What determines pre-exposure chemoprophylaxis uptake among MSM in Nairobi? A cross-sectional study

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Abstract

Background:

Pre-exposure prophylaxis (PrEP) is a biomedical approach for preventing the acquisition of HIV in populations at substantial risk for HIV. PrEP acceptability has been high among the men who have sex with men (MSM) but the uptake and adherence has been low. The study seeks to determine the determinants of PrEP uptake among the MSM.

Methods:

A cross-sectional exploratory study design was employed targeting MSM in Nairobi city and its environs. Purposive sampling was used to identify sites, where data was collected and snowballing technique employed to reach the respondents. The data was collected between November 2018 to June 2019.

Results:

Majority of the respondents were aged between 18-24 years at (64.75%). There was a significant association between frequency of HIV testing and ever used PrEP at a P- Value of 0.019. The place of last test and PrEP uptake was also associated at a P-Value of 0.019. A majority of the respondents at 181 (59.0%) indicated that they prefer blood self-test kit. Respondents who indicated that they prefer top were 132 (38.0%) with versatile being 142 (40.9%) and bottom at 73 (16.6%). Participants who were more aware of PrEP had a higher probability of taking PrEP at P-Value 0.002. There was an association between risk perception and taking PrEP at a P-Value of 0.0001. Some of the factors that hindered PrEP uptake include; Alcohol/drug use, there was a statistically significant association between anal sex after alcohol/hard drug use and never used PrEP at P-value of 0.027. Other factors include Stigma, discrimination, adherence and perceived side effects associated with the drugs.

Conclusions:

Our study shows a number of factors facilitate PrEP uptake including; being a young MSM, inconsistent condom use, frequent HIV testing, being tested for HIV in a drop in centre, reporting frequent receptive anal intercourse, being aware of PrEP, perceived high risk of HIV infection and the believe about the effectiveness of PrEP. Barriers to PrEP uptake include; concomitant PrEP use with alcohol or hard drugs, stigma, discrimination, adherence, perceived PrEP side effects and medical mistrust.

Background

Data from National AIDS Control Council (NACC) in the year 2009, shows that approximately 1.6 million Kenyans are living with HIV and over 650,000 of them are currently accessing antiretroviral treatment [1]. The current situation is compounded by the fact that close to 101,560 new infections occurs annually and an estimated 15.2% of all new HIV infections in Kenya occurred among men who have sex with men (MSM) [2]. Key populations including sex workers, MSM and people who inject drugs (PWID) contribute 35% of the new infections in Kenya and are therefore a target group for pre-exposure chemo-prophylaxis [2]. The Kenya AIDS Strategic Framework 2014/15–2018/19 (KASF) also prioritizes the key populations of MSM [3]. Kenya conducted a mapping survey of key populations in the year 2016 and through a consensus meeting estimates, there were approximately 19,175 (MSM) [4]. A recent study by UNAIDS, suggests that the likelihood of acquiring HIV is 24 times higher among (MSM) [5]. The MSM community has been receiving increasing attention as a key population but an exceptionally high incidence of HIV of approximately ten per 100 persons has been observed in male sex workers (MSW) [6]. On 8 June 2016, the United Nations (UN) General Assembly signed the political declaration on HIV and AIDS. To fulfill the aspirations of the political declaration, UNAIDS has established a 2016–2021 strategy with targets set in HIV prevention and care at the local and regional levels: an ambitious target of ensuring access to PrEP for three million people at substantial risk by 2020 [7].

Pre-exposure prophylaxis (PrEP) refers to the use of antiretroviral medications (ARVs) by HIV-negative individuals to reduce risk of HIV infection [8]. Pre-exposure prophylaxis (PrEP) using tenofovir disoproxil fumarate and emtricitabine is an exciting innovation in HIV prevention and especially among the Most at Risk Populations (MARPS). The Kenya Pharmacy and Poisons Board (PBB) approved the use of oral PrEP in Kenya in December 2015, however PrEP use in Kenya commenced in May, 2017 after the Ministry of Health (MOH) included guidance on offering PrEP to HIV negative individuals at risk of HIV-1 acquisition [9]. Global use of PrEP is currently far short of the UNAIDS goal of 3 PrEP million users by 2020 [10]. Modeling studies suggest that the impact and cost- effectiveness of PrEP will be greatest when used by populations at highest risk of infection, that is, those that have a HIV incidence of about three per 100 person-years or higher [11].

The willingness to use PrEP within the MSM community has been high but the actual uptake has been low, especially in the developing countries [13]. The current understanding of the meaning of PrEP uptake is limited, in part due to a lack of common definitions and varying interpretations of uptake and coverage measures [13]. The National AIDS & STI Control Program (NASCOP) in Kenya, tracks the number of oral PrEP initiations and uses the term uptake and coverage interchangeably. According to this measure the 'coverage' of PrEP was at 10% by end of 2017 [9]. In light of data from PrEP clinical trials and early implementation projects, crucial expectations across include uptake [14]. A recent study done in Kenya by Wahome et al., [15] calls for further research to understand the barriers and facilitators of PrEP uptake among MSM to ensure optimal interventions especially on uptake. This study seeks to better understand the barriers and facilitators of PrEP uptake within the MSM community in Nairobi and its environs.

