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HIV Prevalence and Related Risk Behaviors among Men Who Have Sex with Men in Kinshasa, the Democratic Republic of the Congo

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ABSTRACT

The purpose of this study was to determine the prevalence of HIV and syphilis and examine the HIV-related behaviors among men who have sex with other men (MSM) in Kinshasa, Congo. A modified snowball sampling was used to recruit the participants. The results showed that among the 401 men studied, 23.7% and 11.2% were infected with HIV and syphilis, respectively. HIV risk behaviors were rampant in this population. In the last 6 months preceding the survey, 83.3% of MSM reported receptive anal sex (RAS) with an average of 7 sexual partners. As high as 37.7% of MSM did not use condoms during the last RAS. About 65.9% (n = 249) reported drinking alcohol before sex. Logistic regression model indicated that being diagnosed with syphilis and not using lubricant were associated with positive HIV test. High-risk behaviors coupled with high prevalence of HIV among MSM underscore the need for the National HIV Control program to design new interventions to prevent HIV transmission from the MSM community into the general population.

Keywords: sexually transmitted diseases, HIV prevalence, syphilis, sexual risk behaviors, MSM, Congo-Kinshasa

INTRODUCTION

Globally, the number of new cases of HIV infection has declined by 16% since 2010, resulting in a decrease in the number of people living with HIV (Joint United Nations Programme on HIV/AIDS, 2018). In Western and Central Africa, 6.1 million people were living with HIV in 2017, with 370,000 new infection cases. Female sex workers (FSW), men who have sex with men (MSM), injection drug users (IDU), and people in uniform (police officers, soldiers, and prisoners) represent the groups most at risk of acquiring HIV. Commonly called key populations, they account for 47% of new HIV infections globally. Because the risk of HIV is 27 times higher among MSM than in the general population, they bear a disproportionate burden of HIV worldwide (Joint United Nations Programme on HIV/AIDS, 2018). In 2017, gay men and other MSM accounted for an estimated 12% (approximately 44,000) of new infections in Western and Central Africa. The prevalence of HIV among MSM in sub-Saharan Africa varies widely among countries. It was estimated at 1.9% in Burkina Faso and 17.6% in Tanzania in 2017 (Joint United Nations Programme on HIV/AIDS, 2018). In a study conducted in eight African countries, Poteat et al. (Poteat et al., 2017) reported an overall prevalence of 14% among MSM, with the highest prevalence observed in Lesotho (29%) and Senegal (28%).

Several factors explain the high prevalence of HIV among MSM. Anal sex is one of the highest risk factors of acquiring HIV (Patel et al., 2014) The high prevalence of sexually-transmitted infections (STIs) in this population heightened the risk of HIV transmission (Fleming and Wasserheit, 1999). In addition, structural factors contribute to the high prevalence of HIV in this population. Analyzing AIDS National Strategic Plans (NSPs) from 46 African countries, Makofane et al. (2013) found that, overall, the governments of the countries studied had little knowledge of the social dynamics behind MSM's HIV risk. Hostile legal environments, repressive policies, unfair police practices, absence of funding for research and HIV programs, human rights violations, stigma, and discrimination drive members of key populations underground and further reduce the chances for their access to antiretroviral therapy or participation in HIV trials. The homophobic stigma from family members, churches, and society affect an individual's sense of personal worth. Lack of self-esteem arising from stigma has been shown to reduce a person's motivation to protect themselves or others from high risk behaviors (Smart Richman and Leary, 2009). Intersectional stigmas of same-sex practices, commercial sex, and HIV all

augment risk for HIV and sexually transmitted infections among MSM and reduce their likelihood of accessing essential services (Baral et al., 2015).

