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Risk Factors Associated with Syphilis Infection among Men Who Have Sex with Men in Nairobi City County, Kenya

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Abstract: ***Syphilis is an infectious disease caused by the bacterium* Treponema palladium*. Globally, about 12 million people, majority of who come from sub-Saharan Africa and Asia have suffered from syphilis infections. This study therefore sought to determine the prevalence and the risk factors for occurrence of syphilis among men who sex with men in SWOP/MSM clinic in Nairobi City County. The study adopted analytical cross sectional-descriptive study design which encompassed use of qualitative and quantitate data collection techniques. Structured questionnaires were used to collect quantitative data from respondents while Key Informant Interview schedules were used to qualitative data form healthcare workers in SWOP/MSM clinics. The study targeted a sample size of 257 MSMs attending clinical appointments in the facility. Systematic random sampling was used to select respondents using a predetermined interval of 2. The researcher obtained ethical clearance from the Kenyatta University Ethical Review Committee. Before interview each selected respondents, the study sought informed consent from respondents. Blood samples of 3mls were collected from respondents after each interview for VDRL screening. Positive VDRL specimens were subjected to a specific treponema test (Fluorescent treponema antibody absorption FTA-ABS) test for confirmatory diagnosis and treatment was given immediately by the clinical officer in the clinic. Data was then cleaned and entered into a Microsoft excel database for processing. This was later exported to SPSS version 22.0 for analysis. Descriptive data were presented using frequency tables, graphs and pie-charts. Inferential statistics were done using Chi-square to establish the relationship between variables. Qualitative data from KII was triangulated with quantitative data as direct quotes or narrations from respondents. The study found out that the prevalence of syphilis among MSMs in Nairobi stood at 18.9%. From Chi-Square analysis, the study revealed significant relationship between knowledge factors, risk factors and attitude towards syphilis infection. Transmission mode (p=0.001), frequency of syphilis testing (p=0.001), knowledge on syphilis reinfection (p=0.011), sexual orientation (p=0.005), number of sexual partners (p=0.001), isolation among MSMs (p=0.034), inconsistent use of condoms (p=0.001) and being afraid of syphilis infection (p=0.001) played a significant role in syphilis infection among respondents. These results will be presented to NASCOP and other NGOS and recommendations advised accordingly. These research findings would assist Key healthcare stakeholders to design strategic policies and initiatives to address the challenges faced by MSMs in acquiring healthcare services. This would in turn reduce the rising prevalence of syphilis infections among MSMs in Kenya.***

Keywords: Knowledge, Prevalence, Syphillis

1. Introduction

Syphilis infection is caused by the bacterium Treponema palladium. Globally, about 12 million people, majority of who come from sub-Saharan Africa and Asia have suffered from syphilis infections. It is estimated that 2.1 million people remain undiagnosed in sub-Saharan Africa (1). The World Health organization (WHO) estimates that 2.1 million people remain undiagnosed in sub-Saharan Africa. Syphilis remains a significant cause of preventable death in developing countries with many people remaining untested and thus untreated (2).

Recently, cases of syphilis re-emergence have been reported worldwide. It is estimated that the prevalence of syphilis is alarmingly high (3). Despite improved public health conditions due to increased economic development, there has been witnessed higher spread of syphilis and other STDs as a result of internal migrations, commercial sex industries and economic disparities (4). Syphilis has been reported to be among the most prevalent communicable infections in most Asian countries even though it was nearly eradicated in 1970s (5).

The prevalence of syphilis in Kenya is1.8% while in Nairobi is 2.2% (6). The prevalence of syphilis among MSMs is estimated at 12% (7). MSMs account for high syphilis prevalence in Kenya due to high risk factors associated with unsafe sexual practices (8). Male sex workers are at higher risk of these infections compared to female sex workers (4).

Vertical transmission and unprotected sexual contact are the most common routes of transmission (9). Syphilis causes three stages of symptomatic disease: primary, secondary and tertiary syphilis (10). Patients infected with syphilis are more vulnerable to HIV infections especially through ulcers occurring around the genital areas (11). HIV-syphilis co-infections exposes individuals to high risks of getting tertiary syphilis. This can lead to neuro-syphilis, a health condition associated with psychosis and other motor-related problems (9).

Screening for syphilis among MSMs remains a very important priority for preventing adverse outcomes (12). Serological diagnosis can be carried out by venereal disease research laboratory (VDRL) and the rapid plasma reagin (RPR) tests (12). Syphilis can be cured through use of penicillin, even though all damages are not reversible, more particularly tertiary and congenital syphilis. Since syphilis prevalence facilitates HIV infections, it is significant to

understand and track the precursors to increased prevalence of syphilis cases as a control strategy towards reducing HIV and syphilis infections.

2. Materials and Methods

The study was conducted at the Swop/MSMs clinic in Nairobi City County; using analytical cross-sectional descriptive study design with the MSMs who attended the Swop/MSM clinic being the study population. Data was collected using structured questionnaires and key informant interviews. Quantitative data from questionnaires and laboratory results were cleaned, coded, double entered, double checked and stored into Microsoft Excel program for analysis. Data was then exported to SPSS version 22.0 for analysis. Descriptive statistics were presented as charts, graphs, percentages and frequency distribution tables. Inferential statistics were used to test the relationship between the study variables. This was achieved through Chi-square tests done at 95% confidence interval and p-values less than 0.05 were considered significant. Ethical clearance to carry out this research was sought from Kenyatta University Ethical Review Committee (KUERC). The researcher also got a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). The researcher further sought permission from County Commissioner, County Education Officer and the Director of Health Services from Nairobi City County. An informed consent to participate in the study was sought from each respondent. Study respondents were assured of privacy and confidentiality of the information given. They were treated with the respect they deserved and participation in the study was voluntary without due coercion. These findings shall be disseminated for action and future reference for other researchers through publication.

3. Results

3.1 Socio-demographic factors of respondents

The study targeted 257 men who had sex with other men attending the Swop/MSM clinic in Nairobi City County. Out of this, 249 questionnaires were completely filled and considered for analysis representing a response rate of 96.7%. The study found out that less than a half 102 (41.0%) of the respondents were aged 30-39 years followed by 69 (27.7%) aged 20-29 years. More middle-aged respondents engaged in MSM acts shows they are sexually active and may be experiencing peer influence.

