely rare and reversible when you stop taking the medication. Nausea, vomiting and other gastrointestinal problems are potential side effects of PrEP, but have been reported by only a small percentage of people taking these medications [18]. Despite established HIV prevention strategies and broadly available diagnostic strategies in developed western countries, rates of HIV new infections remain high. Alternative strategies for HIV prevention, particularly among men who have sex with men (MSM), are crucial. This study is therefore aimed at establishing the effect on the use of PrEP as HIV/AIDS prevention among MSM and FSW, thereby reducing the number of new infections, thereby encouraging the effective use of PrEP by the general populations for HIV/AIDS prevention.

Methodology

A cross-sectional survey was carried out among clients (ages 21-50 and providers in 2 community-based organisations, implementing oral PrEP in the North West, followed by in-depth interviews. The study was carried out for a period of 6 months from February to July 2024. The population of the study was made up of 150 consented MSM and FSWs in the city of Bamenda who are currently on PrEP and those who have stopped PrEP. Excluded from the study were those who were on PrEP, but not adherent to the pill intake be it event driven or daily intake. This information was gotten through the study of clients files gotten from NGOs in the North West Region who work with members of this key population which are Affirmative Action and Cameroon Medical Women Association who, are currently implementing the Community HIV/AIDS Investment for Longer and healthier Lives (CHILL) project, funded through the Care and Health Program (CHP) as the led by United States Agency for International Development (USAID). In the above NGOs that work with MSM and FSW, the target population was easily identified and worked with. Primary data was collected through the use of well-structured questionnaires. Authorisation was gotten from the Regional Delegation of Public Health for the North West Region. Data gotten was analysed with SPSS version 23 and presented on charts and tables. A multiple linear Regression was considered for the study as each outcome

variable was to be predicted from two or more explanatory variables. The explanatory variables were continuous or categorical (PrEP enrolment, Retention, Discontinuation, Sero-positivity). A p value of less than or equal to 0.05 was considered statistically significant.

Results

Socio Demographic Data of Study Participants

Table 1 below presents the socio medical data of the study participants. Out of 150 study participants in this study, majority were males, accounting for a percentage score of 64.7% (n=97). Females followed with 35.3% (n=53). Most of them were within the ages of 21-26years old, accounting for more than half of the percentage (52%, n=78). These were closely followed by those between the age group of 27-32years old with a percentage score of 28% (n=42). Majority of the respondents in this study reported to have had advanced level (32%, n=48) followed by those who reported to have had a BSc, accounting for a percentage score of 31.3% (n=47). Between MSM and FSW who took part in this study, majority were MSM, accounting for 64.7% (n=97). FSW accounted for 35.3% (n=53) (Table 1).

Variable	Categories	Frequencies	Percentages (%)
Sex	Male	97	64.7
	Female	53	35.3
Age Range	21-26 years	78	52
	27-32 years	42	28
	33-37 years	23	15.3
	< 38 years	7	4.7
Level of Education	FSLC	21	14
	O level	26	17.3
	A level	48	32
	BSc	47	31.3
	Masters	8	5.3
Participant Type	MSM	97	64.7
	FSW	53	35.3

Table 1: Socio demographic characteristics of study participants.

Factors that Influence Uptake of Pre-Exposure Prophylaxis as HIV/AIDS Prevention by Men Who have Sex with Men (MSM) and Female Sex Worker (FSW) In the North West Region
Out of a total sample size of 150 respondents, only 27% (n=41) reported to had used post exposure prophylaxis. 3% (n=4) reported to have used PEP more than 6 months before the use of PrEP and the start of the study. It is interesting to

notice that a whole 68% (n=102) reported not to have used PEP before as shown in Figure 1 below.

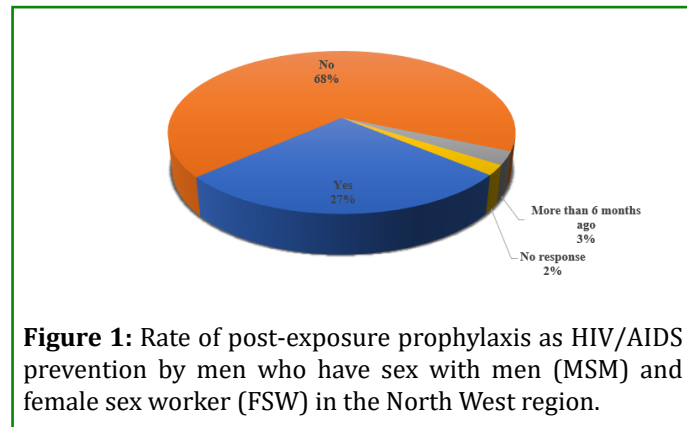


Figure 1: Rate of post-exposure prophylaxis as HIV/AIDS prevention by men who have sex with men (MSM) and female sex worker (FSW) in the North West region.

