Predictors and Frequency of STIs among MSM on PrEP in Kiambu County, Kenya

Caleb Momanyi Ombati[1*], Alloys Sigar Stevens Orago[2] and Rosebella Alungata Iseme[3]

[1] Department of Community Health and Epidemiology, School of Public Health of Kenyatta University; [2] Department of Pathology, School of Health Sciences of Kenyatta University and [3] Department of Population Health, Medical College, Aga Khan University, Nairobi, Kenya

***Corresponding author:** Caleb Momanyi Ombati. Email address: ombaticaleb@gmail.com

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Abstract

BACKGROUND

Men who have sex with men (MSM) face a high burden of sexually transmitted infections, hence form a vital target population for public health response. The primary objective of this study was to determine the frequency and predictors of selected sexually transmitted infections among men who have sex with using pre-exposure prophylaxis (PrEP) in Kiambu County.

MATERIALS AND METHODS

An analytical cross-sectional study design was and MSM currently using PrEP were enrolled. Venue-based sampling was adopted and a sample size of 157 respondents was included in the survey. A total of 4 key informant interviews were conducted and 3 focus group discussions comprising 11, 8 and 7 members respectively provided additional information regarding PrEP use and sexually transmitted infections (STI). Data was analyzed using Stata version 17.

RESULTS

STI prevalence was 37.5%, with the highest rates observed for co-morbidities of chlamydia and gonorrhoea at 47.9%, and genital warts at 31.3%. Other prevalent STIs included chlamydia (10.4%), chlamydia with genital warts (4.2%), syphilis (4.2%), and gonorrhea (2.1%).. Missing to take PrEP was not significantly associated with STI prevalence [p=0.093]. However, the regression analysis indicated significant associations between STI prevalence and the type of sexual typologies for combined anal, oral and bisexual sex, (p=0.022), similar to anal and bisexual (p=0.008) and anal and oral (p=0.011). Failing to notify one's partner of testing positive for an STI also had a significant association with STI prevalence [p=0.013].

CONCLUSION

The study concluded that STI prevalence among MSM on PrEP was associated with sexual typologies of anal, oral, and bisexual sex, and failing to notify one's partners after turning positive for an STI.

RECOMMENDATION

The study recommends the Ministry of Health and partners reach MSM on PrEP with health services geared to lower the STI transmission rates and with persistent messaging encouraging continuous condom use and sharing of best strategies for and importance of partner notification.

Keywords: *Sexually transmitted infections, Men who have sex with men, Pre-exposure prophylaxis, Prevalence*

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Introduction

Men who have sex with men (MSM) continue to brace a disproportionately high burden of sexually transmitted infections (STIs) globally such as *Chlamydia trachomatis* (CT), *Neisseria gonorrhoeae* (NG), or *Treponema pallidum* (TP) (1). Quite often, STIs are asymptomatic and most of the time they go undetected and therefore, untreated (2). This poses a danger in terms of ongoing reservoirs for transmission. Global data indicates that the chances of MSM acquiring human

immunodeficiency virus (HIV) are 28 times higher when compared to the general population (3). African countries like Nigeria, Tanzania, Kenya, and South Africa with MSM-centered programs have generated data on STI prevalence being at 35.2%, 27.1%, 24.6% and, 33.5% respectively contributing towards increased mortality and morbidity in the countries (4).

The use of PrEP is recommended among high-risk populations (5). In Kenya, various studies have provided data on the prevalence as well as the incidence of HIV amongst different cohorts of MSM (6,7,8). Data from the Kenya Health Information System (KHIS, 2020) indicates that Kiambu County has a total of 4,783 people currently on PrEP and MSM representing 29% of that population, with a reported increment of STIs by 14% (9). A study by the National AIDS and STIs Control Programme (10) indicated that 35% of the MSM currently on PrEP had recorded a 21% increase in the prevalence of STIs at the national level. The STI prevalence among the general population was 4.9 times lower when compared to that of MSM in Kiambu. Moreover, when compared to the national data, the prevalence among MSM in Kiambu was 3.4 times higher (10).