Methods

The researcher employed a cross-sectional exploratory study design involving both quantitative and qualitative methods. The geographical scope of the study was Nairobi and Kiambu counties in Kenya. The study population was all adult men aged between 18-60 years that reported to be actively engaged in anal or oral sex with men.

Sampling techniques and sample size

The researcher recruited a total of 391 MSM respondents to complete the self-administered questionnaires. A total of 368 respondents completed the questionnaires (response rate=94%). The researcher purposively sampled eleven data collection points from sites frequented by the MSM which include the drop in centres, bars, sauna and hotels. Snow balling was then used to reach the respondents. The researcher also purposively selected five healthcare facilities for the FGD from a list of MSM friendly clinic and government healthcare facilities. Random sampling was then used to reach the reach the respondents who include the medical doctors, clinical officers, nurses and counsellors.

Data collection

All respondents completed paper based self-administered structured questionnaires between November, 2018-June, 2019 after obtaining written informed consent. We conducted four FGDs with health workers in five facilities. Each FGD had an average of ten participants and lasted between sixty to seventy-five minutes. We also conducted five FGDs with the MSM community. Each FGD had an average of twelve discussants that discussed that lasted between seventy to ninety minutes.

Data Analysis & Management

The questionnaires were numbered and data entered in SPSS Version 23.0 software data-base for analysis (IBM Corp, 2015) where variables were labeled and analysis of the data done. The data was presented in tables and graphs. Cross tabulation was done to determine the factors association with PrEP uptake among the MSM community. Further analysis of inferential statistics was conducted using Odds Ratio (OR) and Risk Ratio (RR) tests. This estimated the contribution of each of these risk factors in the outcome of PrEP uptake as a combination prevention strategy among the MSM community. Qualitative data from the FGDs both for the MSM and healthcare providers was transcribed verbatim and coded using NVIVO version 12 software (QSR International Pty Ltd; 2018). We used inductive coding to generate new categories for summarizing narratives on emerging themes from the transcripts. The themes that were similar in FGD and quantitative analysis were triangulated.

Ethical Considerations

We ensured full compliance to the research ethics codes set out in the Helsinki Declaration.

Ethical clearance for the study was obtained from University of Ghent Approval number (PA 2016/009) and the Mount Kenya University (Approval number: MKU/ERC/0463. No personal identifier for the respondents were recorded and verbal informed consent was sought before the interviews and was approved by the ethics committee. This is in-order to assure the MSM of confidentiality due to the illegal nature of homosexuality in Kenya. Data was also entered for analysis using special codes instead of the respondent's personal details.

Results

Demographics, socio-economic & HIV risk characteristics of participants.

The respondents aged 18 – 24 years had a higher proportion at 218 (64.7%) while respondents aged 25 years and above were 119 (35.3%). The respondents who identified as MSM were 305 (89.4%) and 140 (90.9%) had ever used PrEP. Those who identified themselves as MSW were 172 (50.1%) with 83 (55.0%) of them had ever used PrEP. There was a statistically significant association between anal sex after alcohol/hard drug use and never used PrEP at P-value= 0.027 with the respondents who had never used PrEP being 1.240 times likely to have had anal sex after alcohol/hard drug use. The respondents who indicated that they use condom during anal sex after alcohol/hard drug use were 157 (51.5%). The testing frequency for HIV/AIDS and ever-used PrEP had significant Chi-Square association at P-value= 0.019. The respondents who had ever-used PrEP were 1.34 times likely to test for HIV/AIDS after every 3 months. The last test in an NGO facility and ever-used PrEP had significant Chi-Square association at P-value=0.019. The respondents who had never-used PrEP were 1.28 were likely to have their last test in a public facility. The respondents who indicated that they prefer top were 132 (38.0%) with versatile being 142 (40.9%) and bottom at 73 (16.6%). The above data is available on (Table 1) below.

PrEP uptake facilitating factors.

PrEP acceptability

The respondents who indicated that based on their PrEP knowledge they would consider taking PrEP everyday while on-going risk to prevent themselves from being infected or reduce the risk of being infected were 271 (87.4%). There was a significant Chi-Square relationship between respondents who had ever used PrEP and the respondents who considered taking PrEP as one of the HIV combination prevention strategy at P-Value of 0.001.

PrEP awareness

The respondents who had ever heard of HIV negative person taking medication for prevention of infection were 298 (81.2%) indicating high prevention awareness rates with 145 (86.8%) who have ever used PrEP. There was a statistically significant Chi-Square relationship between respondents who had ever used PrEP and the respondents who had ever heard of HIV negative person taking medication for prevention of infection at P-value of 0.002.

HIV risk perception

The clients who perceived themselves to be at on-going risk of acquiring HIV virus were 195 (53.3%) and 106 (63.5%) of them had used PrEP. There was a significant Chi-Square association between respondents who had ever used PrEP and the respondents who were on-going substantial risk of acquiring HIV virus at P-Value of 0.0001.

Drugs availability

Most of the MSM respondents were able to get medication most of the times, when they visited the doctor at 129 (69.7%). Drugs availability facilitates PrEP uptake.