Distribution of PrEP use between MSM and FSW

There was a statistically significant association between PrEP use between MSM and FSW in this study ($p=0.011$). Compared to FSW, MSM used more of PrEP as shown in Table 2 below.

		Participant type		Total	X ² (p value)
		MSM	FSW	n(%)	
		n(%)	n (%)		
Have you ever used of PrEP	Yes	33 (22.0)	08 (5.30)	41 (27.3)	21.225 (0.011)*
	No	61 (40.7)	41 (27.3)	102 (68.)	
	More than 6 months ago	03 (2.00)	01 (0.70)	04 (2.70)	
	No response	00 (0.00)	03 (2.00)	03 (2.00)	
Total		97 (64.7)	53 (35.3)	150 (100)	

Source: *-Statistically significant at 0.05 significance level.

Table 2: Difference of PrEP use between MSM and FSW.

At the time of data collection, 98% (n=147) reported to had been highly sexually active in the last 6 months before enrolment on to the PrEP. 78.7% (n=118) reported to had had vaginal or anal intercourse without condoms with more than 1 partner. 44.7% (n=67) reported to have had a sex partner with 1 or more HIV risk factors. A whole 82.7% (n=124) reported to have had sex with more than 1 partner in the last 6 months before enrolling into the PrEP. Interestingly, 90.7% (n=136) agreed that they had sex without condom in the last 6 months before PrEP enrolment. In fact, 55.3% (n=83) reported that in the past 6 months before enrolling for PrEP, they had sex with people whose HIV status was not known.

Association between Pre-Exposure Prophylaxis as HIV/AIDS prevention

There was a statistically significant association only with use of PrEP and if the respondents have a sex partner with 1 or more HIV risk factors ($p=0.014$). The data showed that

majority of respondents that had a sex partner with of more HIV risk factors reported to have actually used PrEP before (14%). All other variables in this study per this section did not have any statistically significant association with use of PrEP ($p>0.05$).

		Uptake Rate of PrEP (Pre-Exposure Prophylaxis)				X ²
		Yes	No	>6months	No resp	(p value)
		n(%)	n(%)	n(%)	n(%)	
Highly Sexually activity in the last 6 before enrolment on PrEP	Yes	41 (27.3)	99 (66.0)	04 (2.7)	03 (2.00)	1.44
	No	00 (0.00)	03 (2.00)	00 (0.00)	00 (0.00)	-0.7
Vaginal or anal intercourse without condoms with more than one	Yes	31 (20.7)	80 (53.3)	04 (2.70)	03 (2.00)	
	No	10 (6.70)	21 (14.0)	00 (0.00)	00 (0.00)	2.65
	No response	00 (0.00)	01 (0.70)	00 (0.00)	00 (0.00)	-0.85
Sex partner with one or more HIV risk factor	Yes	21 (14.0)	40 (26.7)	03 (2.0)	03 (2.00)	
	No	03 (2.00)	38 (25.3)	00 (0.00)	00 (0.00)	20.7
	I don't know	17 (11.3)	23 (15.3)	01 (0.70)	00 (0.00)	(0.014)*
	No response	00 (0.00)	01 (0.70)	00 (0.00)	00 (0.00)	
Did you have sex with more than one partner? In the last 6 months before enrolment on PrEP	Yes	38 (25.3)	79 (52.7)	04 (2.70)	03 (2.00)	6.42
	No	03 (2.00)	21 (14.0)	00 (0.00)	00 (0.00)	-0.376
	No response	00 (0.00)	02 (1.30)	00 (0.00)	00 (0.00)	
Did you have sex without a condom, In the last 6 months before PrEP enrolment?	Yes	40 (26.7)	89 (59.3)	04 (2.70)	03 (2.00)	4.46
	No	01 (0.70)	12 (8.00)	00 (0.00)	00 (0.00)	-0.615
	No response	00 (0.00)	01 (0.70)	00 (0.00)	00 (0.00)	
In the last 6 months before PrEP enrolment, did you have sex with people whose HIV status you do not know?	Yes	25 (16.7)	51 (34.0)	04 (2.70)	03 (2.00)	
	No	09 (6.00)	32 (21.3)	00 (0.00)	00 (0.00)	9.31
	Maybe	07 (4.70)	15 (10.0)	00 (0.00)	00 (0.00)	-0.409
	I don't know	00 (0.00)	04 (2.70)	00 (0.00)	00 (0.00)	

Source: *-statistically significant at 0.05 significance level.