The NASCOP study indicates that individual, health facility and health policy factors led to high STI prevalence (10) and a similar study by Blackwell in Kiambu points out the clinical aspect of PrEP adherence causing STI increase to 17% and inconsistent condom use increasing by 23% (21). The gaps from these studies failed to delve into the sexual behavioural patterns like number and type of sexual partners, sexual acts and clinical factors on disclosure of STI status upon turning positive and frequency of screening to predict their influence on STI prevalence among MSM on PrEP in Kiambu county. The objectives of the study included determining the prevalence of selected STIs (CT, NG and TP), establishing whether the sexual behavioural patterns are associated with the prevalence of selected STIs, describing the clinical characteristics and establishing whether there is a relationship between the clinical characteristics and the prevalence of STIs among MSM currently on PrEP in Kiambu County.

Materials and Methods

Research design and location

This study used an analytical cross-sectional study design to guide in determining the factors associated with the occurrence of STIs. Study participants were drawn from the Mamboleo Peers Empowerment Programme (MPEG), located in Kiambu County. The selection of MPEG was due to its active presence within the 12 sub-counties and that it offered sexual reproductive services, and psychosocial and economic empowerment to the target population.

Sampling technique and sample size determination

Venue-based sampling was used to select the participants. The selection of the MPEG programme was purposive as more than 36% of the MSM in the County access PrEP and other sexual health services there.

The desired sample size was determined using Fischer formulae (11):

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where; n was the size of the sample, Z was the Standard variance at a confidence level given as 1.96 at a 95% confidence level; P was the proportion of the population with the variable that was being measured (0.15), and d was the acceptable margin of error and given as 0.05,

$$n = \frac{1.96^2 x\ 0.15(1-0.15)}{0.05^2}$$
$$= 196\ MSM\ respondents$$

The formula was adjusted for a small population (< 10,000) therefore:

$$Desired\ sample\ size\ (nf) = \frac{n}{1+\frac{n}{N}}$$

Where nf was the desired sample size, n was the constant [196]. N was the total number of MSM from which the sample was derived. A 10% non-response allowance was given to the sample size making 157 respondents.

The study had three homogenous focused group discussions (FGD) consisting, of young MSM, 18-29 years, MSM 30 years and above and the third group of MSM of mixed ages, selected from the larger pool of the quantitative participants and 4 key informants comprising MSM program coordinator and officers all purposively selected as they worked in MPEG project. Some of the specific themes and questions for KIIS and FGDs were frequency of testing and screening for STIs, PrEP uptake, sexual partners, common sexual acts and condom use.

Participant recruitment

MSM mobilizers were used to bring their peers for the quarterly visits and during the data collection period. The participants were approached to participate in the study and those who consented took part in the KIIs and FGDs.

Data collection techniques

Data collection was through administering questionnaires, KIIs, and FGDs. A research assistant was trained on the study aim, methodology, data quality and maintaining ethical standards of the study. The lead researcher conducted the KIIs and FGDs.

Data analysis

Quantitative data was analyzed using Stata v17 and descriptive statistics were presented using frequencies and proportions. Bivariate analysis was done using the chi-square test, and Fisher's exact test was used for counts <5. Logistic regression analysis was used for multivariate analysis, with a p-value of <0.05 considered significant. Qualitative data from FGDs and KIIs was transcribed and analyzed using NVIVO v12 by writing summary memos, developing a coding strategy, and having broad themes through a deductive approach to make conclusions.

Ethical considerations

Approval to conduct the study was obtained from the Kenyatta University Ethics Review Committee (REF: PKU/2353/11491), National Council for Science, Technology and, Innovations (NACOSTI/P/21/13973) and MPEG Research Division. Informed consent was obtained from the study participants. Confidentiality of data was observed through coding questionnaires and data collected was password protected, kept under lock and key, and only accessed by the researcher and research assistant.

Results

Response rate

A total of 157 MSM were enrolled into the study, however, only 129 respondents provided consent and participated in data collection thus, a response rate of 82.2% (above the 80% threshold deemed acceptable for survey research). For the qualitative interviews, 4 key informants (MSM program coordinator and officers) were interviewed, and three FGDs were conducted (11, 8 and 7 members respectively).

Socio-demographic characteristics

The respondents aged 21-29 years were the majority (62.8%) and most were single (87.6%). All the participants had attained some level of education; primary (8.5%), secondary (35.7%), and tertiary (55.8%). The majority (52.7%) were self-employed with an average monthly income, of KES 16,000.

Prevalence of sexually transmitted infections

In the last three months of the data collection period, 37.5% of the respondents were diagnosed with an STI, and among those diagnosed, 49.9% had contracted both chlamydia & gonorrhoea, 31.3% had contracted genital warts and 10.3% chlamydia.