The study found out that more than a half 143 (57.4%) of respondents had attained secondary level of education followed by 54 (21.7%) with tertiary education. Those with primary education were 39 (15.7%) while the rest 13 (5.2%) had no formal education. The higher number of men with secondary and tertiary education engaging in homosexual reflects possession of information regarding MSM activities. Regarding religion, majority 173 (69.5%) of the respondents interviewed were Christians with 62 (24.9%) being Muslims. This may be attributed to the fact that most of the inhabitants of Nairobi City County are Christians.

The study revealed that the marital status of slightly less than a half 123 (49.4%) of the respondents were single followed by 77 (30.9%) who were married. This may be attributed to them having sexual relationships with their fellow men hence considering themselves single since homosexuality is not legalised in Kenya. Concerning the occupational status, less than a half 112 (45.0%) of the respondents were self-employed followed by 88 (35.3%) who were employed. Due to high rates of unemployment, many young people are engaging in self-employment activities to earn a living.

Table 3.1: Socio-demographic characteristics of respondents (n=249)

Variable	Respondent response	Frequency (N)	Percentage (%)
Age	≤19	13	5.2
	20-29	69	27.7
	30-39	102	41.0
	40-49	46	18.5
	≥50	19	7.6
Level of Education	No formal education	13	5.2
	Primary education	39	15.7
	Secondary education	143	57.4
	Tertiary education	54	21.7
Religion	Christian	173	69.5
	Muslim	62	24.9
	Others	14	5.6
Marital Status	Married	77	30.9
	Single	123	49.4
	Divorced	35	14.1
	Widowed	14	5.6
Occupation	Not Employed	49	19.7
	Employed	88	35.3
	Self-employed	112	45.0

3.2 Prevalence of syphilis among respondents

The study found out that prevalence of syphilis among the interviewed respondents was 18.9%. This was after 47 respondents had their VDRL results turning positive while 202 (81.1%) were negative. The results were as shown in figure 3.1 below.

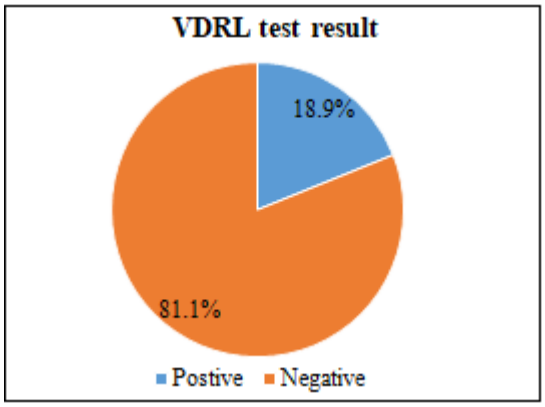

Figure 3.l: Prevalence of syphilis among respondents

The respondents also reported that previously 72 (28.9%), 49 (19.7), 24 (9.6%) and 16 (6.4%) had tested positive for HIV, syphilis, Gonorrhoea and chlamydia respectively. However, 88 (35.3%) of the respondents had not tested positive for the stated STIs. This showed that, in many cases, one can be HIV positive without testing positive for

syphilis infection. The results were presented in table 3.2 below.

Table 3.2: Previous self-reported STI infections among respondents

Variable	Respondent response	Frequency (N)	Percent (%)
Previous STI infection	Syphilis	49	19.7
	HIV	72	28.9
	Gonorrhoea	24	9.6
	Chlamydia	16	6.4
	No STI	88	35.3
	Total	249	100.0

3.3 Respondents' knowledge on syphilis

3.3.1 Awareness of syphilis

Majority 213 (85.5%) of the respondents were aware of syphilis infection while the rest 36 (14.5%) were not aware. The results were as presented in figure 3.2 below.

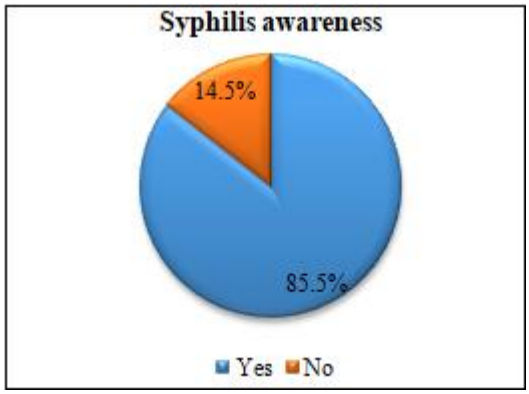

Figure 3.2: Syphilis awareness among respondents

3.3.2 Mode of transmission

Among those respondents who were aware about syphilis infection, slightly less than a half 97 (46.4%) of respondents reported that unprotected anal sex was the leading mode of syphilis transmission among MSMs. This was closely followed 71 (34.0%) who reported that oral sex is also another mode of syphilis transmission.

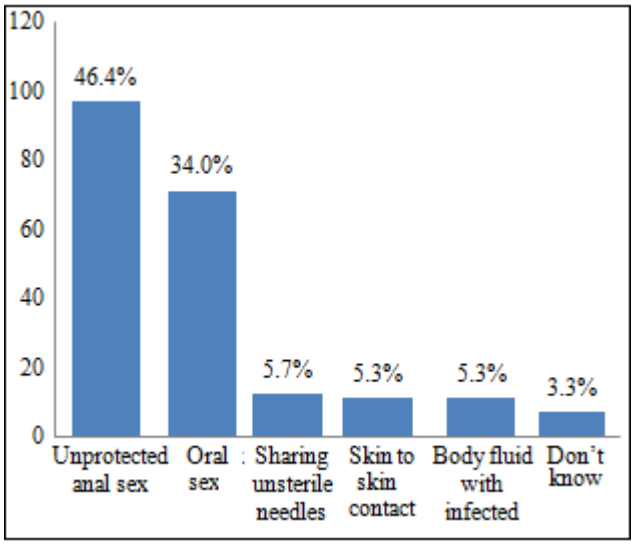

Figure 3.3: Respondents knowledge on syphilis mode of transmission

3.3.3 Frequency of syphilis testing among MSMs

On whether respondents were aware of the frequency of syphilis testing, majority 154 (61.8%) of them were of the view that a man having sex with another man should be tested for syphilis at least once per month. However, 58 (23.3%) thought that one should get tested for syphilis once in three months.