In the Democratic Republic of the Congo (DRC), the number of HIV cases has been on the decline from 580,000 in 2005 to reach 390,000 in 2017. Of the 390,000 adults and children living with HIV in 2017, 95,000 were men aged 15 years and over. MSM accounted for 3.2% of this population with an estimated HIV prevalence of 3.3% (Joint United Nations Programme on HIV/AIDS, 2018). Despite the high number of HIV cases in the DRC, there is a dearth of information about the epidemiology of HIV in most at-risk groups, including MSM. The purpose of this study was to estimate the prevalence of HIV and syphilis and describe the risk behaviors associated with HIV/AIDS among MSM living in Kinshasa, DRC.

METHODS

Study Design and Sampling

This is a cross-sectional study of MSM living in Kinshasa. Inclusion criteria included being aged 18 years or older, having a history of oral or anal sex with other men in the past six months, residing in Kinshasa for the last 12 months, and being able to communicate in French or local languages. Individuals who met these conditions were invited to participate in the study. A modified snowball sampling approach was used from July to August 2018 to enroll the participants. Five administrative zones where MSM live (Selembao, Bumbu, Lemba, Ndjili, and Masina) were purposefully selected in Kinshasa. In each zone, the research staff selected 8 MSM group leaders. Every leader was asked to share the co-principal investigator's contact with MSM in his network and to encourage up to 10 of them to call the co-principal investigator to participate in this study.

Sample Size

The sample size was determined using the online Raosoft Sample Size calculator (http://www.raosoft.com/samplesize.html). The total population of MSM in Kinshasa was estimated at 20,000 individuals. Using the confidence level of 95% with 5% margin of error with the response rate of 50%, a sample size of 357 was needed for the study. Adjusting for out migrations, deaths or nonresponse, a total of 401 individuals were recruited.

Data Collection

The choice of variables to study was guided by previously conducted studies (Koblin et al., 2003; Ouedraogo et al., 2019; Park et al., 2013; Qi et al., 2015). A pretested questionnaire was used to collect the following information:

Demographics and contextual variables

Information was collected on participants' age (coded as <20, 20-24, and 25 or older), education attainment (primary or less/US elementary, secondary/US high school, some college), religion (Christian, Muslim, none), marital status (never married/single, single but living with sex partner, married to a woman), employment/source of income (unemployed, partly employed, fully employed, self-employed, temporary jobs, informal jobs), place of residence/type of dwelling (homeless, house, flat/apartment, rented room, shack, shelter), sexual orientation (bi-sexual, homosexual, I am not sure), monthly income in US$ (<50, 50-99, 100 or more), and MSM subpopulation self-identity (yes/no).

Sexual risk behaviors

Study participants were asked about the number of male sexual partners (including regular partners and casual partners (defined as an occasional or new sex partner) in the past 1 month and 6 months. They were asked about the number of times they engaged in insertive or receptive anal sex with or without using condoms. Participants were also asked about their substance use before sex, including alcohol, marijuana, and cocaine (yes/no; if yes, then the type of substance used).

Laboratory exams

A finger-tip blood sample was utilized for syphilis and HIV testing, with results reported as positive or negative. A trained nurse administered a rapid HIV test, Determine Combo (Abbott Inc., Chicago, USA), to test for HIV. Determine Combo is a fourth-generation assay able to simultaneously detect HIV-1 p24 antigen and HIV-1/2 antibodies. The high-test sensitivity of 95% (88–98%) and specificity of 100% (90–100%) make this test suitable as a point-of-care rapid HIV test in clinics and outreach testing sites (Stekler et al., 2016). The Abbott Determine Rapid Syphilis TP assays is a treponemal test used in resource-poor settings that lack laboratory facilities. The test has a sensitivity of 96.9 to 99.2% and a specificity of 95.5% to 100% (Diaz et al., 2004). A unique non-identifying secret code was developed for each participant and was placed on all the study documents to identity the participant. Participants underwent a voluntary pre and post HIV testing. Those who tested positive were referred to participating government clinics for care.