Perception on the effectiveness of PrEP in preventing HIV virus

A majority of the respondents affirmed that PrEP is effective in preventing one from acquiring HIV virus at 273 (86.1%) with 127 (87%) of the respondents having ever taken PrEP.

Treatment “Buddy”

About seventy seven percent (77.2%) of the interviewees indicated that if on PrEP they would prefer to have a treatment “buddy” with 104 (43.9%) among them being on PrEP.

PrEP would affect sex life

A high number of the respondents thought that PrEP would not affect their sex life at 259 (84.6), only a few at 47 (15.4%) thought that PrEP would affect sex life.

Barriers to PrEP Uptake

PrEP stigma/ discrimination

About half of the respondents experienced stigma cause of taking PrEP 56 (31.1%) with 43 (32.2%) of the respondents who had experienced stigma cause of taking PrEP having ever been on PrEP. Stigma and discrimination hinder the uptake of PrEP.

PrEP discontinuation

About fifty six percent (189) of the respondents had stopped taking PrEP while at ongoing risk. The main reason for stopping taking PrEP was cause of side effects at 40 (35 %) followed by perceived low risk, poor adherence, separation form a positive partner and partners disapproval in that order.

PrEP main concerns

When the participants were asked about the any concerns, they would have with taking PrEP they indicated the main concern was the drugs side effects, adherence, they were also concerned with time management, so as to be able to take the drugs on time due to their nature of being mobile. The above data is available on (Table 2) below.

Discussion

The use of PrEP is not lifelong and it depends on the risk for HIV, which fluctuates over time. Being able to determine PrEP un-met needs and uptake is always work in progress for project and countries. The researcher has documented a number of factors that facilitate and hinders PrEP uptake from this study.

Younger MSM were using PrEP more than the elder MSM. Our findings are in concurrence with a study conducted by Wahome et al, [16] which showed that PrEP acceptance was associated with being younger between 18–24 years. The study is also consistent with a study conducted in South Africa among the MSM which showed younger MSM are more likely to use PrEP and they are more sexually active compared to older MSM [17]. Targeting the younger MSM with PrEP will be an important HIV preventive strategy considering that more than 51% of all infections in Kenya in the year 2015, occurred among adolescent and young people aged 15–24 years a rapid rise from 29% in the year 2013 and many of those infections occurred among the key populations [2]. The same age group has reported higher levels of HIV risky behaviors such as inconsistent condom use during anal sexual intercourse and multiple sexual partners [18]. About half of the MSM respondents used condoms inconsistently. There was a significant Chi-Square association between multiple sexual partners and use of condom at P-Value of 0.03. The above data shows that MSM are using condom, especially those with multiple sexual partners the only challenge is lack of consistency which is crucial during PrEP use to reduce the chances of sero-conversion. Discussions with the MSM during the FGD showed that lack of consistent condom use during sexual intercourse influence PrEP uptake. Those MSM who did not want to use condom were taking PrEP. Our findings are in agreement with a study conducted by Mckinnon that showed that consistent condom use during receptive or insertive anal sex among the MSM was low [6]. Another study conducted among MSM in Kenya showed similar patterns of inconsistent condom use [19]. MSM have also reported decreased condom use after PrEP initiation [20]. Most of the respondents from the study were versatile at 40.9% followed by top and bottom. Receptive anal Intercourse (RAI) especially, if unprotected has been associated with increased rates of HIV acquisition [6]. Studies by Wahome et al., [21] Sanders et al., [8] showed MSM reporting RAI to have 4-9-fold increased risk of HIV-1 acquisition independent of other risk factors. Baggaley, et al., [22] documented the important role played by unprotected anal intercourse in HIV transmission, highlighting the need to include RAI when assessing PrEP eligibility within the MSM community. A study conducted in 2019 in Kenya has demonstrated higher PrEP uptake among MSM reporting receptive anal Intercourse [21]. There was a Significant Chi-Square association between respondents who had ever used PrEP and the respondents who were at on-going substantial risk of acquiring HIV virus at P- Value of 0.0001. Sexual risk is defined as having a HIV-infected sex partner, a recent STI, multiple sex partners, inconsistent or no condom use, and/or engaging in transactional sex work [23]. A study conducted in the United Kingdom (UK) in 2014, highlights how the management of risk is not limited only to HIV transmission, but also to the risk of STIs and social stigma. Participants in that study described how PrEP would not adequately address these existing risks and even had the potential to create significant new risks [24]. Another study conducted among MSM participants in sero-discordant relationships in the United States of America (USA) reported similar moral concerns about the implications of PrEP on condom use [25]. Findings from our study shows that perception of risk facilitates PrEP uptake this is consistent with a study conducted in the Zimbabwe among female sex workers [20]. The study also shows that frequent HIV testing facilitates PrEP uptake. The testing frequency for HIV/AIDS and ever-used PrEP had significant Chi-Square association at P-value of 0.019. The respondents who had ever-used PrEP were 1.350 times likely to test for HIV/AIDS after every 3 months. HIV testing in an NGO facility aids in the uptake of PrEP. The last HIV test in an NGO facility and ever-used PrEP had significant Chi-Square association at P-value of 0.019. The respondents who had never-used PrEP were 1.28 times likely to have their last test in a public facility.

