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ORIGINAL ARTICLE

Factors Associated with Not Being Tested for HIV among MSM Population in Bamako, Mali

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Abstract

Men who have sex with men (MSM) are known to have a higher risk of being infected by HIV. Clinical and public health programs need to incorporate strategies to increase regular HIV testing among MSM in order to control and prevent new infections. A cross-sectional bio-behavioral survey among MSM in Bamako, Mali, was conducted using respondent-driven sampling to study factors associated with not being HIV tested in this vulnerable population. The study participants were ≥ 18-years-old and had had sex with another man in the preceding six months. We interviewed 552 MSM including 550 who were tested for HIV. HIV prevalence found in the study among MSM in Bamako was 13.7%. More than a quarter of the MSM population, 27% had not been tested for HIV. Factors associated with not being tested for HIV included older age, the type of occupation, the use of alcohol and a history of sexual assaults. These results can be used to inform and strengthen the current strategies to meet this urgent need to improve accessibility of HIV testing services for MSM population. Given the prevalence of the disease in this group and their high exposure to HIV, discriminations and stigma associated with their sexual orientation, a targeted and appropriately tailored strategy is required.

Keywords

MSM, HIV, Testing, Bamako, Mali, Factors-associated

Introduction

Globally, men who have sex with men are disproportionately impacted by HIV, due in part to sexual risk behaviors [1,2]. Male-to-male sexual contact has been one of the most important routes of HIV transmission. Despite progress, MSM still remain a highly vulnerable population even in high-income countries [3].

Even in situations of generalized HIV epidemics in sub-Saharan Africa, MSM have three to four times more likely to be infected than the general adult population [4]. Studies conducted in many African countries have found high proportion of unprotected anal sex between men. In addition, it has been reported in Senegal survey and voluntary counseling and testing data from Kenya that MSM have much higher prevalence of HIV infections when compared to their corresponding national prevalence estimates [5]. A review of the global epidemiology of HIV infection among MSM found an estimated HIV prevalence of 18% among MSM in sub-Saharan Africa [6].

The MSM population is less comfortable discussing sexuality with anyone, which makes it difficult for them

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to access appropriate healthcare [7,8]. The stigma and homophobia that they experience, negatively influence access and utilization of critically needed protective health behaviors [9]. Fear of criminal prosecution and of moral judgment keeps MSM from getting closer to health care services [10], in order to be screened for HIV. The strategies for MSM therefore need to be revised and adapted to each local context and reality for a better efficiency [11].

A study conducted between 2014 and 2015 showed that the majority of the positive results of their study were found among MSM (more than 90%) and underlines that MSM are prone to stop using condoms since the introduction of a new prophylactic treatment that prevents HIV transmission, which increases their vulnerability [12]. In Senegal and Ivory Coast, a high proportion of MSM tested for HIV in 2012, with 56-70% of MSM in Senegal [13,14], and 62.6% in Ivory Coast [15]. Similarly to these two countries, HIV epidemic in Mali is an important concern for some specific subpopulations including MSM [16,17]. However, very few studies have been conducted in MSM in Mali. Available data are mainly from three studies. Two studies revealed that MSM from Bamako were regularly subject to acts of discrimination and stigmatization [18,19]. The study conducted in Segou, Mali reported the same issues or both the sex workers and the MSM, especially in the rural areas of the region. Stigmatization and discrimination, could be significant barriers to HIV screening and prevention [20]. As it is difficult to reach MSM, screening remains a challenge for HIV prevention, and that is exactly the reason why we initiated this study to determine factors associated HIV testing in MSM population in Bamako.

Methods

Study type

A cross-sectional bio-behavioral survey was conducted in Bamako among MSM between October 2014 and February 2015. The survey was conducted in two study sites, which ensured discretion and were easily accessible for potential participants to the study.

Sample size and study population

The required sample size for the study was 550 participants based on an estimated HIV prevalence of 20% among MSM, a 95% confidence interval with a ± 5% margin error and a design effect of 2.0.

To participate in the study, volunteers needed to be man that had oral or anal sex with another man in the past six months before enrollment, aged ≥ 18 years, lived in Bamako or its suburbs for the past six months, able to speak French or Bambara, able to provide written consent and have a valid recruitment coupon, not be under the influence of alcohol or drugs.

Variables

Dependent variable was the concept of HIV test (yes or no) before this study. For independent variables such as Sociodemographic characteristics, Stigma and Discrimination, sometimes recoding was made by grouping variables modalities as was the case for the profession.

Recruitment and sampling

The study used Respondent-driven sampling (RDS) to recruit MSM participants in Mali who are a hidden population that is difficult to reach using conventional survey methods. RDS is a version of snowball sampling that weights responses based on network size and recruitment patterns. RDS is considered a representative method for identifying populations without a sampling bias [21-24].