Table 1:
Respondents' Socio-Demographic Characteristics

Variable	Category	Frequency (n)	Mean (SD)
Age	18-20	20(15.5)	$\bar{x}$=24 SD=15.06475
	21-29	81(62.8)	
	30-39	26(20.2)	
	40-49	2(1.6)	
	Total	129(100)	
Marital status	Divorced	1(0.8)	
	Married	15(11.6)	
	Single	113(87.6)	
	Total	129(100)	
Level of education	Primary	11(8.5)	
	Secondary	46(35.7)	
	Tertiary	72(55.8)	
	Total	129(100)	
Occupation	Government/ private employed	24(18.6)	
	Not Employed	14(10.9)	
	Self-employed	68 (52.7)	
	Student	22(17.1)	
	Did not select	1(0.8)	
	Total	129(100)	
Average monthly Income	Less than 10,000	23(17.8)	16,000
	10,001-20,000	34(26.4)	
	20,001-30,000	21(16.3)	
	More than 30,000	28(21.7)	
	Did not select	23(17.8)	
	Total	129(100)	

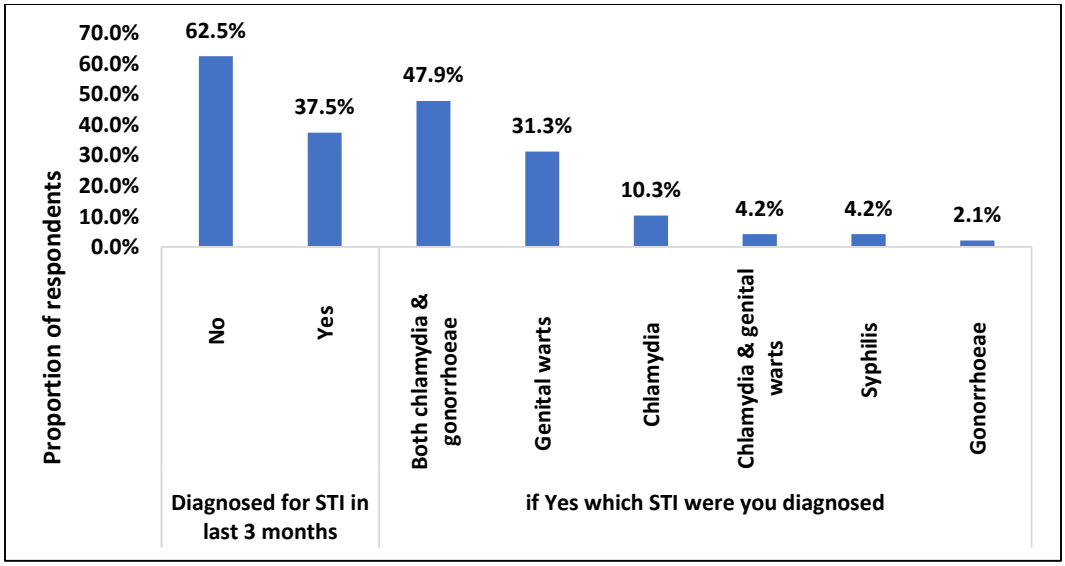

Figure 1:
Prevalence and identification of STIs

Association between socio-demographic characteristics and STI prevalence

The participants aged 21-29 years were significantly associated with an STI prevalence of 75.0% [p=0.035]. Being single was significantly associated with contracting STIs (64.3%) [p=0.035]. The education level was not associated with STI diagnosis (63.4%) [p=0.406], similar to the occupation (70.8%) [p=0.206] as illustrated in table 4.2.

The study findings agree with the two key informants who said:

'*An MSM who is working or educated does not necessarily mean that they will contract STIs and this is linked to the exposure and empowerment the individuals get on awareness for information, thus able to make informed choices like condom use'.*

Sexual behavioural patterns

The findings indicated PrEP use for 3-5 months (12.4%), 6-8 months (37.2%), and 9-12 months (31.0%). The main reasons for missing taking PrEP included forgetfulness (22.2%), drugs being out of stock (13.03%), and being too busy to keep appointments (61.1%).

The findings from FGDs agree with these findings and are summarized as:

"*Some of us do miss taking our PrEP drugs because of travelling long distances and forgetting to carry them, at times we may have family gatherings making the environment not so good because many people are around and sometimes being occupied with other jobs".*

The frequency of using condoms with paying clients was 53.9%, while 46.1% was never or rarely used. With regular clients 32.6% and 67.4% respectively always used or never/rarely used condoms. The majority of sexual acts per week and sexual partners were five and above 83.0% and 79.5% respectively as illustrated in Table 4.3.