Statistical Analysis

Descriptive and bivariate analyses were conducted to describe the characteristics of the participants and the prevalence of HIV and related risk behaviors. The multivariable logistic regression analysis was run to assess the independent association of the independent variables with the outcome of interest: HIV testing. All explanatory variables were adjusted for age, education, and sexual orientation in multivariate analysis.

Ethics

This study was approved by the Central Michigan University internal review board (IRB) in the United States and the Ethics Clarence Committee of the School of Public Health in the Kinshasa in the Democratic Republic of the Congo.

RESULTS

Demographics

A total of 401 MSM participated in this study. Their demographic characteristics are shown in **Table 1**. The ages of participants ranged from 18 to 44 years, with a median age of

Table 1. Sociodemographic Characteristics of Participant MSM in Kinshasa, DRC, 2018

Variable	n (%)
Sociodemographic Characteristics	
Age	
<20	47 (11.7)
20-24	**197 (49.1)**
25 or Older	157 (39.2)
Education Attainment	
None or Don't Know	13 (3.2)
Primary School (US Elementary)	47 (11.7)
Secondary School (US High School)	**264 (65.8)**
College/Higher Education	77 (19.2)
Religion	
Christian	**349 (87.0)**
Muslim	5 (1.2)
Traditional	44 (11.0)
None	3 (0.7)
Current Marital Status	
Single/Never married	**392 (97.8)**
Single but living with sex partner	6 (1.5)
Married to a woman	3 (0.7)
Sexual Orientation	
Bi-sexual	83 (20.7)
Homosexual	**314 (78.3)**
Not sure/Don't know	4 (1.0)
Type of Dwelling	
Homeless	12 (3.0)
House	**283 (70.6)**
Flat / Apartment	11 (2.7)
Rented room	23 (5.7)
Shack	69 (17.2)
Shelter	3 (0.7)
Employment/Income Status	
Unemployed	**120 (29.9)**
Partly employed	8 (2.0)
Fully employed	6 (1.5)
Self-employed	173 (43.1)
Temporary jobs	9 (2.2)
Informal jobs	85 (21.2)
Average Monthly Income, in $*	
<50	79 (28.1)
50 – 99	**111 (39.5)**
100 or More	91 (32.4)

23.0 years. Overall, 60.8% (n=244) of participants were 18 to 24 years old, 65.8% (n=264) attained secondary level of education, 87.5% (n=349) were Christians, and 97.8% (n=392) were single. More than 70.6% (n=283) lived in their parents' houses and slightly less than 30% (n=120) did not have any type of income (unemployed). Most participants described themselves as either homosexual (78.3%, n=314) or bisexual (21.7%, n=87).

Sexual Behavior, Condom and Lubricant Use, Alcohol Consumption

Sexual behaviors with men

Participants' sexual behaviors are displayed in **Table 2**. Multiple sexual partnerships were common among MSM. The average number of the self-reported sex partners was 7.3 (SD= 7.45) in the past 6 months, with more than one-third of them (36.9%, n=148) reporting having more than 11 male partners in those six months. These sex partners were either regular partners (76.1%, n=305), casual partners (18.0%, n=72), or paying partners (5.9%, n=24). About 38.2% of the participants (n=153) reported that they were not aware of their sex partners' HIV serostatus.

Table 2. Sexual Behaviors, Condom and Lubricant Use, Alcohol and Drug Consumption Among MSM in 2018