Recruitment began with the selection of six "seeds" who were the initial participants to reflect the diversity of social networks. An additional seed was added during the survey in order to diversify the age structure of the participants.

The seeds, after being interviewed and tested for HIV, were given three coupons to recruit three MSM from their networks, and so on. All participants in the study had to have a valid coupon for enrollment. The numbered coupons, which enabled investigators to establish links between participants and their chains and ensure appropriate weighting for RDS analysis purposes, were limited to three to ensure that the recruitment chains were as long as possible and gave all participants the same opportunity to recruit others from their network. The coupons were tracked on RDS Coupon Manager (a Microsoft Excel spread sheet).

Study procedures

At each study site, once the potential participant has a valid coupon, he was then invited to confirm the eligibility criteria to participate in the study. Written informed consent was obtained for the initial interview and all other steps of the study including finger pricks for HIV testing and collection of dried blood spots for storage and future testing. Participants answered a questionnaire administered by interviewers either in French or Bambara using computer-assisted interview with tablets. The responses were recorded in the encrypted and password-protected tablets.

The first visit questionnaire included 13 sections. Participants who consented to HIV testing received pretest counseling, a rapid test using Mali's national HIV screening algorithm, and post-test counseling on the disease's modes of transmission and risks. Determine® rapid test was used as a first-line test; The positive cases were confirmed using the Clearview® rapid test. The HIV counselor recorded the result of the rapid test in the HIV test registry using the study ID number.

Three dried blood spots (DBS) identified by the study identification number were collected and sent to the laboratory of the National Institute of Public Health Research (INRSP) in Bamako for external quality control. Positive cases were subjected to additional DBS for viral load, genotyping and incidence. All positive HIV cases and a random sample of HIV-negative were confirmed by quality control.

At the end of the first visit the participants received a primary compensation of 4000 CFA (around 8 US $) after completing the survey to compensate for their time (2000 CFA) and transportation (2000 CFA). In addition, condoms, lubricants, and information on HIV prevention and treatment were provided to all participants. An appointment was given for a second visit where another questionnaire was introduced, providing information on the number and peer characteristics that they approached. If the coupons distributed by a participant have been registered as being reimbursed. Participants received a secondary compensation of 1,000 CFA francs (approximately US$2) for each candidate's referral (up to three) and an additional 2,000 CFA francs (approximately US$4) for transportation (Total maximum 5000 CFA francs, or approximately US$10).

Reference for care and treatment

The participants tested positive were referred to selected health centers for care, support and treatment, in which at least one clinician from each of the centers had attended a two-day stigma-reduction training prior to study start.

Data analysis

Data from all databases was merged into one, verified and cleaned in SAS (Version 9.3) and exported to RDS analyst (Version 7.1). Network size was used to weight the data using RDS Analyst in order to produce estimates of the specific population prevalence and 95% confidence intervals for key variables. The RDS-II estimator was used to estimate the prevalence of the population [25]. We did univariate descriptive analyzes taking into account the socio-demographic characteristics of the MSM, stigmatization and discrimination. For the analytical aspect, bi and multivariant logistic regressions based on adjusted odds ratios (OR) and OR (ORa) with 95% confidence intervals (CI) to identify factors associated with not being tested for HIV, MSM have been completed. A $p < 0.05$ was considered statistically significant [25].

Ethical considerations

The study protocol was approved by the ethics committees of the United States Center for Disease Control and Prevention (CDC) Atlanta, Columbia University Medical Center Institutional Review Board and the Faculty of Medicine, Pharmacy and Dentistry of Mali. All participants provided written consent to participate in the survey. No identifying information was collected at any point of the study and data access was limited to investigators.

Results

Sampling

Out of 1,551 coupons distributed, 608 people participated in the study, of which 59 were not eligible. We recruited 552 MSM eligible participants, among whom two did not want to be tested for HIV. Each participant also received three coupons to invite other pairs to considere participation.

Prevalence

HIV prevalence was 13.7% (95% CI: 9.4-18.0) among MSM. MSM had never been tested for HIV before this study was 27%.

Socio-demographic characteristics: The vast majority of MSM were young (83%) from 18 to 29 years, and a predominance of 20-24 years-old (54.3%). The Muslims constituted 88.3% of participants. Most of MSM had a high level of education, those whose never attended school accounted for only 5.2% of the participants. Students accounted for almost half of the sample size (43.3%), followed by sales and service employees (19.5%). Around 36% had earned less than 25,000 FCF (less than 50 US$) in income in the month preceding the survey (Table 1).

Stigma and discrimination: About 2% were rejected by their families because of their sexual orientation. About 15.8% responded that they were blackmailed because of having sex with another man. Also, 23.3% suffered harassment or abuse, 82.9% abuses verbal and 72.6% were made by friends or acquaintances, 15.1% of MSM were forced to have sex (Table 2).