There was a statistically Significant Chi-Square relationship between respondents who had ever used PrEP and the respondents who had ever heard of HIV negative person taking medication for prevention of infection at P- Value of 0.002. Majority of the respondents who had heard about PrEP indicated that they heard it from a friend or partner, social media and from website/research publication. PrEP awareness is important in increasing uptake. Liu et al., [12] identifies accurate consumer knowledge as key to PrEP implementation and use in addition to addressing other factors such as stigma, adherence and risk reduction. About (87.4%) of the respondents would consider taking PrEP everyday while at ongoing risk. There was a significant Chi-Square relationship at a P-Value of 0.001 between respondents who had ever used PrEP and the respondents who considered taking PrEP as one of the HIV combination prevention strategy. Our findings are slightly higher than a study conducted in Kenya, 2016 that showed willingness to take oral PrEP at (83%) (18). A majority of the study respondents affirmed that PrEP is effective in preventing one from acquiring HIV virus and hence would facilitate PrEP uptake. Our study findings on perception of PrEP effectiveness differs from a study conducted in the UK that shows that PrEP effectiveness emerged as a barrier to potential use of PrEP. Participants from the UK study expressed concerns that PrEP provided less than 100% protection and therefore was insufficient to prevent HIV transmission on its own. They felt that PrEP used alone was too much of a risk, if only approximately 70% effective [24]. Other participants thought that the advice to use PrEP with condoms indicated a continued scientific uncertainty. A significant number of the respondents thought that PrEP would not affect their sex life at 259 (84.6%). This is an important factor in increasing PrEP uptake. Our findings are in agreement with a study conducted among gay bisexual men in HIV sero-discordant male relationships that showed that the use of PrEP was associated with comfort during sex with a HIV sero-discordant partner [26]. Another key facilitator of PrEP uptake is support through friend during the chemo-prophylaxis. Seventy seven percent of the respondents indicated that, if on PrEP they would prefer to have a treatment “buddy”. A study by Gombe et, al., also shows how critical support, whether from partners, family members and friends is to PrEP uptake and adherence [20]. Most of the MSM respondents were able to get medication most of the times they visited their doctors at 129 (69.7%. Drugs availability facilitates PrEP uptake.

A number of factors hinder PrEP uptake and should be addressed to increase the number of MSM taking up and sustaining PrEP usage. There was a statistically significant association between anal sex after alcohol/hard drug use and never used PrEP at P-value of 0.027. Our findings are consistent with a study conducted in Kenya among the MSM that shows that use of alcohol and other drugs affects PrEP adherence and consistent condom use [27]. Homosexuality is illegal in Kenya and can carry a prison sentence of up to 14 years [28]. This coupled with entrenched social attitudes, leads to high levels of stigma and discrimination, hence acting as a barrier to healthcare services uptake including PrEP. About 56 (31.1%) of the respondents experienced stigma or discrimination cause of taking PrEP. A 2017 study amongst healthcare workers in Mombasa and Kilifi, identified a range of discriminatory practices. For example, some healthcare workers reported facing discrimination from colleagues for tending to MSM [29]. Most of the respondents indicated that the main reason for stopping taking PrEP was cause of side effects at 40 (35%) followed by perceived low risk, poor adherence, separation from a positive partner and partners disapproval in that order. Other reasons given for discontinuing PrEP during the FGD include; Pill burden, preferring condoms and mistrusting medical science on PrEP, since it’s not 100% effective. The above reasons for discontinuing PrEP are also supported by another study conducted in Zimbabwe [20]. Given the evidence concerning the patterning of efficacy by adherence, maintaining regular adherence to medication by the MSM was identified as a potential barrier to effective PrEP use [24]. One of the MSM respondents said that taking PrEP daily was similar to taking ARV drugs daily, *“What’s the difference of taking medications of PREP every day it’s like am taking ARVs every day? So, I can just continue that way, enjoying my sex life every day until I get infected with HIV, so that I can start taking ARVs.”* (MSM FGD Transcript). A significant number of the MSM also thought that PrEP lowers immunity. Our study has a number of limitations. Reliance on self-reported data can be subject to numerous biases and the HIV status of the participants was self-reported and was not verified during the study.

Conclusions

The effectiveness of PrEP is dependent on a number of factors including acceptability, accessibility, uptake and sustainability as part of a comprehensive HIV prevention package. If the above components are not there, even the most highly efficacious PrEP medication will have little to no impact in reducing HIV infections within the MSM community [26]. Our results show that MSM who are at high risk of HIV infections are interested in taking up PrEP. A number of factors facilitate PrEP uptake including; being a young MSM, inconsistent condom use, frequent HIV testing, being tested for HIV in a drop in centre or in an NGO supported facility, reporting frequent receptive anal intercourse, being aware of PrEP, perceived high risk of HIV infection and the believe about the effectiveness of PrEP. Barriers to PrEP uptake include concomitant drugs use with alcohol or hard drugs, stigma and discrimination, adherence, perceived PrEP side effects and medical mistrust. The findings from this study provide crucial insights into the issues; policy makers, ministries of health and healthcare workers should consider to increase and sustaining PrEP uptake within the MSM community.