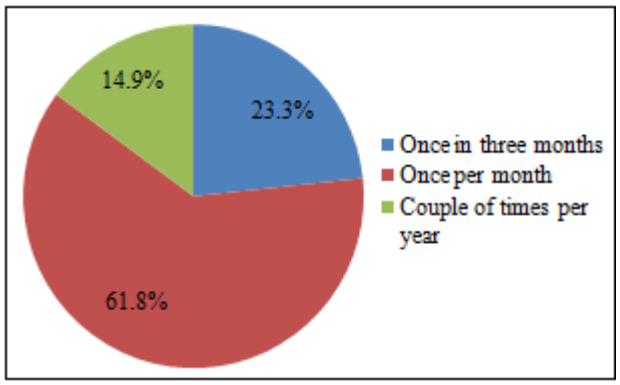

Figure 3.4: Syphilis testing frequency among respondents

3.3.4 Healthy looking person having syphilis

On whether respondents were knowledgeable on a healthy looking person having syphilis infection, slightly more than a half 131 (52.6%) of them were of a contrary opinion.

Table 3.3: Healthy looking person having syphilis

Variable	Respondent response	Frequency (N)	Percent (%)
Healthy looking person having syphilis	True	97	39.0
	False	131	52.6
	Cannot tell	21	8.4
	Total	249	100.0

3.3.5 Oral sex, medication and syphilis reinfection

The study revealed that about a half 126 (50.6%) of respondents reported that oral sex is less likely to lead to syphilis infection as compared to anal sex. Most 190 (76.3%) of the respondents revealed that syphilis can be cured through medication. Despite this, they further reported that one can get reinfected as indicated by slightly less than a half 121 (48.6%) of respondents. The results were as shown in table 3.4 below.

Table 3.4: Knowledge on oral sex, syphilis medication and reinfection among respondents (n=249)

Variable	Respondent response	Frequency (N)	Percentage (%)
Oral sex less likely to lead to syphilis infection than anal sex	Yes	126	50.6
	No	96	38.6
	Cannot tell	27	10.8
Syphilis can be cured through medication	True	190	76.3
	False	43	17.3
	Don't know	16	6.4
One can get reinfected even after getting treated for syphilis	True	121	48.6
	False	90	36.1
	Don't know	38	15.3

3.3.6 Knowledge of syphilis prevention among respondents

The study found out that less than a half 95 (38.2%) of respondents reported that abstinence from sexual intercourse could help prevent one from getting infected with syphilis.

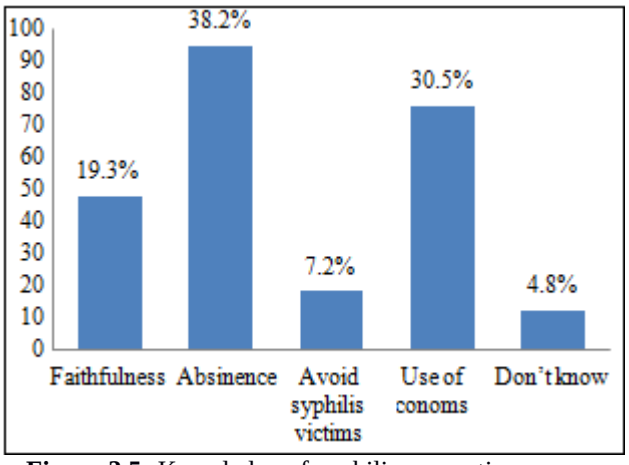

Figure 3.5: Knowledge of syphilis prevention among respondents

3.3.7 Importance of knowing syphilis status

The study found out that most 221 (88.8%) of respondents reported that it was significant to know ones status. This would enable them to seek early comprehensive care if infected. The results were as shown in figure 3.6 below.

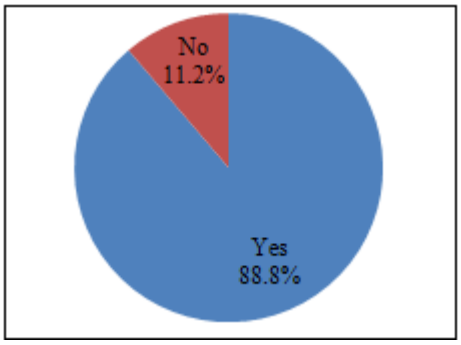

Figure 3.6: Importance of knowing syphilis status among respondents

3.3.8 Association of knowledge factors and prevalence of syphilis among respondents

The study results showed that majority 40 (85.1%) of the respondents who tested positive for syphilis were aware of syphilis infection. This may be attributed to the fact that they might have been tested previously for the disease. There was no significant statistical association (p=1.000) between awareness of syphilis and testing positive for the infection. A half 20 (50.0%) of those who were aware of syphilis infection reported that the most common mode of its infection was having unprotected anal sex. There was a significant statistical association between mode of transmission and syphilis status. These results were consistent with qualitative data in which one of the nurses said,

"*…Our clients are mostly MSMs and engage in unprotected anal sex with their counterparts…they are even aware that this predisposes them to STIs."*

Regarding respondents' knowledge on syphilis testing frequency, slightly less than a half 22 (46.8%) of the participants reported that men having sex with other men should be tested once in a month. The results showed a significant statistical association (p=0.001) between knowledge on syphilis testing frequency and syphilis status. Qualitative results from one of the service providers confirmed this by saying.

Majority 33 (70.2%) of respondents whose VDRL test indicated positive said that there were no chances of a healthy looking individual having syphilis infection. This means that they were not aware of the asymptomatic stage of syphilis infection which does not show clinical symptoms. However, at this stage individuals are highly infectious. There was a significant statistical association (p=0.002) between a healthy looking person and testing positive for syphilis infection.