Table 3: Pre-exposure prophylaxis as HIV/AIDS prevention.

There was also an observed statistically significant association between use of PrEP and if any of the respondents' partners were at risk of HIV infection ($p=0.0001$). majority

of those that suspected that their partners were at risk of HIV infection used PrEP (14%) followed by those that knew that their partners were at risk of HIV infection with 8.7% as shown in Figure 2 below.

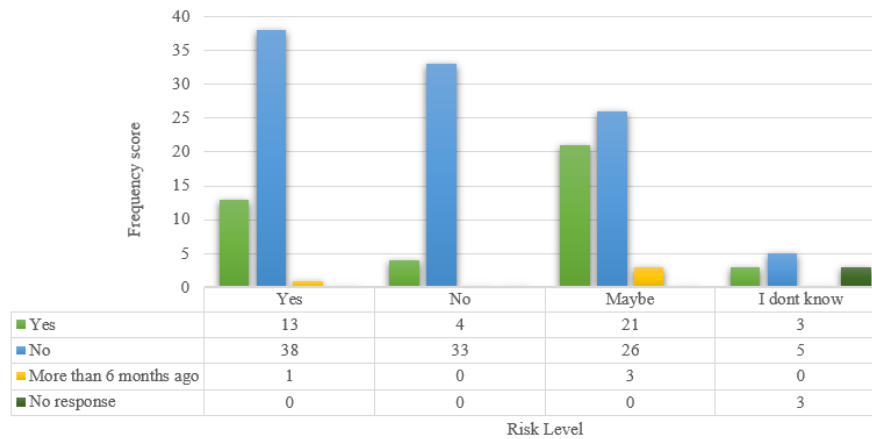


Figure 2: Association between use of PrEP and if any of the respondents' partners were at risk of HIV infection.

Multivariate Analysis between Uptake of PrEP and Socio Demographics

MSM were significantly 1.4 time more likely to take PrEP compared to FSW ($p=0.011$). Also, respondents within

the age range of 21 to 26years ($p=0.002$) and 27-32years ($p=0.007$) old had 1.03 and 0.05 significantly increased chances of taking PrEP compared to older ages respectively in this study.

PrEP ^{2a}	B	Sig.	aOR	95% Confidence Interval for Exp(B)		
				Lower Bound	Upper Bound	
Intercept	0.772	.021*				
Gender	Male	0.327	.011*	1.39	0.685	2.81
	Female	0 ^b	.	.	.	.
Age range	21-26years	0.834	.002*	1.03	0.14	1.343
	27-32years	0.619	.007*	0.54	0.175	1.66
	33-37years	0.251	0.672	0.28	0.402	4.111
	38years plus	0 ^b	.	.	.	.
Educational level	FSLC	0.239	0.151	0.29	0.053	1.573
	O level	0.039	0.934	0.96	0.384	2.412
	A level	0.741	0.201	0.48	0.153	1.483
	BSc	8.862	.	1.55	1.55	1.558
	Masters	0 ^b	.	.	.	.

Source: The reference category is: No. *-statistically significant at 0.05 statistical level.

This parameter is set to zero because it is redundant.

Table 4: Multivariate analysis between uptake of PrEP and socio demographics.

Effect of PrEP as HIV/AIDS prevention by Men Who Have Sex with Men and Female Sex Workers

Figure 3 below presents the respondent's responses on how safe PrEP is in the prevention of HIV infections. A majority

of 75 (50%) reported that it is 95% effective in the prevention of HIV transmission. 58 respondents (38.7%) reported that PrEP is 100% safe in preventing HIV transmission, even though only 8% ($n=12$) reported that they don't know.