Abbreviations

ART- Antiretroviral Therapy

AIDS- Acquired Immunodeficiency Syndrome

HIV- Human Immunodeficiency Virus

HIVST- Human Immunodeficiency Virus self -test

MSM-Men who have sex with men

MSW-Men sex workers

PrEP-Pre-exposure prophylaxis

PEP-Post exposure prophylaxis

Declarations

Ethics approval and consent to participate

Clearance for the study was obtained from Ghent University PA 2016/009 and Mount Kenya University Ref. No. MKU/ERC/0463. Verbal informed consent was sought before the interviews due to the illegal nature of homosexuality in Kenya and was approved by the ethics committee.

Consent for publication

Not applicable

Availability of data and materials

The datasets supporting the conclusions of this article are included within the article and its additional files. The attached questionnaire was developed purposely for this study.

Competing interests

The author declares no competing interests.

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Authors' contributions

All authors made significant contribution in the conceptualization and design of this study.

KN was responsible for the formulation of the study, conducting data collection, analyzing and developing the paper. GP and TM reviewed the paper and provided technical advice. All authors read and approved the final manuscript.

Disclaimer

The views and opinions expressed herein belong to the authors alone.

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Tables

Table 1: Demographics, socio-economic & HIV risk characteristics of participants

Crosstab						Risk Estimate			
		Ever used PrEP		Total n (%)	P-Value		Value	95% Confidence Interval	
		No n (%)	Yes n (%)					Lower	Upper
Respondents age	18 - 24	117 (63.6)	101 (66.0)	218 (64.7)	0.64	Odds Ratio for Respondents age (18 - 24 / 25 +)	0.899	0.574	1.409
	25 +	67 (36.4)	52 (34.0)	119 (35.3)		For cohort Ever used PrEP = No	0.953	0.780	1.165
Total		184 (54.6)	153 (45.4)	337		For cohort Ever used PrEP = Yes	1.060	0.827	1.360
Education level	At-least Secondary education	127 (64.1)	94 (57.3)	221 (61.0)	0.185	Odds Ratio for Education level (At least Secondary education / Tertiary)	1.332	0.871	2.036
	Tertiary	71 (35.9)	70 (42.7)	141 (39.0)		For cohort Ever used PrEP = No	1.141	0.935	1.393
Total		198 (55)	164 (45)	362		For cohort Ever used PrEP = Yes	0.857	0.683	1.074
Monthly income	Less 6,000	59 (53.2)	45 (45.5)	104 (49.5)	0.265	Odds Ratio for Monthly income (Less 6,000 / 6,000 +)	1.362	0.791	2.345
	6,000 +	52 (46.8)	54 (54.5)	106 (50.5)		For cohort Ever used PrEP = No	1.156	0.895	1.495
Total		111 (54.0)	99 (46.0)	210		For cohort Ever used PrEP = Yes	.849	0.636	1.134
Identify as MSM	No	22 (11.8)	14 (9.1)	36 (10.6)	0.42	Odds Ratio for Identify as MSM (No / Yes)	1.333	0.658	2.704
	Yes	165 (88.2)	140 (90.9)	305 (89.4)		For cohort Ever used PrEP = No	1.130	0.853	1.495
Total		187 (54.0)	154 (46.0)	341		For cohort Ever used PrEP = Yes	0.847	0.553	1.299
Identity MSW	No	103 (53.6)	68 (45.0)	171 (49.9)	0.113	Odds Ratio for Identity MSW (No / Yes)	1.413	0.921	2.167
	Yes	89 (46.4)	83 (55.0)	172 (50.1)		For cohort Ever used PrEP = No	1.164	0.964	1.406
Total		192 (56.0)	151 (44.0)	343			0.824	0.648	1.048
Sexual partners last 6 months	One	40 (20.7)	33(21.0)	73(21.9)	0.946	Odds Ratio for Sexual partners last 6 months (One / 1)	0.982	0.585	1.649
	Multiple	153(79.3)	124(79.0)	277(79.1)		For cohort Ever used PrEP = No	.992	0.785	1.253
Total		193(56.0)	157(45.0)	350		For cohort Ever used PrEP = Yes	1.010	0.760	1.342
Use condom	No	22 (11.3)	9 (5.8)	31 (8.9)	0.068	Odds Ratio for	2.089	0.933	4.678