Variable	n (%)
Sexual Behaviors, Condom and Lubricant Use	
With Men	
Number of Male Sex Partners in the past 6 months	
5 or less	181 (45.1)
>5	220 (54.9)
During the past one (1) month, number of anal sex you had with men	
0 or 1	42 (11.2)
>1	333 (88.8)
Number of Male Receptive Partners in the Past One (1) Month	
0	345 (86.0)
⩾1	56 (14.0)
Number of Male Insertive Partners in the Past One (1) Month	
0	67 (16.7)
⩾1	334 (83.3)
Types of sexual partners	
Regular partners	305 (76.1)
Occasional partners	72 (18.0)
Paid partners	24 (5.9)
Did you know the HIV serostatus of the man you had sex with the last time?	
The partner told you that he is seronegative, but you are not sure	126 (31.4)
I knew that the partner is seronegative	122 (30.4)
You did not know his HIV serostatus	153 (38.2)
The last time you had anal sex with a man, was a condom used?	
No	151 (37.7)
Yes	250 (62.3)
If the condom was not used, why did you and your partner not use a condom?	
I was paid not to use condom	3 (2.0)
I paid my partner not to use condom	4 (2.6)
It was not necessary	7 (4.6)
I don't like the condom	12 (7.9)
My partner opposed the use of condom	25 (16.6)
I had the relation with a regular client, and we trust each other	24 (15.9)
Just the heat of the moment	1 (0.7)
Condoms not available	75 (49.7)
The last time you had sex with a male partner, did you and your partner use a lubricant other than the saliva?	
No	101 (25.2)
Yes	300 (74.8)
If yes, what was the type of lubricants used?	
Body lotion	114 (38.0)
Lubricant IDA	72 (24.0)
Water-based lubricant	108 (36.0)
Other	6 (2.0)
With Women	
Have you ever had a sexual relationship with a woman?	
No	276 (68.8)
Yes	125 (31.2)
If yes, have you ever had anal sex with a woman? (n=122)	
No	111 (91.0)
Yes	11 (9.0)
The last time you had sex with a woman, was a condom used? (n=120)	
No	56 (46.0)
Yes	64 (54.0)
Why a condom was not used? (n=56)	
Not available	28 (50.0)
Do not like condom	12 (21.4)
Did not think it was necessary	4 (7.1)
Urge of the moment	3 (5.4)
Partner opposed	3 (5.4)
I knew the partner	6 (10.7)
Alcohol and Drug Consumption	
In the past month, did you consume alcohol before having sex? **	
Yes	164 (65.9)
No	85 (34.1)
In the past 1 month, have you used drug before sex?	
Yes	44 (63.8)
No	25 (36.2)
In the past 1month, which drug have you used before sex?	
Local cocktail (Guegue)	3 (6.8)
Marijuana	23 (52.3)
Cocaine	10 (22.7)
Heroin	4 (9.1)
Others	4 (9.1)

** Based on 62.1% of respondents (n= 249) who reported drinking alcohol in the past month.

During the past one (1) month, the vast majority (83.3%, n=334) of participants reported having had receptive anal sex, whereas 13.9% (n=56) had insertive anal sex. During the last sexual encounter, more than a third of MSM (37.7%, n=151) did not use a condom. The most commonly reported reasons for not using a condom with a male partner were: "unavailability of condoms" (49.7%, n=75), "partner refusal to use a condom" (16.6%, n=25), and "having sex with a regular partner" (15.9%, n=24). Among those who used a condom (62.8%, n=250), 74.8% (n=300) of them used lubricants. Body lotion (38.0%, n=114) and water-based lubricants (36.0%, n=108) were the most frequently used lubricants in this population.

Sexual behaviors with women

A third of participants (31.2%, n=125) reported ever having sexual relationship with a woman. Among them 9% (n=11) reported having anal sex. About 19.4% (n=24) of the participants reported having at least two (2) female sexual partners in the month preceding the interview. Slightly less than half of the respondents (46%, n=56) who ever had sexual relationship with a woman did not use a condom during the last sexual encounter with a woman. The two main reasons for not using the condom were "unavailability of condoms" (50.0%, n=28) or "dislike of using condom" (21.4%, n=12).

Alcohol and drug consumption

Alcohol consumption before sex was commonly reported among MSM. Sixty-five percent (n=164) of the 249 participants who consumed alcohol in the last one month before the study, reported having regularly consumed alcohol before sex. Fifty-two percent (n=23) and 22.7% (n=10) reported having used marijuana and cocaine, respectively.