The study results showed that majority 112 (55.4%) of respondents who tested negative for syphilis infection thought that it is likely to get infected while engaging in oral sex. However, it was revealed that engaging in oral sex was less likely to cause syphilis infection than anal sex with a statistical significant of pvalue of 0.001. Majority 157 (77.7%) of respondents believed that syphilis can be cured through medication. They might have been infected previous and got cured after seeking respective treatment options. However, the study did not show any statistical association (p=0.692) between knowledge on syphilis medication and status among respondents.

The study results showed that slightly more than a half 25 (53.2%) of the respondents who tested positive for syphilis were not knowledgeable about syphilis reinfection after cure. There was a significant statistical association (p=0.011) between knowledge on syphilis reinfection and syphilis status among respondents. Regarding knowledge on syphilis prevention, less than a half 79 (39.1%) of respondents who tested negative said that abstinence can help prevent infection. There was a significant statistical association (p=0.001) between prevention knowledge and syphilis status. Majority 189 (93.6%) of respondents who tested negative reported that it was important to know their syphilis status. There was a significant statistical association (p=0.001) between importance of knowing syphilis status and VDRL test results. The results were as presented in table 3.5below.

Table 3.5: Relationship between knowledge factors and syphilis infection among respondents (n=249)

Independent variable	*Respondent response*	*Dependent variable Syphilis infection (VDRL test)*		*Statistical significance*
		Positive (N=47)	Negative (N=202)	
Awareness syphilis	Yes	40 (85.1%)	173 (85.6%)	χ^2=0.009, df=1 p=1.000
	No	7 (14.9%)	29 (14.4%)	
Transmission mode	Unprotected anal sex	20 (50.0%)	77 (45.7%)	χ^2=61.172 df=5 p=0.001
	Oral sex	7 (17.5%)	64 (37.9%)	
	Sharing unsterile needles	3 (7.5%)	9 (5.3%)	
	Skin to skin contact	1 (2.5%)	10 (5.9%)	
	Body fluid contact with infected	4 (10.0%)	7 (4.1%)	
	Don't know	5 (12.5%)	2 (1.1%)	
Syphilis testing frequency	Several times per month	17 (36.2%)	41 (20.3%)	χ^2=20.677 df=2 p=0.001
	Once per month	22 (46.8%)	132 (65.3%)	
	Several times per year	8 (17.0%)	29 (14.4%)	
Healthy looking person having syphilis	True	8 (17.0%)	89 (44.1%)	χ^2=12.800 df=2 p=0.002
	False	33 (70.2%)	98 (48.5%)	
	Don't know	6 (12.8%)	15 (7.4%)	
Oral sex less likely to cause infection than anal sex	Yes	14 (29.8%)	112 (55.4%)	χ^2=48.832 df=2 p=0.001
	No	24 (51.1%)	72 (35.6%)	
	Cannot tell	9 (19.1%)	18 (8.9%)	
Syphilis can be cured through medication	True	33 (70.2%)	157 (77.7%)	χ^2=0.737 df=2 p=0.692
	False	8 (17.0%)	35 (17.3%)	
	Cannot tell	6 (12.8%)	10 (5.0%)	
A person can be re-infected after syphilis cure	True	9 (19.1%)	112 (55.4%)	χ^2=8.981 df=2 p=0.011
	False	25 (53.2%)	65 (32.2%)	
	Cannot tell	13 (27.7%)	25 (12.4%)	
Knowledge on syphilis prevention	Faithfulness	14 (29.8%)	34 (16.8%)	χ^2=29.612 df=4 p=0.001
	Abstinence	16 (40.4%)	79 (39.1%)	
	Avoid syphilis victims	2 (4.3%)	16 (7.9%)	
	Use of condoms	8 (17.0%)	68 (33.7%)	
	Don't know	7 (14.9%)	5 (2.5%)	
Important to know syphilis status	Yes	32 (68.1%)	189 (93.6%)	χ^2=24.801, df=1 p=0.001
	No	15 (31.9%)	13 (6.4%)	

3.4 Risk factors for syphilis infection

3.4.1 Sexual activities

Regarding sexual orientation, the study revealed that majority 156 (62.7%) of respondents interviewed were homosexuals. The study further showed that slightly more than half 129 (51.8%) of respondents had first sexual encounter with a man at the age of between 16-19 years. Majority 161 (64.7%) of respondents revealed that they spend their nights in lodges. Concerning the frequency of having oral sex among respondents, slightly more than a half 129 (51.8%) of respondents reported that they did not engage in oral sex in their past one month.

Majority 153 (61.4%) of respondents reported that over the last one month they had had one sexual partner. However, majority 137 (58.8%) reported that the gender of the sexual partner was a top. When asked about the type of sexual partner, 79 (33.9%) of the respondents revealed that the type of sexual partner they engaged in sex with was a steady (commercial) sexual partner.

Concerning condom use among respondents, slightly less than a half 121 (48.6%) reported that over the last months they sometimes used a condom when engaging in anal sex. Majority 131 (52.6%) of respondents revealed that over the last 6 months they never used lubricants during anal sexual intercourse.

Table 3.6: Sexual activities among respondents among respondents (n=249)

Independent Variable	Respondent response	Frequency (N)	Percentage (%)
Sexual orientation	Homosexual	156	62.7
	Bisexual	47	18.9
	Heterosexual	32	12.8
	Trans-gender	14	5.6
Age of first sexual encounter with a man	≤12 years	19	7.6
	13-15 years	79	31.7
	16-19 years	129	51.9
	≥20 years	22	8.8
Where you spend nights	Home	88	35.3
	Not at home	161	64.7
Frequency of oral sex in the last one month	None	129	51.8
	Once	72	28.9
	More than once	48	19.3
Frequency of anal sex in the last one month	None	24	9.6
	Once	56	22.5
	More than once	169	67.9
No of sexual partners in the last one month	None	16	6.5
	One	153	61.4
	More than one	80	32.1
Gender of sexual partner	Top	137	58.8
	Bottom	96	41.2
Type of sexual partner	Steady (non-commercial)	48	20.6
	Casual (non-commercial)	64	27.5
	Anonymous (non-commercial)	19	8.2

	Steady (commercial)	79	33.9
	Casual (commercial)	23	9.9
Had anal sex without a condom in the last 6 months	Never	39	15.7
	Sometimes	121	48.6
	Always	89	35.7
Use of lubricants in the last 6 months	Never	131	52.6
	Sometimes	96	38.6
	Always	22	8.8

3.4.2 Association of sexual activities and syphilis status

The study revealed that majority 29 (61.7%) of respondents who tested positive for syphilis were homosexuals. This study showed a statistically significant association (p=0.001) between sexual orientation and syphilis infection. It was further revealed that majority 108 (53.5%) who tested negative had their sexual debut with a man between ages of 16-19 years. However, the study did not show any statistical association (p=0.163) between age of sexual debut with a man and syphilis status.