Factors related to the concept of HIV testing: In the bivariate analysis, the factors associated with not being tested for HIV were (27% of the participants): Age of 25-29 years and age of 30 years and more, with respectively OR 1.94 and 95% CI: 1.08-3.49 and OR 2.89 and 95% CI: 1.54-5.37. The main occupation, with OR 1.93 and 95% CI: 1.30-2.89, the non use of alcohol, OR 0.57 and 95% CI: 0.39-0.85, have had sexual assaults, with OR 3.77 and 95% CI: 1.83-7.71, believing that there is no good treatment for HIV (OR: 1.98, 95% CI: 1.33-2.97), the notion of non-awareness of existance of peer educators (OR: 4.48, 95% CI: 2.95-6.82), HIV status (OR: 5.70, 95% CI: 2.26-14.42), were found as associated factors.

In the multivariate model, the following factors were associated with not being tested for HIV: Age greater than or equal to 30 years (OR: 3.15, 95% CI 1.52-6.51), vs. 18-24 years, main occupation (OR: 1.59 and 95% CI: 0.99-2.56), the non-use of alcohol, (OR: 0.62 and 95% CI: 0.40-0.96); history of sexual assault (OR: 3.07 and 95% CI: 1.44-6.54), concept of non-awareness of ex-

Table 1: Sociodemographic characteristics of study participants.

Variables	n	Population %	% (95% CI)
Age			
18-19	71	15.3	12.3, 18.3
20-24	291	54.3	49.5, 59.2
25-29	89	13.4	10.2, 16.5
30-34	36	7.1	0.6, 13.6
> = 35	65	9.9	5.8, 14.1
Nationality			
Malian	535	94.5	93.3, 95.7
Other African nationalities	17	5.5	4.3, 6.7
Religion			
Muslim	487	88.3	85.3, 91.3
Christian	39	8.5	5.9, 11.2
Animist	5	0.2	0, 1.8
No religion	21	3	2.5, 3.4
Highest level of education			
Never attended school	29	5.2	2.1, 8.3
Bambara alphabetization	15	3.4	2.0, 4.8
Primary	138	27.6	21.7, 33.5
Secondary	254	47.3	41, 53.7
University	115	16.4	11, 22.2
Refuse	1	0.2	0, 0
Main occupation			
No work	68	12.7	7.3, 18.2
Student	220	43.3	42.7, 44
Unskilled labor	29	7.0	1.4, 13.0
Professional	8	1.5	0.5, 2.5
Trader/services	115	19.5	8.6, 31.6
Other	100	16.0	7.7, 25.1
Money earned last month			
None	71	17.1	13.6, 20.5
< 25,000 CFA	176	35.9	29.3, 42.5
25,000-49,999 CFA	105	18.7	13.3, 24
50,000-149,999, CFA	103	15.3	10.4, 20.1
150,000-299,999 CFA	63	9.1	5.9, 12.4
More than 300,000 CFA	27	17.1	0, 7.4
Don't know	7	1.3	0.2, 1.8

Table 2: Stigma and discrimination in our study population.

Variables	n	Population%	95% CI
Family's attitude toward respondent's attraction to men			
Accepts respondent	83	12	10, 13.7
Doesn't know about attraction	455	86.3	79.7, 93.1
Rejects respondent	14	1.7	0, 8.5
Thinks it is illegal to have sex with other men in Mali			
Yes, thinks it is illegal	397	72.7	66.9, 78.4
No, thinks it is not illegal	133	22.6	17.3, 27.8
Don't know	22	4.8	1.9, 7.7
Has been blackmailed for having sex with men			

Yes	100	15.8	11.1, 20.5
No	452	84.2	79.6, 88.9
Suffered harassment or abuse for having sex with men			
Yes	149	23.3	17.9, 28.7
No	403	76.7	71.3, 82.1
Type of harassment or abuse received for having sex with men	n = 149		
Physical	59	39.7	26.7, 52.7
Verbal	135	82.9	72.5, 93.2
Moral (isolation, exclusion)	20	17.5	7.6, 27.5
Sexual (forced to have sexual contact)	4	5.3	4.3, 6.2
Other	6	5.6	1.5, 9.8
Has been harassed or abused by	n = 149		
Family members	21	6.2	0, 22.9
Sex partner	16	7	0, 15.2
Friends	108	72.6	60, 85.2
Authority figure (religious leader, employer, teacher)	3	0.1	0, 33.8
Health care worker	1	1.5	0.6, 2.3
Strangers	30	22.6	11.5, 33.6
Prison inmate	1	0	0, 29.5
Other	4	0.8	0, 13.6
Has been forced to have sex against his will			
Yes	96	15.1	10.6, 19.7
No	456	84.9	80.4, 89.4

Table 3: Bivariate and multivariate analysis for concept of no-HIV tested in MSM in Bamako.