History of Sexually Transmitted Infections and Status

Table 3 summarizes participants' responses about the history of STIs and their serostatus. Most respondents (82.5%, n=331) reported ever testing for HIV and receiving the test results. One fourth of them underwent testing at HIV counselling and testing sites (41.7%, n=142) or mobile clinics (26.2%, n=89). When asked to react to the following statement, "I am at risk of acquiring HIV infection", 24.4% (n=98) and 28.7% (115) of MSM disagreed or strongly disagreed with the statement, respectively. This low perception of HIV risk in this population, however, contrasted with the high prevalence of STIs. During the 12 months preceding the interview, one-quarter of the respondents (27.7%, n=111) reported symptoms suggestive of sexually transmitted infections such as a discharge from the penis, sore, blister or ulcer on the penis or a sore, blister or ulcer around the anus. Overall, 11.2% (n=45) of respondents tested positive for syphilis and 23.7% (n=95) tested positive to HIV-Combo (test combining HIV antigens and antibodies against HIV).

Factors Associated with HIV Infection

We conducted a bivariate analysis (Pearson chi-square test) to identify the different variables associated with HIV infection (HIV Combo test). The results of the bivariate analysis are shown in **Table 4**. Of all the variables studied, only history of syphilis was significantly associated with HIV infection [Odds ratio (OR)=8.95; 95% confidence interval (CI): 4.56-17.60].

Table 3. History of Sexually-Transmitted Infections and Status among MSM in 2018

Variable		n (%)
Perceived Risk of Acquiring HIV		
"I'm at Risk of Acquiring HIV"		
	Strongly agree	78 (19.5)
	Agree	93 (23.2)
	Disagree	98 (24.4)
	Strongly disagree	115 (28.7)
	Do not know	17 (4.2)
HIV/STI History and Testing		
Ever been tested for HIV and received the result?		
	No	70 (17.5)
	Yes	**331 (82.5)**
Where did you go the last time to get tested for HIV?		
	Health center	48 (14.1)
	HIV Counseling and Testing sites	**142 (41.7)**
	Private Clinic	31 (9.1)
	Public hospital	25 (7.4)
	Self-testing	5 (1.5)
	Mobile clinic	89 (26.2)
Have you had or suspected yourself of having any STI in the past 12 months?		
	No	**283** (70.6)
	Yes	118 (29.4)
History of STI		
	No	**228 (56.9)**
	Yes	173 (43.1)
Test Results		
HIV - Combo		
	Negative	306 (76.3)
	Positive	**95 (23.7)**
Syphilis		
	Negative	356 (88.8)
	Positive	**45 (11.2)**

Table 4. Bivariate Analysis or Unadjusted Regression Analysis for HIV Status among MSM in 2018

Variable		HIV Status		p-value
		Positive n (%)	Negative n (%)	
Age, years				*.774*
	<25	59 (24.2)	185 (75.8)	
	25 or Older	36 (22.9)	121 (77.1)	
Education Attainment				*.944*
	Primary School or Less	14 (23.3)	46 (76.7)	
	Secondary School or Higher	81 (23.8)	260 (76.2)	
Sexual Orientation				*.137*
	Bi-sexual	25 (30.1)	58 (69.9)	
	Homosexual	70 (22.3)	244 (77.7)	
Income Status				*.36*
	No Income	32 (26.7)	88 (73.3)	
	Has Any Type of Income	63 (22.4)	218 (77.6)	
Number of Male Sex Partner in the Past 6 Months				*.835*
	⩽ 5	42 (23.2)	139 (76.8)	
	> 5	53 (24.1)	167 (75.9)	
Number of Insertive sexual contacts in the Past One (1) Month				.064
	0	10 (14.9)	57 (85.1)	
	⩾1	85 (25.4)	249 (74.6)	
Use of Lubricant Other Than Saliva at Last Sex with a Male Partner				*.1*
	No	30 (29.7)	71 (70.3)	
	Yes	65 (21.7)	235 (78.3)	
Syphilis test				*<.001*
	Negative	65 (18.3)	291 (81.7)	
	Positive	30 (66.7)	15 (33.3)	