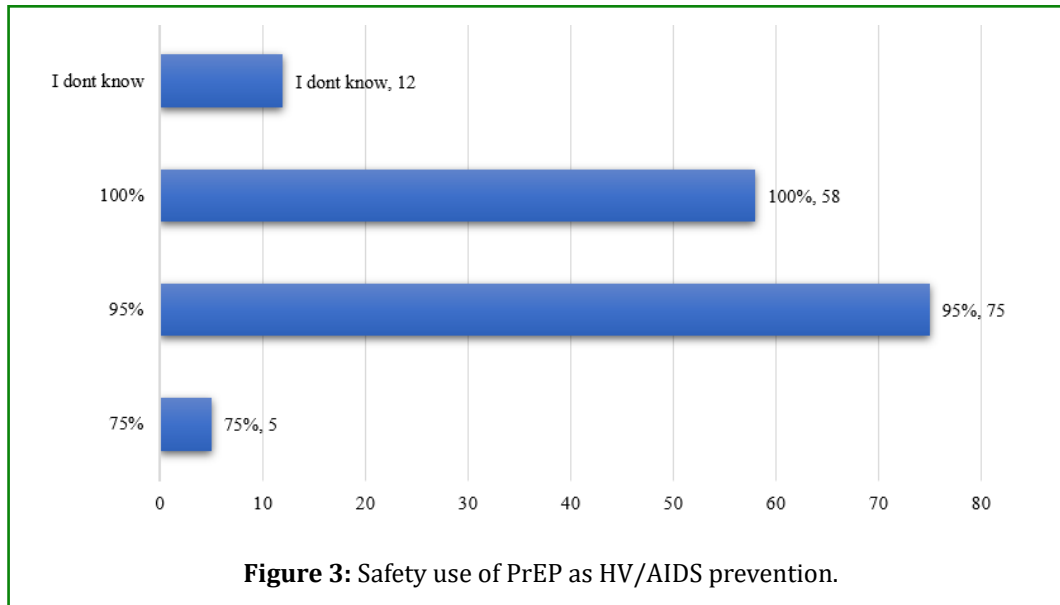


Figure 3: Safety use of PrEP as HIV/AIDS prevention.

Association between safety PrEP in the prevention of HIV, and socio demographics

There was a statistically significant association between how safe PrEP use is in the prevention of HIV and socio

demographic variables such as age range ($p=0.040$), educational level ($p=0.0001$) and gender (0.0001). Participant type also has a statistically significant association with how safe PrEP is in the prevention of HIV transmission ($p=0.0001$) (Table 5).

		How safe is PrEP use in the Prevention of HIV?				X ² (p value)
		75%	95%	100%	I don't know	
		n(%)	n(%)	n(%)	n(%)	
Age range	21-26years	04 (2.70)	33 (22.0)	32 (21.3)	09 (6.00)	17.64 (0.040)*
	27-32years	01 (0.70)	18 (12.0)	20 (13.3)	03 (2.00)	
	33-37years	00 (0.00)	17 (11.3)	06 (4.00)	00 (0.00)	
	38years plus	00 (0.00)	07 (4.70)	00 (0.00)	00 (0.00)	
Educational level	FSLC	00 (0.00)	18 (12.0)	03 (2.00)	00 (0.00)	42.22 (0.0001)*
	O level	00 (0.00)	20 (13.3)	03 (2.00)	03 (2.00)	
	A level	05 (3.30)	19 (12.7)	21 (14.0)	03 (2.00)	
	BSc	00 (0.00)	16 (10.7)	25 (16.7)	06 (4.00)	
	Masters	00 (0.00)	02 (1.30)	06 (4.00)	00 (0.00)	
Gender	Male	02 (1.30)	32 (21.3)	51 (34.0)	12 (8.00)	37.51 (0.0001)*
	Female	03 (2.00)	43 (28.7)	07 (4.70)	00 (0.00)	

Source: *-statistically significant at 0.05 significance level.

Table 5: Relationship between PrEP as prevention against HIV/AIDS and socio demographics.

From the 150 respondents in this study, 96% ($n=144$) reported that they can easily have access to PrEP drugs while only 4% ($n=6$) reported that they cannot easily have access to PrEP meds. Even though a majority of 52% ($n=78$) reported that they have not been exposed and aware since they started PrEP, 36.7% ($n=55$) confirmed that they have been exposed while being aware. 11.3% ($n=17$) reported

that they may have been exposed and were aware.

To those that reported to have been exposed since they started PrEP, a majority of 79.2% reported that their exposure was sexual, 14.6% reported that the exposure was routine while 6.3% reported that they were exposed PrEP was on demand as shown in Figure 4 below.