Majority 40 (85.1%) of the respondents who tested positive for syphilis infection reported that they spent most of their nights away from home with a significant statistical association of p=0.001. Those who spent their nights away from home were 3.8 times more likely to get syphilis infection as compared to their counterparts (OR=3.831). The study further revealed that slightly less than a half 22 (46.8%) of the respondents reported having anal sex once in their previous one month. There was a significant statistical association (p=0.001) between frequency of anal sex among respondents and their syphilis status.

The study revealed that majority 30 (63.9%) of the respondents who tested positive for syphilis reported that they had had more than one sexual partner in their previous one month. There was a statistically significant association (p=0.001) between number of sexual partners and syphilis status. Regarding the type of sexual partner, 21 (44.7%) of those who had tested positive for syphilis reported that they had a steady (commercial) sexual partner in their last one month. There was a significant statistical association (p=0.001) between the type of sexual partner and syphilis status.

Slightly less than a half 23 (48.9%) of respondents who tested positive for syphilis reported that they had always had sex without using a condom for their previous 6 months. There was a significant statistical association (p=0.001) between having anal sex without a condom and syphilis status. Regarding using lubricants during anal sex in the last 6 months, slightly above average 110 (54.5%) of the respondents who tested negative for syphilis reported that they never used lubricants. However, there was no statistical significance (p=0.522) between use of lubricants during anal sex and syphilis status. The results were presented in table 3.7 below.

Table 3.7: Relationship between sexual activities and syphilis status among respondents (n=249)

Independent Variable	Respondent Response	Dependent variable		Statistical significance
		VDRL Postive (N=47)	VDRL Negative (N=202)	
Sexual orientation	Homosexual	29 (61.7%)	127 (62.9%)	χ^2=12.732 df=3 p=0.001
	Bisexual	15 (31.9%)	32 (15.8%)	
	Heterosexual	0 (0.0%)	32 (15.8%)	
	Trans-gender	3 (6.4%)	11 (5.3%)	
Age of first sexual encounter with a man	≤12 years	5 (10.6%)	14 (6.9%)	χ^2=5.118 df=3 p=0.163
	13-15 years	14 (29.8%)	65 (32.2%)	
	16-19 years	21 (44.7%)	108 (53.5%)	
	≥20 years	7 (14.9%)	15 (7.4%)	
Where you spend nights	Not home	40 (85.1%)	121 (59.9%)	χ^2=10.601, df=1 p=0.001, OR=3.831
	Home	7 (14.9%)	81 (40.1%)	
Frequency of oral sex in the last one month	None	23 (49.0%)	106 (52.5%)	χ^2=0.772 df=2 p=0.680
	Once	16 (34.0%)	56 (27.7%)	
	More than once	8 (17.0)	40 (19.8%)	
Frequency of anal sex in the last one month	None	7 (14.9%)	17 (8.4%)	χ^2=24.360 df=2 p=0.001
	Once	22 (46.8%)	34 (16.8%)	
	More than once	18 (38.3%)	151 (74.8%)	
No of sexual partners in the last one month	None	9 (19.1%)	7 (3.5%)	χ^2=51.326 df=2 p=0.001
	One	8 (17.0%)	145 (71.8%)	
	More than one	30 (63.9%)	50 (24.7%)	
Gender of sexual partner	Bottom	25 (53.2%)	(35.1%)	χ^2=11.331, df=1 p=0.001, OR=3.356
	Top	13 (27.7%)	124 (61.4%)71	
Type of sexual partner	Steady (non-commercial)	0 (0.0%)	48 (23.8%)	χ^2=82.712 df=4 p=0.001
	Casual (non-commercial)	2 (4.4%)	62 (30.7%)	
	Anonymous (non-commercial)	15 (31.9%)	4 (2.0%)	
	Steady (commercial)	21 (44.7%)	58 (28.7%)	
	Casual (commercial)	0 (0.0%0	23 (11.4%)	
Had anal sex without a condom in the last 6 months	Never	14 (29.8%)	25 (12.4%)	χ^2=19.098 df=2 p=0.001
	Sometimes	10 (21.3%)	111 (54.9%)	
	Always	23 (48.9%)	66 (32.7%)	
Use of lubricants in the last 6 months	Never	21 (44.7%)	110 (54.5%)	χ^2=2.706 df=2 p=0.522
	Sometimes	23 (48.9%)	73 (36.1%)	
	Always	3 (6.4%)	19 (9.4%)	

3.4.3 Use of drugs

The study revealed that slightly less than a half 121 (48.6%) of respondents interviewed sometimes use drugs before engaging in sexual intercourse. They cited alcoholic drinks and tobacco products that they sometimes use. The results were as presented in figure 4.7 below.

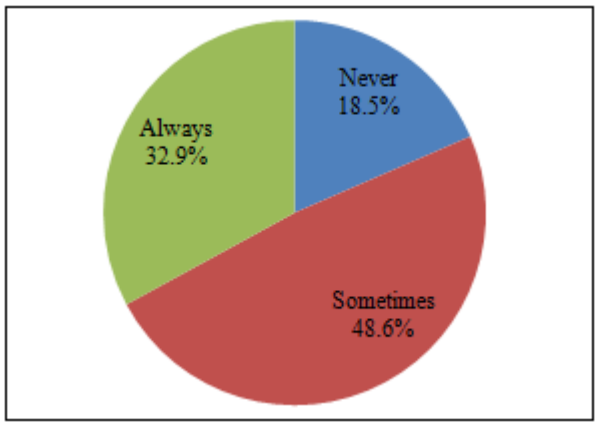

Figure 4.7: Frequency of drug use among respondents

3.4.4 Association between use of drugs and syphilis status

The study revealed that about a half 22 (50.5%) of respondents who tested negative for syphilis infection reported that they sometimes had used a drug before they engaged in sex with a man. However, there was no significant statistical association (p=0.304) between use of drugs during sexual intercourse and syphilis status. The results were presented in table 3.8 below.