Table 5. Adjusted Odds Ratio (OR) for HIV Status among MSM in 2018

Variable	Multivariate Regression	
	Adjusted OR	95% CI for OR
Age, years		
<25	.92	.55-1.56
25 or Older	1	Ref.
Education Attainment		
Primary School or Less	.98	.47-2.03
Secondary School or Higher	1	Ref.
Sexual Orientation		
Bi-sexual	1.4	.77-2.58
Homosexual	1	Ref.
Use of Lubricant Other Than Saliva at Last Sex with a Male Partner		
No	1.9	**1.05-3.45***
Yes	1	Ref.
Number of Insertive sexual Contacts in the Past One (1) Month		
0	1	Ref.
⩾1	3.47	**1.52-7.96***
Syphilis test		
Negative	1	Ref.
Positive	11.69	**5.62-24.35****

Although age, education attainment, and sexual orientation were not associated with HIV testing in the bivariate model, they were, nevertheless, included in the regression model.

After controlling for these variables (**Table 5**), participants who reported not using lubricant were twice as more likely to be HIV positive (OR= 1.9, 95% CI: 1.05 – 3.45) compared to those who used lubricant. MSM diagnosed with syphilis were significantly more likely to be HIV positive (OR = 11.69, 95% CI: 5.61-24.35) compared to their negative counterparts. Those who reported one or more insertive intercourse in the past one month were three times as likely to be HIV positive (OR=3.47, 95% CI: 1.52-7.96) than those who did not engage in a receptive sex in the past one month.

DISCUSSION

This exploratory study was conducted to collect baseline information on the prevalence of HIV and related risk behaviors among MSM in Kinshasa, the capital city of the DRC.

The study showed a prevalence of HIV as high as 23.7% among MSM in Kinshasa. This rate is 24 times higher than the prevalence of 1.0% reported in the general population (Kokolomami and Kayembe, 2018). In addition, MSM in Kinshasa were engaged in a wide variety of high-risk behaviors. Most participants (83.3%, n=334) reported having receptive anal sex in the last one month. They reported having 7 sex partners on average during the past six months. Anal sex and multiple sex partnership have been shown to be associated with high risk for HIV. In a cross-sectional study among 272 MSM in Douala, Cameroon, Park et al. (2013) found that receptive anal sex was associated with increased odds of having HIV (OR 2.33, 95% CI 1.02–5.32). The central role of receptive anal sex in the disproportionate burden of HIV among MSM has been long established (Beyrer et al., 2012). HIV RNA was found at high levels in rectal secretions, even in men receiving Antiretroviral Treatment (ART), and paired HIV RNA levels in rectal secretions were greater than those in either the blood or seminal plasma among HIV-infected MSM from Seattle, Washington, and Lima, in Peru (Zuckerman et al., 2004).

Individuals who report multiple sexual partners are at high risk of contracting HIV as each new relationship introduces another pathway for HIV transmission. Concurrent sexual partnerships, defined as having two or more partnerships that overlap in time, have been shown to contribute to the spread of HIV (Morris and Kretzschmar, 1997). Studying 4,295 HIV-negative MSM enrolled in a randomized behavioral intervention trial in six US cities, Koblin et al. (2006) found that men who reported four or more male sex partners, unprotected receptive anal intercourse with any HIV serostatus partners, and unprotected insertive anal intercourse with HIV-positive partners, were at increased risk of HIV infection. Furthermore, when assessing HIV prevalence and associated risk factors among 753 MSM in Daar es Salaam, Tanzania, Mmbaga et al. (2018) found that individuals engaged in group sex were nearly four times (OR, 3.8, 95% CI: 1.6 to 8.4) more likely to contract HIV than those who did not.