Table 2:
Association between socio-demographic characteristics and STI diagnosis

Predictors	Diagnosis of STI in the last 3 months		χ2	Degree of freedom (df)	P value (p<0.05)	95% C.I	
	No	Yes				Lower	Upper
Age							
18-20	11(55.0)	9(45.0)	17.12	1	0.187	0.001	3.553
21-29	60(75.0)	20(25.0)		1	0.035*	0	0.746
30-39	8(30.8)	18(69.2)		1	0.835	0.065	29.675
40-49	1(50.0)	1(50.0)		1	0.761	0.051	16.932
Marital status							
Divorced	1(50.0)	1(50.0)	2.36	1	0.283	0	.
Married	8(53.3)	7(46.7)		1	0.190	0.05	0.611
Single	72(64.3)	40(35.7)		1	0.021*	0.04	0.405
Highest level of education							
Primary	6(54.5)	5(45.5)	0.33	1	0.501	0.35	8.547
Secondary	29(63.0)	17(37.0)		1	0.733	0.293	2.37
Tertiary	45(63.4)	26(36.6)		1	0.406	0.471	3.791
Occupation							
Government/private employed	17(70.8)	7(29.2)	4.47	1	0.206	0.062	1.821
Not Employed	6(42.9)	8(57.1)		1	1.000	0	.
Self-employed	41(60.3)	27(39.7)		1	0.081	0.84	21
Student	15(71.4)	6(28.6)		1	0.394	0.441	8

Association of sexual behavioural patterns and STI prevalence

The findings indicated that missing PrEP in the last 3 months was not significantly associated with STI prevalence (46.3%) [p=0.093]. Engaging in all types of sexual typologies (anal, oral and bisexual sex), was significantly associated with STI prevalence (27.8%) [p=0.022], similar to anal and bisexual (p=0.008) and anal and oral (p=0.011). There was no significant association between participants who at times used condoms with paying clients and STI prevalence (34.3%) [P=0.718]. Engaging in anal sex and never using condoms was significantly associated with STI prevalence (42.9%) [p=0.018].

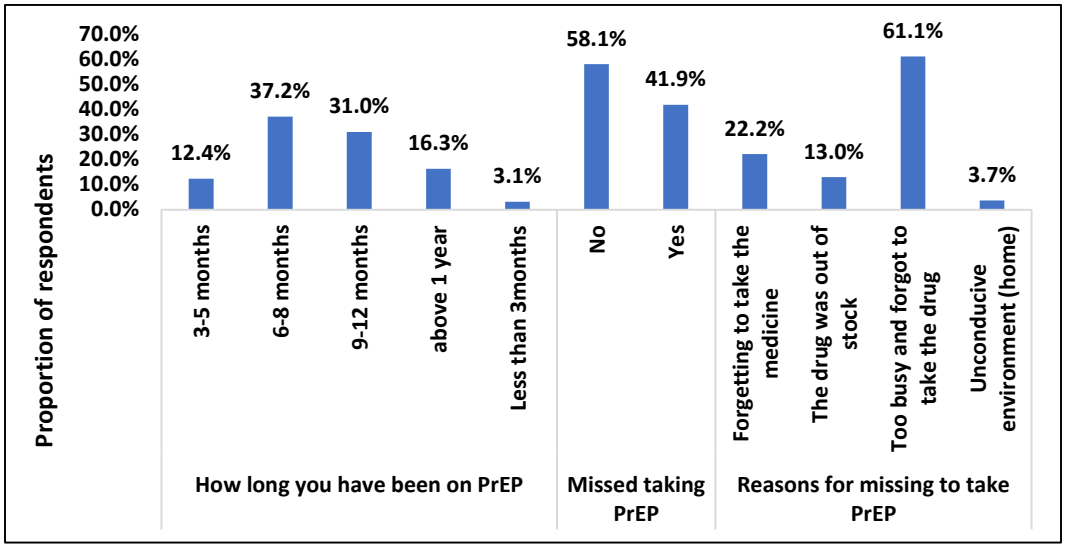

Figure 2:
PrEP uptake

Table 3:
Frequency of using condoms during sexual encounters (n; %)