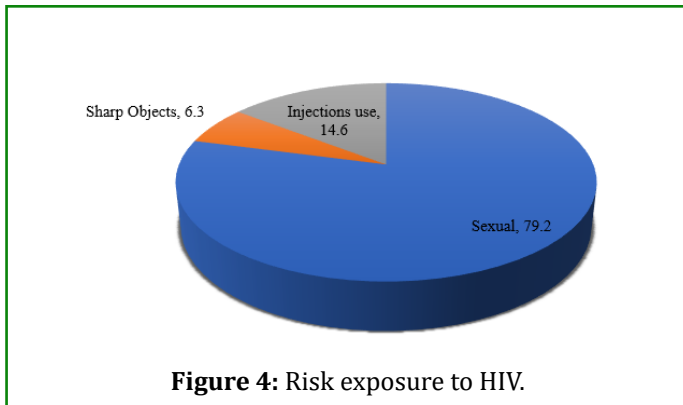


Figure 4: Risk exposure to HIV.

A majority of 34.7% (n=52) reported to have been on PrEP

for 2 years. These were followed by 22.7% (n=34) that had been on it for 1 yr. 20.7% (n=31) had been on it for less than 6 months and 20% (n=30) had been on it for more than 6 months.

Association between how long respondents' partners have been on PrEP and if their sexual partners are positive to HIV.

There was a statistically significant association between the 2 variables above ($p=0.0001$). As shown in Table 6 below, majority of those whose sexual partners were HIV positive had been on PrEP for 1 yr and above. Also, those that was not so sure if their sexual partners were HIV positive or not were on PrEP for 2 years.

		Is your sexual partner positive to HIV?				X ² (p value)
		Yes	No	Maybe	No response	
How long have you been on or were on PrEP	Less than 6 months	00 (0.00)	13 (8.70)	01 (0.70)	17 (11.3)	59.85 (0.0001)*
	More than 6 months	00 (0.00)	15 (10.0)	01 (0.70)	14 (9.30)	
	1 yr	05 (3.30)	21 (14.0)	00 (0.00)	08 (5.30)	
	2 years	03 (2.00)	34 (22.7)	04 (2.70)	11 (7.30)	
	About 3 years	03 (2.00)	00 (0.00)	00 (0.00)	00 (0.00)	

Source: *-statistically significant at 0.05 significance level

Table 6: Association between how long respondents' partners have been on PrEP and if their sexual partners are positive to HIV.

Major Reason for the enrolment of PrEP

A majority of 53.3% (n=80) reported that they enrolled for PrEP because it is a prevention method against HIV. These were followed by 22.7% (n=34) who reported that they enrolled for safety. Interestingly, 7.3% (n=11) enrolled because they were advised to as shown in Figure 5 below.

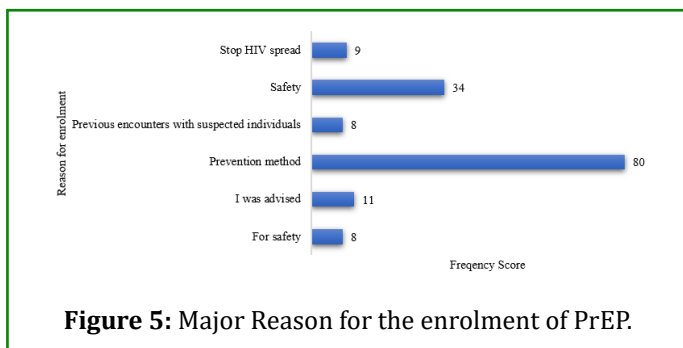


Figure 5: Major Reason for the enrolment of PrEP.

Determinants of Discontinuity by MSM and FSW in the North West Region

The highest determinant of discontinuity observed in this study was pill burden which accounted for a percentage score of 24.7% (n=37). This was followed by the complaint that respondents reported to had been taking drugs when

they are not sick which accounted for 22% (n=33). Even though 22% also reported not to have issues that may lead to discontinuity, 12% (n=18) attributed their discontinuity to forgetfulness as shown in Figure 6 below.