during sex						Use condom during sex (No / Yes)			
	Yes	172 (88.7)	147 (94.2)	319 (91.1)		For cohort Ever used PrEP = No	1.316	1.028	1.685
Total		194 (55.0)	156 (45.0)	350		For cohort Ever used PrEP = Yes	0.630	0.359	1.106
condom during sex	Consistently	105 (60.7)	80 (53.3)	185 (57.3)	0.182	Odds Ratio for If yes how often do you use condom during sex (Consistently / Inconsistently)	1.351	0.868	2.104
	Inconsistently	68 (39.3)	70 (39.7)	138 (39.3)		For cohort Ever used PrEP = No	1.152	0.933	1.422
Total		173 (54.0)	150 (46.0)	323		For cohort Ever used PrEP = Yes	0.853	0.675	1.076
Had anal sex after alcohol/hard drug use	No	93 (49.7)	57 (37.7)	150 (44.4)	0.027	Odds Ratio for Had anal sex after alcohol/hard drug use (No / Yes)	1.632	1.055	2.524
	Yes	94 (50.3)	94 (62.3)	188 (55.6)		For cohort Ever used PrEP = No	1.240	1.025	1.500
Total		187 (55.0)	151 (45.0)	338		For cohort Ever used PrEP = Yes	0.760	0.592	0.975
Do you use condom during anal sex after alcohol/hard drug use	Consistently	91 (55.2)	66 (47.1)	157 (51.5)		Odds Ratio for Do you use condom during anal sex after alcohol/hard drug use (Consistently / Inconsistently)	1.379	0.877	2.167
	Inconsistently	74 (44.8)	74 (52.9)	148 (48.5)		For cohort Ever used PrEP = No	1.159	0.941	1.429
Total		165 (54.0)	140 (46.0)	305	0.163	For cohort Ever used PrEP = Yes	.841	0.659	1.073
Did you use lubricant in last sexual act	No	33 (17.4)	17 (10.8)	50 (14.4)	0.08	Odds Ratio for Did you use lubricant in last sexual act (No / Yes)	1.743	0.931	3.266
	Yes	157 (82.6)	141 (89.2)	298 (85.6)		For cohort Ever used PrEP = No	1.253	0.999	1.571
Total		190 (55.0)	158 (45.0)	348		For cohort Ever used PrEP = Yes	0.719	0.480	1.077
Type of lubricant in last sexual act	KY Jelly	98 (60.5)	96 (67.1)	194 (63.6)	0.229	Odds Ratio for Type of lubricant in last sexual act (KY Jelly / None water based)	0.750	0.469	1.200
	None water based	64 (39.5)	47 (32.9)	111 (36.4)		For cohort Ever used PrEP = No	0.876	0.709	1.083
Total		162 (53.0)	143 (47.0)	305		For cohort Ever used PrEP = Yes	1.169	0.902	1.515
Ever tested for HIV/AIDs	No	13 (6.5)	5 (3.0)	18 (4.9)	0.121	Odds Ratio for Ever tested for	2.252	0.786	6.454

						HIV/AIDs (No / Yes)			
	Yes	187 (93.5)	162 (97.0)	349 (95.1)		For cohort Ever used PrEP = No	1.348	0.996	1.824
Total		200 (54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	0.598	0.282	1.271
If yes how often do you test for HIV/AIDS	Every 3 months	123 (61.5)	122 (73.1)	245 (66.8)	0.019	Odds Ratio for If yes how often do you test for HIV/AIDS (Every 3 months / Greater than 3 months)	0.589	0.378	0.919
	Greater than 3 months	77 (38.5)	45 (26.9)	122 (33.2)		For cohort Ever used PrEP = No	0.795	0.662	0.956
Total		200 (54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	1.350	1.037	1.758
Results of the most recent HIV test	Negative	141 (70.5)	139 (83.2)	280 (76.3)	0.004	Odds Ratio for Results of the most recent HIV test (Negative / Positive)	0.481	0.290	.799
	Positive	59 (29.5)	28 (16.8)	87 (23.7)		For cohort Ever used PrEP = No	0.743	0.617	.894
Total		200 (54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	1.542	1.112	2.139
Considered window period in deciding when to test	No	121 (60.5)	78 (46.7)	199 (54.2)	0.008	Odds Ratio for If yes considered window period in deciding when to test (No / Yes)	1.748	1.153	2.648
	Yes	79 (39.5)	89 (53.3)	168 (45.8)		For cohort Ever used PrEP = No	1.293	1.063	1.572
Total		200 (54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	0.740	0.591	0.926
If yes where did you do the last test	Public	64 (36.0)	36 (24.0)	100 (30.5)	0.019	Odds Ratio for If yes where did you do the last test (Public / Private)	1.778	1.096	2.884
	Private	114 (64.0)	114 (76.0)	228 (69.5)		For cohort Ever used PrEP = No	1.280	1.052	1.557
Total		178 (54.0)	150 (46.0)	328		For cohort Ever used PrEP = Yes	0.720	0.538	0.964
Consider taking up HIV self-test	No	45 (22.5)	43 (25.7)	88 (24.0)	0.468	Odds Ratio for Consider taking up HIV self-test as one of the HIV combination prevention strategy (No / Yes)	0.837	0.518	1.353
	Yes	155 (77.5)	124 (74.3)	279 (76.0)		For cohort Ever used PrEP = No	0.920	0.732	1.158
Total		200 (54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	1.099	0.856	1.413
Would prefer to use the Oral or Blood self-test kit	Oral self-test kit	69 (40.1)	57 (42.2)	126 (41.0)	0.71	Odds Ratio for Would prefer to use the Oral or	0.917	0.580	1.449