Variable	Category	Paying clients	Regular clients	Anal sex	Oral sex	Bisexual sex
Frequency of using condoms	Always	34(26.6)	18(14.0)	17(13.2)	10(9.8)	4(10.8)
	Most of the time	35(27.3)	24(18.6)	33(25.6)	19(18.6)	1(2.7)
	Never	22(17.2)	54(41.9)	28(21.7)	23(22.6)	23(62.2)
	Sometimes	31(24.2)	33(25.6)	51(39.5)	50(49.0)	9(24.3)
	Total	129(100)	129(100)	129(100)	102(100)	37(100)

Variable	Category	Freq.
Average number of sex acts per week	11-20	1(0.8)
	6-10	21(16.3)
	Five and below	107(83.0)
	Total	129(100.0)
Number of sexual partners	1	16(12.6)
	2-4	101(79.5)
	5 and above	10(7.9)
	Total	127(100.0)

Having multiple partners; 5 and above had a significant association with STI prevalence (30.0%) [p=0.040]. Two different lines of thought were experienced from the qualitative analysis of FGDs and KIIs:

Agreed: *'If you miss taking PrEP continuously while on medication and depending on the type of sex you engage like anal, oral, bisexual, that will highly contribute to one contracting STIs'*. FGD

'Lack of frequent use of condoms especially with paying clients, increases the chances of contracting STIs.' KII

Table 4:
Association between Sexual Behavioural Patterns and STI Prevalence

Predictors	STI diagnosis during the last 3 months		χ2	Degree of freedom (df)	P value (p<0.05)	95% C.I	
	No	Yes				Lower	Upper
How long have you been on PrEP							
3-5 months	9(56.3)	7(43.8)	4.29	1	0.721	0.017	17
6-8 months	29(60.4)	19(39.6)		1	0.937	0.04	32.76
9-12 months	22(56.4)	17(43.6)		1	0.711	0.072	47.21
Above 1 year	17(81.0)	4(19.0)		1	0.496	0.011	8.766
Missed taking PrEP in the last 3 months							
No	51(68.9)	23(31.1)	3.08	1	0.093	0.13	1.169
Yes	29(53.7)	25(46.3)		1	0.302		
Type of sex you engage in							
Anal & Bisexual sex	10(62.5)	6(37.5)	3.21	3	0.008*		
Anal & oral sex	41(66.1)	21(33.9)		1	0.011*	0.583	9.233
Anal sex	16(50.0)	16(50.0)		1	0.794	0.015	4.412
Anal, oral & bisexual	13(72.2)	5(27.8)		1	0.022*	0.144	25.33
Frequency of using condoms with paying clients							
Always	23(67.6)	11(32.4)	4.95	1	1.000	0	
Most of the time	23(65.7)	12(34.3)		1	0.718	0.068	6.359
Never	9(40.9)	13(59.1)		1	0.040*	0.014	1.089
Sometimes	19(61.3)	12(38.7)		1	0.999	0	
Frequency of using condoms with regular clients							
Always	10(55.6)	8(44.4)	5.49	3	0.023*		
Most of the time	10(43.5)	13(56.5)		1	0.737	0.032	11.41
Never	37(68.5)	17(31.5)		1	0.008*	2.325	26.11
Sometimes	23(69.7)	10(30.3)		1	0.521	0.03	5.924
Use of condoms for anal sex							
Always	10(58.8)	7(41.2)	0.73	3	0.985		
Most of the time	22(67.7)	11(33.3)		1	0.888	0.025	24.75
Never	16(57.1)	12(42.9)		1	0.018*	0.133	18.69
Sometimes	32(64.0)	18(36.0)		1	0.998	0	
Use of condoms for bisexual sex							
Never	14(63.6)	8(36.4)	0.93	1	1.000	0	
Sometimes	6(66.7)	3(33.3)		1	0.177	0.343	38.22
Average number of sex acts per week							
6-10	15(71.4)	6(28.6)	2.44	1	1.000	0	
Five and below	65(61.3)	41(38.7)		1	0.373	0.067	2.754
Number of sex partners							
1	8(50.0)	8(50.0)	1.54	1	0.999	0	
2-4	65(65.0)	35(35.0)		1	0.022*	0.318	14.65
5 and above	7(70.0)	3(30.0)		1	0.040*	0.254	31.36

On the contrary: *'If you have regular clients and use condoms, chances of contracting STIs is low. On the contrary was that the higher the number of partners, the higher the risk of contracting STIs'*. KII

Clinical characteristics

The study found that in the last 4 weeks, 28.4% had STI-related clinical symptoms such as itchy genitals or anus, sores around genitals or anus, unusual discharge, and pain when peeing, while the other 71.7% did not. Only a small proportion (10.4%) notified their partners when they turned positive for STI(s) which implied that the cross-transmission of STIs is still high as they continue having sexual encounters and a majority (89.6%) did not disclose their serostatus, main reasons being fear (44%), intimate partner violence (8%), and lack of care for a partner.