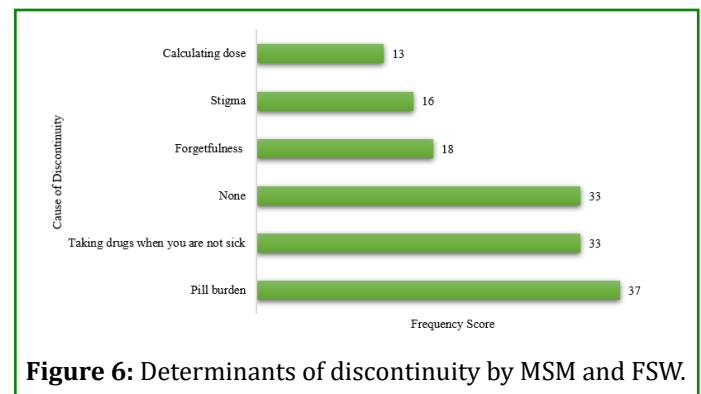


Figure 6: Determinants of discontinuity by MSM and FSW.

From the respondents that reported to experience side effects, 20% reported to have nausea, 5.6% reported to have body weaknesses and 4% reported to have dizziness. 70.4% reported not to have or not to have experienced any side effects. Even though majority reported not to have any side effects, up to 92.0% (n=138) reported that they can stop taking PrEP is they don't feel comfortable. Only 8% (n=12) reported that even if they don't feel comfortable, they will

not stop taking the PrEP. For those that's topped taking PrEP, they reported that they stopped because of the side effects

(11.3%) and the fact that they kept missing appointments (88.7%) (Table 7).

	Frequency	Percent	Valid Percent	Cumulative Percent
Side effects	17	11.3	11.3	11.3
Kept Missing Appointments	133	88.7	88.7	100
Total	150	100	100	

Table 7: What was your reason for stopping PrEP?

There was a statistically significant association between participant type and reason for stopping PrEP in this study ($p=0.004$). Majority of those that complained of side effects

were MSM. Majority of FSW complained rather of keep missing appointments (Table 8).

			What was your reason for stopping PrEP?		X ²
			Side effects	Kept missing appointments	(p value)
Participant type	MSM	Count	16	81	7.28
		% of Total	10.70%	54.00%	
	FSW	Count	1	52	(0.004)*
		% of Total	0.70%	34.70%	
Total % of Total		Count	17	133	
			11.30%	88.70%	

Source: *-statistically significant at 0,05 significance level

Table 8: Association between participant type and reason for stopping PrEP.

Determinants of Sero Conversion by men who have sex with men (MSM) And Female Sex Worker (FSW) Who Stopped PrEP or Still on PrEP in The North West Region

Rating Risk level at the period in which you stop PrEP: At the time of this study, 64.7% were still on PrEP. Up to 23.3% ratted themselves as very high risk at the period they stopped PrEP. 10% were ratted at high risk and only 2% were rated as low risk as indicated in Table 9 below.

	Frequency	Percent
On PrEP	97	64.7
Low Risk	3	2
High risk	15	10
Very high risk	35	23.3
Total	150	100

Table 9: Can you rate your Risk level at the period in which you stop PrEP?

Could you rate your risk level at the period of diagnosis? Based on sexual behaviours, number of sexual partners, use of preventions materials: Based on sexual behaviours,

number of sexual partners, use of preventions materials, 4% were rated as very high risk, 4,7% could rate themselves as medium risk and up to 30.7% could rate themselves as low risk. Comparison between MSM and FSW with respect to risk level at the period of the diagnosis based on sexual behaviours, number of sexual partners and use of prevention materials revealed that only MSM rated themselves at very high risk and medium risk. No FSW rated herself as very high risk or medium risk ($p=0.006$) as shown in Figure 7 below.

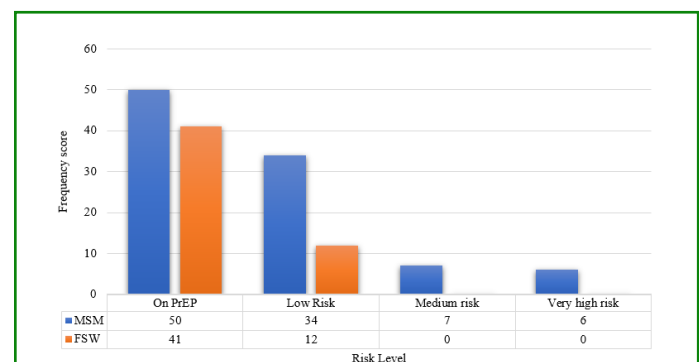


Figure 7: MSM and FSW risk level evaluation.