Variables	Having tested for HIV in the past vs. not					
	Bivariate			Multivariate		
	OR	(95% CI)	P-value	aOR	(95% CI)	P-value
Socio-demographic characteristics						
Age						
18-24 years	1					**0.00**
25-29 years	1.94	1.08-3.49	0.027	1.27	0.63-2.48	0.479
30 years and more	2.89	1.54-5.37	0.001	3.15	1.52-6.51	**0.002**
Education level						
Never went to school, Alphabetized and	0.769	0,36-1.64	0.499			
Occupation						
Student and Unemployed vs. Worker	1.93	1.30-2.89	0,001	1.59	0.99-2.56	0.057
Marital status						
Married vs. unmarried	1.73	0.82-3.64	0.149			
behavioral characteristics						
Alcohol use						
No vs. yes	0.57	0.39-0.85	0.005	0.62	0.40-0.96	**0.031**
Sexual intercourse against will						
No vs. yes	3.77	1.83-7.71	< 0.001	3.07	1.44-6.54	**0.004**
Being healthy and having HIV						
No vs. yes	1.39	0.86-2.2	0.183			
Thinking there is effective treatment for HIV						
No vs. yes	1.98	1.33-2.97	0.001	1.53	0.98-2.3	0.302
To think HIV messages don't concern me						
No vs. yes	0.77	0.39-1.50	0.433			
Concept of peer educator's sensibilisation						

Variables	Having tested for HIV in the past vs. not					
	Bivariate			Multivariate		
	OR	(95% CI)	P-value	aOR	(95% CI)	P-value
No vs. yes	4.48	2.95-6.82	< 0.001	4.89	3.08-7.75	< **0.001**
Status of HIV infection						
No vs. yes	7.70	2.26-14.41	< 0.001*	3.53	1.34-9.28	**0.011**

istance of peer educators (OR: 4.89 and 95% CI: 3.08, 7.75) (Table 3).

Discussion

This study found that approximately 27% of MSM had never been tested for HIV before this study. This finding is compelling given the prevalence increased to 13.7%. A study in Côte d 'Ivoire found a greater rate than ours with 37.9% (n = 228) of HIV positives having been tested for HIV in the preceding 12 months [2]. In another study in Abidjan, Cote d'Ivoire, 33.8% (n = 203) of MSM had never been tested before study enrollment [26]. Among MSM, 83% of overall participants were under 30, and 63.7% had at least a secondary education level. This could be explained by the large participation of students (43.3% of participants) and that mostly younger MSM, who tend to have less fear of discrimination compared to their older counterparts, maintain a close relationship with NGOs that provide supportive services for MSM.

Since MSM fear stigma, can influence the decision to be tested for HIV or other health needs [27]. Of the 552 MSM enrolled, 39.7% had experienced physical abuse for their sexual orientation. A study conducted in Senegal reveals that 2 out of 5 people (37.9%) reported being the victim of at least once of stigmatization and/or discrimination by other people. The most frequently reported were gossip for 1 on each 3 cases, and verbal and/or physical abuse, 1/5 of MSM [14].

Moreover, several other factors have been associated with not testing for HIV. Age of 30 years and older was associated with not testing for HIV before the study. This shows that relatively older MSM with usually a better social rank and responsibilities are afraid to expose their sexual orientation and therefore, avoid seeking assistance from the NGOs and from the available health facilities in order to be screened. In this study conducted in France in 2009 it was 7.6% for MSM aged 25 or older ($p < 0.0001$) (Léobon, s. d.). The relationship between the not being tested for HIV before study and the use of alcohol was statistically significant, with the non-alcohol users less likely to be screened for HIV. Having had sexual assault, has also been associated with the not being tested for HIV (OR: 3.07). A history of sexual assault in addition to the status of MSM, is reasonably and normally a sufficient reason for this population of being testing for HIV. The lack of contact information of peer educators, as well as the HIV positive status was also associated factors requiring more awareness for screening.

Current knowledge of HIV and the response to the epidemic requires that surveys include awareness of HIV status, antiretroviral treatment (ART) status, and viral load suppression, as mentioned by the UNAIDS 90-90-90 targets [28]. Hence the need to develop strategies to increase HIV testing.

One of the limitations of this study was the cross-sectional design, so the associations in this analysis are exploratory in nature and does not allow us to asses causality. In addition, our sample could be biased toward young MSM, many of whom are students.

Conclusion

It is important to implement all means enabling the MSM in Bamako to go to the screening in regarding the high prevalence (13, 7%) and the percentage of not being tested for HIV 27%. The results provide a reliable and more accurate estimate of the prevalence and the risk factors associated with not being tested for HIV among MSM population in Bamako to adapt the programs to boost the UNAIDS 1st 90 and so the other two.

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Conflict of Interest

None of the authors has a conflict of interest.

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