Association of clinical characteristics and STI prevalence

A significant association was found between one having clinical symptoms for STIs in the last four weeks with STI prevalence (80.6%) [p=0.000]. The findings agreed with those from FGDs that;

'*There is a high likelihood that if in the last four weeks, you had clinical symptoms like itchiness, discharge and sores for STI, you will test positive for an STI'*. FGD

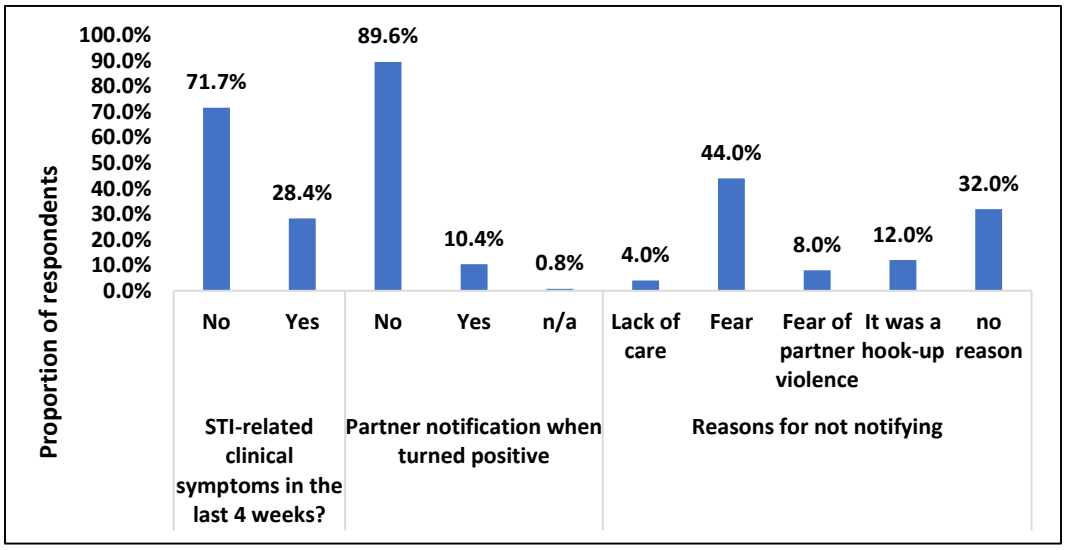

Figure 3:
Notification of partners on testing STI-positive

Table 5:
Association between clinical characteristics and STI prevalence

Predictors	Diagnosis of STI in the last 3 months		χ2	Degree of freedom (df)	P value (p<0.05)	95% C.I	
	No	Yes				Lower	Upper
Presented STI-related clinical symptoms in the last 4 weeks							
No	73(81.1)	17(18.9)	2.19				
Yes	7(19.4)	29(80.6)		1	0.000*	0.491	0.973
Partner (s) notification on seroconverted for STI?							
No	75(67.0)	37(33.0)	7.68	1	.0130*	0.862	1.393
Yes	4(30.8)	9(69.2)					

Equally, lack of partner notification upon seroconversion was significantly associated with STI prevalence (69.2%) [p=0.013]. These findings are in line with those from KII:

'*If a partner does not disclose the positive STI results to their partner(s), this, therefore, increases the chances of STI infection"*. KII