						Blood self-test kit (Oral self-test kit / Blood self-test kit)			
	Blood self-test kit	103 (59.9)	78 (57.8)	181 (59.0)		For cohort Ever used PrEP = No	0.962	0.785	1.179
Total		172 (56.0)	135 (44.0)	307		For cohort Ever used PrEP = Yes	1.050	0.814	1.354
If on PrEP would you still use condom	No	27 (15.9)	16 (11.0)	43 (13.6)	0.203	Odds Ratio for If on PrEP would you still use condom (No / Yes)	1.534	0.791	2.975
	Yes	143 (84.1)	130 (89.0)	273 (86.4)		For cohort Ever used PrEP = No	1.199	0.928	1.549
Total		170 (54.0)	146 (46.0)	316		For cohort Ever used PrEP = Yes	0.781	0.520	1.175
The circumstances that made you take PrEP	Rape	2 (4.5)	10 (12.3)	12 (9.6)	0.596				
	Condom burst	29 (65.9)	49 (60.5)	78 (62.4)					
	Needle pricking	4 (9.1)	4 (4.9)	8 (6.4)					
	Gender based violence	1 (2.3)	1 (1.2)	2 (1.6)					
	Other	8 (18.1)	17 (21.1)	25 (20.0)					
Total		44 (35.0)	81 (65.0)	125					
Sexual Orientation	Homosexual	112 (59.3)	116 (75.3)	228 (66.5)					
	Bisexual	64 (33.9)	30 (19.5)	94 (27.4)					
	Heterosexual	6 (3.2)	2 (1.3)	8 (2.3)					
	Other	7 (3.7)	6 (3.9)	13 (3.8)					
Total		189 (55.0)	154 (45.0)	343	0.012				
Prefer top or bottom	Top	68 (35.6)	64 (41.0)	132 (38.0)	0.185				
	Bottom	47 (24.6)	26 (16.7)	73 (16.6)					
	Both/versatile	76 (39.8)	66 (42.3)	142 (40.9)					
Total		191 (55.0)	156 (45.0)	347					
	Had unprotected anal sex	32 (19.4)	40 (27.3)	72 (23.2)	0.018				
	Had physical discomfort	17 (10.3)	6 (4.1)	23 (7.4)					
Total		165 (53.0)	146 (47.0)	311					
The circumstances that made you take PrEP	Rape	2 (4.5)	10 (12.3)	12 (9.6)					
	Condom burst	29 (65.9)	49 (60.5)	78 (62.4)					

	Needle pricking	4 (9.1)	4 (4.9)	8 (6.4)	
	Gender based violence	1 (2.3)	1 (1.2)	2 (1.6)	
	Other	8 (18.1)	17 (21.1)	25 (20.0)	
Total		44 (35.0)	81 (65.0)	125	0.596

Table 2: PrEP uptake facilitating & hindering factors.

		Ever used PrEP		Total		Risk Estimate			
		No	Yes		Chi-Square Tests P-Value		Value	95% Confidence Interval	
		n (%)	n (%)	n (%)				Lower	Upper
Based on your PrEP knowledge would you consider taking PrEP everyday while on-going risk	No	21 (12.7)	18 (12.4)	39 (12.6)		Odds Ratio for Based on your PrEP knowledge would you consider taking PrEP everyday while on-going risk	1.029	0.525	2.017
	Yes	144 (87.3)	127(87.6)	271 (87.4)		For cohort Ever used PrEP = No	1.013	0.742	1.383
Total		165 (53.0)	145 (47.0)	310	0.934	For cohort Ever used PrEP = Yes	0.985	0.686	1.414
Ever heard of HIV negative person taking medication for prevention of infection	No	47 (23.5)	22 (13.17)	69 (18.8)		Odds Ratio for Ever heard of HIV negative person taking medication for prevention of infection (No / Yes)	2.025	1.162	3.527
	Yes	153(76.5)	145 (86.8)	298(81.2)		For cohort Ever used PrEP = No	1.327	1.091	1.613
Total		200(54)	167 (46)	367	0.002	For cohort Ever used PrEP = Yes	0.655	0.455	0.943
Do you think you are at on-going risk of acquiring HIV virus	No	110 (55.3)	61 (36.5)	171 (46.7)		Odds Ratio for at on-going risk of acquiring HIV virus (No / Yes)	2.148	1.410	3.272
	Yes	89 (44.7)	106 (63.5)	195 (53.3)		For cohort Ever used PrEP = No	1.409	1.166	1.704
Total		199 (54)	167 (46)	366	0.0001	For cohort Ever used PrEP = Yes	0.656	0.517	0.833
Consider taking PrEP as one of the HIV combination Prevention strategy	No	44 (22.0)	24 (14.4)	68 (18.5)	0.001	Odds Ratio for Consider taking PrEP as one of the HIV combination Prevention strategy (No / Yes)	1.681	0.973	2.903