Discussion

Rate of Pre-Exposure Prophylaxis Uptake as HIV/AIDS Prevention by Men Who have Sex with Men (MSM) and Female Sex Worker (FSW)

This present study reveals that out of a total sample size of 150 respondents, only 27% (n=41) reported to have used post exposure prophylaxis. 3% (n=4) reported to have used PrEP more than 6 months before the start of the study. It is interesting to notice that a whole 68% (n=102) reported not to have used PrEP. These results were still not closer to that reported by Rugira [19] who had a PrEP of 45.5%. Even though the study of Rugira and colleagues [20] reported the prevalence only for the FSW. The rate of PrEP within FSW in this study was 5.3% which was still significantly lower than the 45.5% reported by [19]. These results were still lower than for those reported by Rao et al [21] and Irungu et al [22]. These differences could be attributed to changes in sample size between the present study and the compared studies. However, these results also align with earlier research, demonstrating varied PrEP uptake levels among FSWs, ranging from 2% to 49% [22].

The PrEP uptake by MSM in this study was 22%. The PrEP uptake among MSMs in this study was relatively lower compared to studies conducted in Atlanta, USA, which reported 34% among young black MSM [23]. Similarly, a study in the Netherlands found an uptake of 45.6% among MSMs, surpassing the findings of our study [24]. Furthermore, a study in China reported a much lower uptake of 4% among MSMs, highlighting the contrast with our results [25].

At the time of data collection, 98% reported to have been highly sexually active in the last 6 months before enrolment on to the PrEP. 78.7% reported to have had vaginal or anal intercourse without condoms with more than 1 partner. 44.7% reported to have had a sex partner with 1 or more HIV risk factors. There was a statistically significant association only with use of PrEP and if the respondents have a sex partner with 1 or more HIV risk factors ($p=0.014$). MSM were significantly 1.4 times more likely to take PrEP compared to FSW ($p=0.011$). Also, respondents within the age range of 21 to 26 years ($p=0.002$) and 27-32 years ($p=0.007$) old had 1.03 and 0.05 significantly increased chances of taking PrEP compared to older ages respectively in this study.

Consistent with prior studies conducted in South Africa among a key population [22] our results revealed that people aged 35–44 years, and 55 years and above were less likely to experience PrEP uptake compared to those aged 21–32 years. It is noteworthy that conflicting results have been reported in other studies, where they found a positive correlation between age and PrEP uptake such as studies of Morgan,

et al [26] and Rubtsava, et al [27]. This study uncovered a high level of PrEP persistence among both FSWs and MSMs. It was also noted that living situation (such as residing with family or roommates) and age played a role in the likelihood of PrEP initiation. These results collaborated with prior studies on the factors influencing uptake, continuation, and discontinuation of oral PrEP among FSWs and MSM facilities [11,28].

Effect of PrEP as HIV/AIDS Prevention by Men Who have Sex with Men and Female Sex Workers

In this present study, a majority of 75 (50%) reported that it is 95% effective in the prevention of HIV transmission. 58 respondents (38.7%) reported that PrEP is 100% safe in preventing HIV transmission. A study in South Africa found that the vast majority of MSM surveyed were willing to take PrEP [29]. Positive perceptions of PrEP are likely to increase among MSM as exposure increases, but implementation generally achieves limited coverage in the earlier phases of these programs. Given the benefits of PrEP even at low levels of coverage in Cameroon, the program could start even with modest initiation rates and then scale with increasing demand [30]. The standalone intervention from the Yaoundé and Douala models reduced prevalence of HIV, but a standalone intervention is not expected to end HIV transmission [31]. The data presented here and elsewhere demonstrate the importance of effective integration of HIV testing with PrEP implementation given this is an HIV-status dependent intervention [32]. Individuals who are unaware of their infections are at significant risk of onward HIV transmission given higher rates of condomless sex with people at risk of HIV acquisition [33].

There was a statistically significant association between how safe PrEP use is in the prevention of HIV and socio-demographic variables such as age range ($p=0.040$), educational level ($p=0.0001$) and gender ($p=0.0001$). These results were also in line with that reported by Eisingerich, et al. [29] who found significant associations of PrEP usage with age range, and educational level.