Table 6:
Multivariate Regression Analysis

	Predictors	Unadjusted Odds Ratio (95% C.I)	P value (p<0.05)	Adjusted Odds Ratio (95% C.I)	P value (p<0.05)
Age	18-20	0.073(0.01-3.55)	0.187	0.081(0.03-7.26)	0.173
	21-29	0.17(0.00-0.75)	0.035	3.92(0.14-9.67)	0.041
	30-39	1.386(0.07-29.68)	0.835	1.435(0.08-6.17)	0.74
	40-49	1.049(0.05-16.93)	0.742	0.941(0.07-3.04)	0.742
Marital status	Divorced	4.73(0.00-0.13)	1	4.51(0.00-0.09)	1
	Married	0.05(0.05-0.61)	0.019	0.19(0.08-0.75)	0.02
	Single	1.714(0.04-0.41)	0.021	1.84(0.07-0.52)	0.035
Highest level of education	Primary	1.73(0.35-8.55)	0.501	1.60(0.31-7.04)	0.435
	Secondary	0.834(0.29-2.37)	0.733	0.866(0.32-2.59)	0.614
	Tertiary	0.531(0.47-3.79)	0.406	0.672(0.38-4.01)	0.498
Occupation	Government/private employed	0.336(0.06-1.82)	0.206	0.491(0.17-2.03)	0.198
	Not Employed	0(0.00-0.13)	1	0(0.00-0.03)	1
	Self-employed	4.2(0.84-21)	0.081	5.73(1.69-31.20)	0.23
	Student	1.878(0.44-8.00)	0.394	2.19(0.74-8.13)	0.301
How long have you been on PrEP	3-5 months	0.531(0.017-17.00)	.721	0.531(0.024-13.81)	.630
	6-8 months	1.143(0.04-32.76)	.937	1.252(0.05-31.03)	.745
	9-12 months	1.846(0.07-47.21)	.711	1.90(0.09-38.04)	.655
	Above 1 year	0.315(0.011-8.76)	.496	0.201(0.034-7.49)	.642
Missed taking PrEP in the last 3 months	No	1.39(0.13-1.17)	.093	1.71(0.51-1.91)	.091
Type of sex you engage in	Anal & oral sex	11.047(0.58-9.23)	.011	13.59(1.43-6.58)	.020
	Anal sex	1.908(0.015-4.41)	.794	2.353(0.194-5.07)	.685
	Anal, oral & bisexual	25.57(0.14-25.33)	.022	18.32(0.92-22.17)	.013
Frequency of using condoms with regular clients	Most of the time	0.604(0.74-0.032)	.737	0.965(0.701-0.349)	.697
	Never	24.87(2.33-26.11)	.008	18.06(3.52-19.61)	.017
	Sometimes	0.42(0.03-5.92)	.521	1.013(0.41-7.48)	.212
Use of condoms for anal sex	Most of the time	0.78(0.025-24.75)	.888	1.09(0.121-19.04)	.680
	Never	1.58(01.3-18.69)	.018	1.58(0.67-33.72)	.025
	Sometimes	3.136(0.000-0.013)	.998	3.403(0.000-0.019)	.991
Number of sex partners	1	0.623(0.00-0.01)	.999	0.621(0.00-0.01)	.998
	2-4	6.76(0.32-14.65)	.022	5.61(1.01-10.52)	.023
	5 and above	2.82(0.25-31.36)	.040	3.41(0.19-28.45)	.039
Partner notification on seroconversion for STI	No	0.45(0.86-1.39)	.013	0.45(0.92-8.41)	.013

Multivariate regression analysis

The unadjusted multivariable analysis for demographic factors indicated that the age 21-29 years (p=0.035), being married (p=0.019), and single (p=0.021) were risk factors associated with STI prevalence. When the model was adjusted, for the same factors, the age 21-29 years (p=0.041), being married (p=0.02), and being single (p=0.035) remained significantly associated with STI prevalence.

The unadjusted sexual behavioural patterns, engaging in all sexual typologies (anal, oral and bisexual sex), [p=0.022], engaging in anal sex and never using condoms [p=0.018] and having multiple partners (<5) [p=0.040] had a significant association with STI prevalence. Upon adjusting the model, engaging in all sexual typologies (anal, oral and bisexual sex), [p=0.013], engaging in anal sex and never using condoms [p=0.025] and having multiple partners (<5) [p=0.039] remained significantly associated with STI prevalence.

The unadjusted clinical characteristics: presenting clinical symptoms for STIs in the last four weeks [p=0.000] and notifying partners upon seroconversion [p=0.013], were risk factors significantly associated with STI prevalence. Upon adjustment, clinical symptoms for STIs in the last four weeks [p=0.000] and notifying partners upon seroconversion [p=0.013], remained to be significantly associated with STI prevalence.