	Yes	156 (78.0)	143 (85.6)	299 (81.5)		For cohort Ever used PrEP = No	1.240	1.009	1.524
Total		200(54.0)	167 (46.0)	367		For cohort Ever used PrEP = Yes	0.738	0.524	1.040
Ever experienced stigma/discrimination cause of taking PrEP	No	36 (73.5)	88 (67.2)	124 (68.9)		Odds Ratio for Ever experienced stigma cause of taking PrEP (No / Yes)	1.353	0.651	2.812
	Yes	13 (26.5)	43 (32.2)	56 (31.1)		For cohort Ever used PrEP = No	1.251	0.721	2.168
Total		49 (27.0)	131(73.0)	180		For cohort Ever used PrEP = Yes	0.924	0.770	1.110
Ever visited your doctor and missed to get your drugs	No	36 (66.7)	93 (71.0)	129 (69.7)	0.0417	Odds Ratio for Ever visited your doctor and missed to get your drugs (No / Yes)	0.817	0.414	1.613
	Yes	18 (33.3)	38 (29.0)	56 (30.3)	0.560	For cohort Ever used PrEP = No	0.868	0.542	1.390
Total		54 (29.0)	131 (71.0)	(185)		For cohort Ever used PrEP = Yes	1.062	0.861	1.310
PrEP is effective in preventing one from acquiring HIV virus	No	25 (14.6)	19 (13.0)	44 (13.9)	0.680	Odds Ratio for PrEP is effective in preventing one from acquiring HIV virus (No / Yes)	1.145	0.602	2.175
	Yes	146 (85.4)	127 (87.0)	273 (86.1)		For cohort Ever used PrEP = No	1.062	0.803	1.406
Total		171 (54.0)	146 (46.0)	317		For cohort Ever used PrEP = Yes	0.928	0.646	1.333
If on PrEP would you still use condom	No	27 (15.9)	16 (11.0)	43 (13.6)		Odds Ratio for If on PrEP would you still use condom (No / Yes)	1.534	0.791	2.975
	Yes	143 (84.1)	130 (89.0)	273 (86.4)		For cohort Ever used PrEP = No	1.199	0.928	1.549
Total		170 (54.0)	146 (46.0)	316		For cohort Ever used	0.781	0.520	1.175

					0.203	PrEP = Yes			
If you were on PrEP would you prefer to have a treatment "buddy"	No	34 (20.4)	36 (25.7)	70 (22.8)	0.265	Odds Ratio for If you were on PrEP would you prefer to have a treatment "buddy" (No / Yes)	0.739	0.433	1.260
	Yes	133 (79.6)	104 (74.3)	237 (77.2)		For cohort Ever used PrEP = No	0.866	0.663	1.129
Total		167 (54.0)	140 (46.0)	307		For cohort Ever used PrEP = Yes	1.172	0.895	1.534
Taking PrEP would affect your sex life	No	138 (84.7)	121 (84.6)	259 (84.6)		Odds Ratio for Taking PrEP would affect your sex life (No / Yes)	1.004	0.538	1.871
	Yes	25 (15.3)	22 (15.4)	47 (15.4)		For cohort Ever used PrEP = No	1.002	0.748	1.341
Total		163 (53.0)	143 (47.0)	306	0.991	For cohort Ever used PrEP = Yes	0.998	0.717	1.390
Ever visited your doctor and missed to get your drugs	No	36 (66.7)	93 (71.0)	129 (69.7)	0.56	Odds Ratio for Ever visited your doctor and missed to get your drugs (No / Yes)	0.817	0.414	1.613
	Yes	18 (33.3)	38 (29.0)	56 (30.3)		For cohort Ever used PrEP = No	0.868	0.542	1.390
Total		54 (29)	131 (71)	185		For cohort Ever used PrEP = Yes	1.062	0.861	1.310
If ever used PrEP have you ever stopped	No	77 (45.6)	69 (41.6)	146 (43.6)		Odds Ratio for If ever used PrEP have you ever stopped (No / Yes)	1.177	0.764	1.813
	Yes	92 (54.4)	97 (58.4)	189 (56.4)		For cohort Ever used PrEP = No	1.083	0.876	1.340
Total		169 (50.4)	166 (49.6)	335	0.544	For cohort Ever used PrEP = Yes	0.921	0.739	1.148
If ever stopped taking PrEP. what are the reasons for stopping	Side effect	4 (19.0)	36 (39.6)	40 (35.7)	0.566				
	Partner disapproval	2 (9.5)	7 (7.7)	9 (8.0)					
	Perceived low risk	2 (9.5)	16 (17.6)	18 (16.1)					

	Separation from a positive partner	4 (19.0)	8 (8.8)	12 (10.7)		
	Stigma	4 (19.0)	2 (2.2)	6 (5.4)		
	Poor adherence	2 (9.5)	12 (13.2)	14 (12.5)		
	Patient choice	3 (14.3)	8 (8.8)	11 (9.8)		
	Side effect & Patient choice	0	2 (2.2)	2 (1.8)		
Total		21 (19.0)	91 (81.0)	112		
What concerns would you be having on the use of PrEP	Adherence	2 (8.0)	3 (15.0)	5 (11.0)		
	Availability	0	2 (10.0)	2 (4.0)		
	Expensive	0	1 (5.0)	1 (2.0)		
	Need more information on PrEP	3 (12.0)	0	3 (7.0)		
	Stigma	0	1 (5.0)	1 (2.0)		
	Sustainability	0	1 (5.0)	1 (2.0)		
	Time management	3 (12.0)	1 (5.0)	4(9.0)		
	Side effects	17 (65.0)	11 (55.0)	28(61.0)		
	Effective way of HIV transmission	1(4.0)	0	1(2.0)		
Total		26 (57.0)	20 (43.0)	46	0.031	

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- PrEPUptakeDatabase.xlsx
- QuestionnaireforPrEPuptakeamongMSM.docx