Determinants of Discontinuity of PrEP by MSM and FSW

Recent studies and programmatic data from many countries implementing oral PrEP have highlighted challenges in promoting uptake and continuation. The highest determinant of discontinuity observed in this present study was pill burden which accounted for a percentage score of 24.7%. This was followed by the complaint that respondents reported to have been taking drugs when they are not sick which accounted for 22%. Even though 22% also reported not to have issues that may lead to discontinuity, 12%

attributed their discontinuity to forgetfulness. Significant issues with oral PrEP continuation have been identified, with 50% or more of clients discontinuing within the first one to six months of use at sites in Kenya, South Africa, and the United States [34]. Smith, et al. [35] also conducted a study in the United States among young adults using oral PrEP, and found concerns over ARV-based stigma and burden of daily pill taking, confirming the results found in this study.

From the respondents that reported to experience side effects in this present study, 20% reported to have nausea, 5.6% reported to have body weaknesses and 4% reported to have dizziness. 70.4% reported not to have or not to have experienced any side effects. Even though majority reported not to have any side effects, up to 92.0% reported that they can stop taking PrEP if they don't feel comfortable. Side effects seem to play a role in lack of uptake and discontinuation of PrEP. With regards to uptake, side effects were cited as a secondary reason for lack of initiation, following not being offered PrEP. Additionally, our results suggest that side effects were the primary reason why past users had stopped using oral PrEP within the first five months of use. Side effects have been reported as a barrier to uptake and continuation in other studies [34,36], but they were more of a concern in this study. Users in this sample who discontinued oral PrEP found side effects challenging, with many citing the side effects as intolerable and affecting daily life.

Determinants of Seroconversion by Men Who have Sex with Men (MSM) and Female Sex Worker (FSW) Who Stopped PrEP or Still on PrEP

64.7% of respondents in this study were still on PrEP. Up to 23.3% rated themselves as very high risk at the period they stopped PrEP. 10% were rated at high risk and only 2% were rated as low risk. Based on sexual behaviours, number of sexual partners, use of preventions materials, 4% were rated as very high risk, 4.7% could rate themselves as medium risk and up to 30.7% could rate themselves as low risk. Comparison between MSM and FSW with respect to risk level at the period of the diagnosis based on sexual behaviours, number of sexual partners and use of prevention materials revealed that only MSM rated themselves at very high risk and medium risk. The rate of HIV seroconversion in this analysis is closer to the incidence reported in a previous community randomized trial in two communities in Iringa among FSWs as high risk [37]. However, the seroconversion reported in our analysis is higher than the 3.45 per 100 person-years reported in Dar es Salaam in 2022 [38]. Efforts to curtail HIV acquisition among FSWs demand a strategic pivot towards prioritizing men as a focal point in prevention and treatment initiatives [39]. The dynamics of HIV transmission within the context of FSWs underscore the critical role that men play in shaping the trajectory of this

epidemic. In many settings, men are often less inclined to seek healthcare compared to women, thereby contributing to potential risks for women's health [40].

Conclusion

This study concludes that the PrEP use was at 27%. However, in MSM, the PrEP coverage was 22% while with FSW was found to be 5.3%. Interestingly, there was a statistically significant association between PrEP use between MSM and FSW in this study. MSM were significantly 1.4 time more likely to take PrEP compared to FSW. Also, it was found that respondents within the age range of 21 to 26 years and 27-32 years old had 1.03 and 0.05 significantly increased chances of taking PrEP compared to older ages respectively in this study.

Conclusion on the effect of PrEP in the prevention of HIV among men who have sex with men and female sex workers is that majority of 50% reported that it is 95% effective in the prevention of HIV transmission. 38.7% reported that PrEP is 100% safe in preventing HIV transmission. There was a statistically significant association between how safe PrEP use is in the prevention of HIV and socio demographic variables such as age range ($p=0.040$), educational level ($p=0.0001$) and gender (0.0001).

With respect to the determinants of discontinuity by MSM and FSW in the North West Region, the highest determinant of discontinuity observed in this study was pill burden which accounted for a percentage score of 24.7%. This was followed by the complaint that respondents reported to had been taking drugs when they are not sick which accounted for 22%. Even though 22% also reported not to have issues that may lead to discontinuity, 12% attributed their discontinuity to forgetfulness.

With respect to the sero conversion, this study concludes that 23.3% rated themselves as very high risk at the period they stopped PrEP. Based on sexual behaviours, number of sexual partners, use of preventions materials, 4% were rated as very high risk.

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Conflict of Interests

The authors declare that they have no competing interests.

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