Discussion

The STI prevalence among MSM was 37.5%. These findings agree with a study conducted in California, where 50% of the cohort was diagnosed with an STI in 12 months after starting PrEP (14). This also agrees with data from NASCOP (10) indicating that 35% of the MSM currently on PrEP have at one point acquired an STI, a 21% increase in the prevalence of STIs recorded normally. The most prevalent STIs were contracting both Chlamydia and Gonorrhoea (47.9%), and genital warts (31.3%) agreeing with a study in the Coast region by Sanders (15) among MSM, indicating a high (40%) STI burden (N. *gonorrhoea* and C. *trachomatis*). The prevalence of STIs among MSM on PrEP is still high. The high prevalence has broad implications for public health by increasing the risk of STI transmissions, impacting individual well-being due to poor health outcomes, stigma and discrimination and mental health impacts on anxiety and depression. The treatment of STIs is expensive and this can have an economic strain on healthcare resources, hence increasing the public health cost, therefore, requires regular testing and prevention against STIs. Future study on the cost-effectiveness of public health interventions among MSM programming on STIs.

The sexual patterns of frequency in using condoms with paying clients were common but had no significant association with STIs (p=0.718), but significant association (0.017) to STIs experienced when never or rarely using condoms with regular clients. The findings agree with several studies indicating that different kinds of sexual partners classified as regular, new, or casual do have high STI prevalence rates (16,17,18). This resonates with a study in Nigeria which indicated a significant association between unprotected sex with paying clients and contracting STIs (19). The regression analysis results indicated significant associations between STI prevalence and the sexual typologies (combined anal, oral and bisexual sex), (p=0.022), similar to anal and bisexual (p=0.008) and anal and oral (p=0.011). This concurs with a study conducted in high-income countries, indicating that oral and anal sex, are major drivers for STI transmission by 31% among the MSM due to little or lack of condom use and having multiple sexual partners (20). Another study in Nairobi concurs that engaging in anal sex is 4.1 times more likely to contract STIs (4). Similarly, in Maryland, individuals who practised anal sex had a high prevalence of STIs (6). This implies

that significant STI relationships are noted for various forms of sexual typologies. In this regard, multiple sexual partners, and inconsistent condom use, make individuals vectors of STIs, leading to higher rates of exposure and transmission. Multiple partners impede timely treatment and prevention efforts. These behaviours not only increase the risk of the common STIs but also elevates the likelihood of HIV transmission, especially through anal intercourse which is a high risk. This calls for active partner notification and advocates for current and consistent condom use.

The respondents frequently screened for STIs on average 3-6 months. This corresponds with the MSM screening guidelines (5). The majority of the participants (89.6%) did not notify their partners when they turned positive for STI, and this was significant (p=0.013) to STI prevalence. The reasons for the lack of notification included fear, and intimate partner violence, and some did not care. The implication is increased cross-transmission of STIs due to non-disclosure. The results were in line with findings from Swann stating that STIs are prevalent when one fails to notify their partners upon seroconversion, has multiple sexual partners and continues to engage in unprotected sex (14). Frequent screening of STIs and informing partners is critical to preventing STI transmission. Non-disclosure increases transmission risk, delays diagnosis and treatment, fostering resistant strains and complicating long-term treatment. It hampers contact tracing, with legal consequences for knowingly transmitting STIs. This advocates for testing with your partner and seeking early treatment when STI is positive. An opportunity for future study on identifying novel approaches to partner notification among MSM who seroconvert for STIs.

Study limitations included behavioral data on sexual patterns being self-reported and this is usually subject to recall bias such as MSM not able to remember how many partners they have had in the past. Social desirability bias as MSM tends to report the good, especially on the number of sexual acts instead of the true picture. This was minimized by piloting the study tools, to ensure relevance and reliability.

Conclusion

In summary, this study is a critical contribution to public health practice and policy as policymakers can use the study results to inform or update existing policies related to sexual health, PrEP implementation, and the broader health needs of MSM. The findings have the potential to inform evidence-based decision-making, refining and improving preventive measures and tailoring interventions to the unique needs of this population. The findings have an impact on the potential modification of PrEP guidelines and other aspects of PrEP implementation. The study's insights contribute to the refinement of public health surveillance systems for MSM on PrEP.

Recommendations

The actionable steps for the Ministry of Health and partners include Step 1: Bringing together all health actors in HIV key population programming to address the STI prevalence and predictors established. Step 2: Modify PrEP guidelines and other aspects of PrEP implementation. Step 3: Develop a comprehensive sexual health education program. Step 4: Promote regular testing for STIs and encourage continuous, consistent, and correct condom use. Step 5: Encourage partner notification for seroconversions and ensure timely treatment. Step 6: Encourage innovations like partner notification services to break the circuit of STI infection among MSM on PrEP with multiple partners. The latter creates opportunities for a future study on identifying novel approaches to partner notification among MSM who seroconvert for STIs.

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