In our study, alcohol use was relatively common among MSM. Of the 249 respondents who reported drinking alcohol during the last month, nearly two thirds (65.9%, n=164) drank alcohol regularly before sex. Shillington, Cottler, Compton, and Spitnagel (1995) found that participants classified as “Heavy drinkers” were more likely to report engaing in sexual acts outside of marriage, multiple sex partners in a year, and sex trading (i.e., exchanging sex for money, drugs, or lodging) when they were compared to “non heavy drinkers”. To investigate the effects of alcohol intoxication and sexual arousal, Maisto et al. (2012) studied 117 MSM aged 21–50 years who were randomly assigned to one of six separate experimental conditions created by the combination of beverage administration (water control, placebo or alcohol designed to raise blood alcohol level to .07%). The results of the study showed general support for the enhancement of alcohol’s effects on sexual risk by both sexual arousal and expectancies. About half (52.3%, n=23) of the 44 respondents who reported drug use consumed marijuana, and one out of four of them (n=10) consumed cocaine during the last month before sex. Previous studies reported higher rates of illicit substance use among MSM compared to the general US population (Cochran et al., 2004; Stall et al., 2001). Alcohol consumption and illicit drug use impair judgment during sexual intercourse, potentially decreasing the likelihood of condom use (Steele and Josephs, 1990). We found that one-third of the respondents did not use a condom at the last sexual encounter. Although meta-analyses of studies with MSM and non-MSM specific studies failed to definitely support a direct influence of alcohol on sexual behavior, several studies of MSM do demonstrate an association between alcohol consumption and condom use (Allen et al., 2015).

Condom use is an effective and reliable preventive intervention available. However, despite the health education efforts during the last 30 years of the HIV epidemic to prevent the transmission of HIV in the Congo, one-third of the

participants reported to have not used a condom at the last sexual encounter. Unavailability of condoms was the most commonly reported reason (49.7%, n=75). The availability of a product is a required condition for a person to take action (Fishbein and Ajzen, 1977; Paul et al., 2016; Vermeir and Verbeke, 2008). In addition to making the condoms accessible in the community, MSM should be educated to use condom consistently instead of being influenced by their partners' physical appearance or length of their relationship (Musinguzi et al., 2015).

The strong association between STI and the risk of HIV infection is another strong finding for this study. MSM diagnosed with syphilis were significantly more likely to be HIV positive compared to their negative counterparts. Strong evidence from the literature indicates that both ulcerative and non-ulcerative STDs promote HIV transmission by augmenting HIV infectiousness and HIV susceptibility via a variety of biological mechanisms (Patel et al., 2014). Breaks in the genital tract lining caused by genital ulcers (e.g., syphilis or herpes) create a portal of entry for HIV and inflammation resulting from genital ulcers or non-ulcerative STDs (e.g., chlamydia and gonorrhea) increases the concentration of cells in genital secretions that can serve as targets for HIV (e.g., CD4+ cells). Furthermore, HIV infected individuals who are also infected with other STDs are particularly likely to shed HIV in their genital secretions (Cohen et al., 1997).

Self-perceived HIV risk, which is a person's perception of the likelihood that he/she will contract the disease, is an integral component in motivating avoidance of HIV risk (Gerrard et al., 1996; Rosenstock, 1966). Incongruency between self-perceived and actual risk could affect the proclivity to engage in self-protective behaviors, such as condom use and result in missed opportunities to identify HIV infection; because, patients might refuse HIV testing out of a false belief that they are at a low risk for an infection (Pringle et al., 2013). The high prevalence of HIV among MSM underscores the need for more effective interventions targeting this community.