Table 3.8: Relationship between use of drugs and syphilis status among respondents (n=249)

Independent Variable	Respondent Response	Dependent variable		Statistical significance
		VDRL Postive (N=47)	VDRL Negative (N=202)	
Frequency of drugs use	None	12 (25.5%)	34 (16.8%)	χ^2=2.38 df=2 p=0.304
	Sometimes	19 (40.4%)	102 (50.5%)	
	Always	16 (34.1%)	66 (32.7%)	

3.4.5 Psychological distress

Regarding psychological distress as a risk factor towards syphilis infection, majority 181 (72.7%) of respondents reported that over the last 12 months they felt isolated from the world in one way or the other. On whether the respondents ever contemplated attempting suicide, majority 223 (89.6%) of the participants did not attempt suicide. A large number 132 (53.0%) of respondents indicated that they had ever felt worried, anxious or fearful at one point in their life time as they engaged in MSM activities. More than a half 136 (54.6%) of respondents revealed that they felt hopeless or sad almost daily. The results were presented in table 3.9 below.

Table 3.9: Psychological distress among respondents (n=249)

Independent Variable	Respondent response	Frequency (N)	Percentage (%)
Ever felt isolated in the last 12 months	Yes	181	72.7
	No	68	27.3
Ever contemplated attempting suicide	Yes	26	10.4
	No	223	89.6
Ever felt worried, anxious or fearful	Yes	132	53.0
	No	117	470
Ever felt hopeless or sad almost daily	Yes	136	54.6
	No	113	45.4

3.4.6 Association between psychological distress and status of syphilis infection

Regarding influence of psychological distress on syphilis status, the study found out that majority 40 (85.1%) of respondents who tested positive reported that they had ever felt isolated from the world in the last 12 months. There was a significant statistical association (p=0.034) between feeling of isolation and syphilis status. Those who felt isolated were 2.5 times more likely to test positive for syphilis infection (OR=2.472).

Concerning contemplating suicide attempt amongst respondents, most 156 (77.2%) of the respondents who te3.4.6sted negative for syphilis infection reported that they had never contemplated attempting suicide. The study did not show any significant statistical association (p=0.825) between contemplating attempting suicide and syphilis status.

When the respondents were asked whether they had ever felt worried, anxious or fearful in the last 12 months, 109 (54.0%) of the respondents who tested negative fo syphilis reported that they had felt worried, anxious or fearful. The study did not show any significant statistical association (p=0.534) between feeling worried, anxious or fearful and syphilis status. Majority 112 (55.4%) of the respondents who tested negative for syphilis reported that they had felt hopeless or sad almost daily. However, there was no significant statistical association (p=0.587) between feeling hopeless or sad and syphilis status. The results were as presented in table 3.10 below.

Table 3.10: Relationship between psychological distress and syphilis status (n=249)

Independent Variable	Respondent Response	Dependent variable		Statistical significance
		VDRL Positive (N=47)	VDRL Negative (N=202)	
Ever felt isolated in the last 12 months	Yes	40 (85.1%)	141 (69.8%)	χ^2=4.499 df=1 p=0.034 OR=2.472
	No	7 (14.9%)	61 (30.2%)	
Ever contemplated attempting suicide	Yes	10 (21.3%)	46 (22.8%)	χ^2=0.049 df=1 p=0.825
	No	37 (78.7%)	156 (77.2%)	
Ever felt worried, anxious or fearful	Yes	23 (48.9%)	109 (54.0%)	χ^2=0.386 df=1 p=0.534
	No	24 (51.1%)	93 (46.0%)	
Ever felt hopeless or sad almost daily	Yes	24 (51.1%)	112 (55.4%)	χ^2=0.295 df=1 p=0.587
	No	23 (48.9%)	90 (44.6%)	

3.5 Attitude towards syphilis infection

The study showed that 95 (38.2%) of respondents were extremely afraid of contracting syphilis infection. They further revealed that 99 (39.8%) of respondents felt that they were not at a higher risk of contracting syphilis than other fellow men. However, more than a half 136 (54.6%) disagreed that there was nothing to be done to prevent them from being infected with syphilis. From qualitative results, one of the nurses working in an MSM/Swop clinic reiterated,

"…From my experience working in this clinic for a couple of years, it has been clearly indicated that the self-vulnerability level of MSMs is very low despite being afraid of contracting the STIs…."

Concerning transmission of STIs to their counterparts, the study revealed that 74 (29.7%) of respondents strongly agreed that they sometimes enjoy infecting other men with STIs. The study further showed that fairly 97 (39.1%) of respondents agreed that sex with a condom was not natural and pleasurable to them thus engaged in unprotected anal sex. However, majority 132 (53.1%) of the respondents strongly agreed that using a condom consistently and correctly reduces the risk of infection among sexual partners. The results were presented in table 3.11 below.

Table 3.11: Attitude towards syphilis infection (n=249)

Variable	Respondent response	Frequency (N)	Percentage (%)
Am afraid of getting syphilis infection	Extremely	95	38.2
	Very	72	28.9
	No	72	28.9
	Not bothered	10	4.0
Am at a higher risk of contracting syphilis infection	Strongly agree	30	12.0
	Agree	44	17.7
	Disagree	76	30.5
	Strongly disagree	99	39.8
Believe that there is nothing I could do to prevent being infected	Strongly agree	22	8.8
	Agree	19	7.7
	Disagree	136	54.6
	Strongly disagree	72	28.9
Enjoy transmitting STIs to other men	Strongly agree	74	29.7
	Agree	72	28.9
	Disagree	43	17.3
	Strongly disagree	60	24.1
Sex with condoms is not natural and pleasurable	Strongly agree	62	24.9
	Agree	97	39.1
	Disagree	35	14.1
	Strongly disagree	52	20.9
Using a condom consistently and correctly reduces risk of infection	Strongly agree	132	53.1
	Agree	77	30.9
	Disagree	21	8.4
	Strongly disagree	19	7.6

3.5.1 Association between attitude towards syphilis and syphilis status

The study found out that slightly more than a half 24 (51.1%) of the respondents who were positive for syphilis reported that they were very afraid of contracting syphilis. However, there was a significant statistical association between feeling afraid of contracting syphilis and syphilis status. The study further revealed that slightly below average 94 (46.6%) of respondents who tested negative strongly disagreed that they were at a higher risk of contracting syphilis infection. There was no significant statistical association (p=0.617) between believe of higher risk of contracting syphilis and syphilis status.

Regarding believe that there was nothing one could do to prevent himself from being infected, 118 (58.5%) of respondents who were negative disagreed. However, there was an association (p=0.001) between believe that there was nothing one could do to prevent himself from being infected and syphilis status. When the respondents were asked whether they would enjoy transmitting STIs to their respective sexual partners, 16 (34.0%) strongly agreed. There was a significant statistical association (p=0.029) between enjoying transmitting STIs to sexual partners and syphilis status.

Concerning sex with condom presumed not to be natural and pleasurable, 22 (46.8%) of respondents who were positive agreed. There was a significant statistical association (p=0.021) between sex with a condom being presumed to be unnatural and pleasurable and syphilis status. Majority 119 (58.9%) of respondents who tested negative for syphilis infection strongly agreed that use of condoms consistently and correctly reduces risk of infection. There was a significant statistical association (p=0.001) between using condoms consistently and correctly reduces risk of syphilis infection and syphilis status.

Table 3.12: Relationship between attitude and syphilis status (n=249)

Independent Variable	Respondent response	Dependent variable (VDRL Test)		Statistical significance
		Positive (N=47)	Negative (N=202)	
Am afraid of getting syphilis infection	Extremely	11 (23.4%)	84 (41.6%)	χ^2=53.577 df=3 p=0.001
	Very	24 (51.1%)	48 (23.8%)	
	No	7 (14.9%)	65 (32.2%)	
	Not bothered	5 (10.6%)	5 (2.4%)	
Am at a higher risk of contracting syphilis infection	Strongly agree	16 (34.1%)	14 (6.9%)	χ^2=37.655 df=3 p=0.617
	Agree	12 (25.5%)	32 (15.8%)	
	Disagree	14 (29.8%)	62 (30.7%)	
	Strongly disagree	5 (10.6%)	94 (46.6%)	
Believe that there is nothing I could do to prevent being infected	Strongly agree	6 (12.8%)	16 (7.9%)	χ^2=15.037 df=3 p=0.001
	Agree	2 (4.3%)	17 (8.4%)	
	Disagree	18 (38.2%)	118 (58.5%)	
	Strongly disagree	21 (44.7%)	51 (25.2%)	
Enjoy transmitting STIs to other men	Strongly agree	16 (34.0%)	58 (28.7%)	χ^2=18.979 df=3 p=0.029
	Agree	10 (21.3%)	62 (30.7%)	
	Disagree	13 (27.7%)	30 (14.9%)	
	Strongly disagree	8 (17.0%)	52 (25.7%)	
Sex with condoms is not natural and	Strongly agree	13 (27.7%)	49 (24.3%)	χ^2=20.995 df=3 p=0.021
	Agree	22 (46.8%)	75	

pleasurable			(37.1%)	
	Disagree	5 (10.6%)	30 (14.9%)	
	Strongly disagree	7 (14.9%)	48 (23.8%)	
Using a condom consistently and correctly reduces risk of infection	Strongly agree	13 (27.7%)	119 (58.9%)	χ^2=33.518 df=3 p=0.001
	Agree	31 (66.0%)	46 (22.8%)	
	Disagree	2 (4.3%)	19 (9.4%)	
	Strongly disagree	1 (2.0%)	18 (8.9%)	

4. Discussions

The study found out that the prevalence of syphilis among men having sex with other men was relatively higher than that of the general population. This was about 10 times higher than that of the entire Kenyan population (6). This may be attributed to the fact that MSMs form part of the most at risk population's thus higher prevalence. This results were contrary with another Kenyan study done in Nairobi which found out that the prevalence of syphilis among men who have sex with other men was slightly lower (7). The results were also inconsistent with a study done in Ghana which found out that the prevalence of syphilis among the homosexuals was higher than this study's (14).Based on self-reported prevalence of Sexually Transmitted Infections among respondents; the study found out that the prevalence of HIV was higher than that of syphilis. This would be because most MSMs infected with syphilis are likely to be HIV positive. These results were consistent with another study conducted in Ghana among prison inmates which showed that syphilis seropostivity was significantly associated with HIV seropostivity (14). This study found out that majority of respondents was aware of syphilis infection. This would be due the fact that Nairobi City is a cosmopolitan region where access to information is relatively easier. Many of the respondents were able to state at least one mode of transmission and symptoms. This was in line with a study done in South coastal region of China which revealed that majority of men having sex with other men had knowledge about syphilis (2). This finding was inconsistent with a study done in Swaziland which showed that there were low levels of knowledge and testing of syphilis among MSMs (15).

Regarding respondents' knowledge on syphilis mode of transmission, majority reported that syphilis among MSMs is largely attributed to unprotected anal sex. The prevalence of syphilis infections among respondents increased with increased exposure to unprotected anal sex. This study concurs with another Kenyan study done in Nairobi City County which found out that majority of respondents attributed high prevalence of syphilis infection among MSMs with exposure to unprotected anal sex (16).

The study found out that majority of respondents had knowledge on syphilis reinfection occurring among medically treated cases. This finding was consistent with a study done in rural Tanzania which revealed that majority of MSMs were aware of syphilis reinfection after cure (17). These results were inconsistent with a Peruvian study which found out that slightly less than half of respondents in MSM cities were knowledgeable about syphilis reinfection. This would be because most MSMs don't notify their partners on their syphilis status hence when they are treated they still go back to their partners for unprotected sex irrespective of their status. These results concurred with study done by Msuya et al (2011), who found out that syphilis reinfection among MSMs was largely attributed to lack of partner notification and presumed trust among couples (18).