This study also showed that having not used lubricant at last sexual intercourse and practicing insertive sex were significantly associated with HIV infection in this population. The benefit of lubricant remains contradictory in the literature. Use of lubricants may help minimize potential skin tears and condom damage, thereby reducing the likelihood of HIV transmission (Chow et al., 2011). In a prospective study, Golombok et al. (2001) found that condom breakage was associated with the type of additional lubricant used. Another study by Steiner et al. (1994) found an association between additional water-based lubricant use and reduced breakage rates for aged condoms but not for new condoms. However, in a prospective study, Smith et al. (1998) found that additional lubricants had no effect on slippage and breakage during vaginal intercourse (Smith et al., 1998). Further studies are needed to shed the light of the true association between lubricant use and condom breakage.

Our study reported a high HIV prevalence of 23.7% among MSM in Kinshasa compared to the prevalence of 1.0% estimated in the general population (Kokolomami and Kayembe, 2018). The HIV epidemic in the Western and Central Africa sub-region presents distinct dynamics compared to the rest of sub-Saharan Africa. In Western and Central Africa, the prevalence of HIV in the general population remains generally low, with 12 of 24 countries reporting a national HIV prevalence of less than two percent. However, the prevalence among key populations (KP) in the region is three (3) to 30 times higher than the general population (Papworth et al., 2013). For example, Cameroon has a 3.8% HIV prevalence in the general population compared to 28.6% among MSM in Douala and 47.3% in Yaoundé. The 2012 HIV-related behavioral survey in four locations across the Republic of Congo (Brazzaville) (Cuvette-Ouest, Plateaux, Pool, and Lékoumou), found a HIV prevalence of 3.2% in the general population aged 15–49 years and 26.1% among MSM (Linguissi et al., 2018). Considering that Western and Central Africa is the most populous region of sub-Saharan Africa, with an estimated population of 356 million living in 24 countries, the high prevalence of HIV among MSM is a matter of concern. Bisexual behavior or down-low behavior could facilitate the transmission of HIV infection back into the general population, creating a new HIV epidemic in the region. Ending the HIV epidemic in the Democratic Republic of the Congo will require new, innovative, and scalable interventions that promote access to health services among populations at risk (UNAIDS, 2016).

In 2014, the UNAIDS launched the Fast-Track strategy to step up the HIV response in low- and middle-income countries to end the AIDS epidemic by 2030 (Joint United Nations Programme on HIV/AIDS, 2014). The Fast Track strategy sets out targets for prevention and treatment, known as the 90-90-90 targets. This includes diagnosing 90% of all HIV-positive persons, providing antiretroviral therapy (ART) for 90% of those diagnosed, and achieving viral suppression for 90% of those treated by 2020 (Stover et al., 2016). MSM in DRC are not effectively targeted by the national efforts to reach the 90-90-90 targets. This study findings underscore the needs for the national HIV control program to refocus its efforts on this key population.

Limitations

This study has some limitations. This cross-sectional study was based on self-reported information about behaviors that took place in the last six months. Recall bias may have affected their answers. Participants may have not answered all the questions accurately considering that the questions asked for private and personal information. Furthermore, the sample of MSM, drawn from 5 administrative zones out of 24, may not be representative of the entire population of MSM living in Kinshasa. One must therefore be cautious in generalizing the findings to the entire population of MSM in Kinshasa. Finally, the wide 95% confidence interval observed in the Logistic regression analysis raises concern about the variability of the data.

CONCLUSION

HIV prevalence is high among MSM in Kinshasa. The wide variety of high-risk behaviors in this population underscores the risk of HIV transmission back into the general population. To prevent the development of a new HIV epidemic in the

country, the National HIV Control program must design a new, effective, and innovative program that addresses the health needs of people most at risk for HIV, including MSM. National HIV Control program in the Congo and throughout Africa should recommend the use of the fourth-generation assays rapid HIV testing to simultaneously detect HIV-1 p24 antigen and HIV-1/2 antibodies. Early HIV detection will trigger early care and management.

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