Majority of respondents had high knowledge on prevention of syphilis amongst themselves. This was after they were able to identify prevention measures such as abstinence, faithfulness and consistent and correct use of condoms among MSMs partners. These results were contrary to a study done in China which attributed low knowledge levels among MSMs as the contributing factor for the rising prevalence of syphilis infections among most at risk populations (2).

Regarding knowledge on testing frequency for syphilis infection among MSMs engaging in risk sexual behaviors and having multiple partners, majority of respondents revealed that they should be tested frequently. This shows that they had prior access to information or had been counseled and guided on issues to do with syphilis management and treatment in their previous Swop/MSMs clinic visits. This concurs with a study done in Netherlands which advocates for more frequent syphilis testing among MSMs practicing risk behaviors to ensure early treatment thus prevent its transmission to their sexual partners (12).Sexual orientation played a significant role towards syphilis prevalence among MSMs. This study revealed that majority of respondents with positive syphilis status was homosexuals. These findings were consistent with another study conducted in China which showed that there was high prevalence of syphilis infections among the homosexuals (19). This may be attributed to high sexual risk behaviors among MSMs exposing them to contracting syphilis. The study showed that engaging in unprotected sex was a predisposing factor towards syphilis infection among MSMs. Majority of the MSMs revealed that in most cases they do not prefer using condoms while having sex because they presume that sex with a condom is not natural and pleasurable. These results were consistent with a study conducted in Switzerland among Swiss HIV cohorts which revealed that the major source of transmission route was unprotected male-to-male sexual intercourse among the MSMs (20). Lack of consistent condom use among MSMs in North East China was attributed to perceived decreased sexual pleasure, physical discomfort and power imbalances among partners leading to inability to effectively negotiate for condom use (21).

Results revealed that majority of respondents who had more than one sexual partner tested positive for syphilis. This may be due to the fact that as the number of sexual partners increases, the risk of getting infected with syphilis also increases. These findings were in line with a study done in Texas, United States of America, which fund out that risk of syphilis infection among MSMs is worsened by higher number of sexual partners and frequent concurrence of this partners (22). Majority of respondents who most frequently used drugs before engaging in sexual activities tested positive for syphilis infection. This may be attributed to the

fact that drug and substance abuse impairs judgment and therefore affects negotiation for safe sex. This further predisposes these individuals to higher risks of contracting STIs including syphilis. These results were consistent with a study done in Kampala, which revealed that abuse of substances among MSMs is a risk factor towards syphilis infection due to impaired judgment and poor decision making thus exposed to high chances of getting infected (23). The results also concurred with another Brazilian study which showed that use of drugs has been associated with higher risk sexual behaviors, including engaging in unprotected anal sex, having an increased number of sexual partners and consequently higher risk of STD infection (24).

The current study showed that majority of respondents reported to had felt anxious, worried and/or fearful in their past 12 months. The feeling of isolation due to discrimination leads to MSMs feeling worried and anxious about their lives hence may expose them suicidal thoughts. These results were consistent with a study done in a Chinese City which expressed that MSMs activities exposes them to feelings of anxiety, hopelessness and worry (3). This may further lead to men having sex with other men contemplating on attempting suicidal advances due to effects disease progress.

The study showed that majority of respondents was afraid of getting a syphilis infection. This would be attributed to their previous experience with syphilis infection. This might have made them aware of the deadly effects of the disease when it manifests itself into the human body. The results were in agreement with a study done in Uganda, which revealed that attitude towards individuals' perceptions on the condition and thus influence its transmission (25). The attitude of MSMs or the healthcare providers is key to seeking for healthcare services. This makes them suffer in silence and continuing spreading the infection leading increased syphilis prevalence.

The study showed that majority of respondents enjoyed or were not guilty of transmitting STIs to their counterparts. This can be explained by the fact that whenever one is infected they have a feeling of revenge or some go to seek for treatment secretly without informing their partners. Among the commercial male sex workers, they are coerced to engage in unprotected sex for favors. The results of the current study were therefore consistent with a study done in Switzerland which revealed that some men report coerce their anal sex partners to engage in unprotected sex thus leading to high transmission rates among MSMs (13).

5. Conclusions and recommendations

5.1 Conclusions

The prevalence of syphilis among MSMs in Nairobi City County is alarmingly high, despite the concerted efforts that have been put in place to reduce its prevalence. This would be due to lack of partner notifications leading to syphilis reinfection and other associated factors. Majority of the knowledge factors were significantly associated with syphilis status. Possession of correct information on transmission mode, syphilis reinfection and syphilis prevention played a significant role in exposing respondents to contracting the infection. However, despite having this information, MSMs still engage in risk sexual behaviors. The study established that most risk factors had a significant effect on syphilis status among respondents. Engaging in risky sexual activities, drug and substance abuse and psychological distress directly influenced syphilis status among MSMs. Having more than one sexual partner was the most reported risk factor among the infected MSMs. The respondents attitude towards syphilis was moderately gauged among MSMs. Majority of them reported to be afraid of syphilis infection despite them not practicing safe sex such use of condoms. However, many of the MSMs indicated that use of condoms consistently and correctly reduces risk of infections.

5.2 Recommendations

- The relevant NGOs dealing with marginalized groups should expand free syphilis screening and treatment services to the community.
- The relevant stakeholders in health should tailor and scale up MSMs education and sensitization campaigns on facts and best practices related to practice of anal sexual to identify prevention points. This would ensure improved transfer of correct knowledge on preventive measures adopted and frequent testing to ensure early detection and treatment of syphilis among MSMs.
- The relevant stakeholders in health should provide psycho-social support such as counselling services and help reduce stigmatization associated with MSMs among the general public. MSMs should be helped to form social groups to help share information amongst themselves and champion for their rights.
- The relevant stakeholders in health should help demystify beliefs associated with syphilis infections. They should also be encouraged to improve their attitude towards syphilis through engaging in activities that would help them live a positive life.

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