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HIV testing and associated factors among men who have sex with men in Changsha, China

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Abstract

Promoting HIV testing is an important strategy to end the HIV epidemic. HIV incidence among men who have sex with men (MSM) has increased rapidly in China in recent years, but HIV testing rates are still low. Our cross-sectional study investigated HIV testing rates and analyzed associated factors in 565 MSM in Changsha between April and December 2014. In the previous year 37.7% of participants had not been tested, 38.2% had had 1 test, and 24.1% had had 2 or more tests. Those who initiated sexual debut at an older age, had known someone infected with HIV, or been diagnosed with a sexually transmitted illness (STI) were more likely to have had an HIV test. HIV intervention programs in China should focus on sexually-active young MSM, integrate HIV testing and counseling services in STI clinics, and describe real experiences of living with HIV to improve HIV testing in MSM.

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Keywords

China; HIV testing; men who have sex with men

In China, 738,081 people were living with HIV in 2016 (China Center for Disease Control [CDC] & National Center for AIDS/STD Control and Prevention, 2017a), which accounted for about 15% of the total HIV cases in Asia and the Pacific (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2017). Sexual contact has become the primary route of HIV transmission among adults and adolescents in recent years, and accounted for 94.7% of the new HIV cases in 2016 (China CDC & National Center for AIDS/STD Control and Prevention, 2017b). The proportion of new cases infected through male-to-male sexual contact in China has increased rapidly, from 2.5% in 2006 to 27.6% in 2016 (China CDC & National Center for AIDS/STD Control and Prevention, 2017b; National Center for AIDS/STD Control and Prevention, 2011). Unprotected anal intercourse (UAI) and multiple sexual partners have fueled the HIV epidemic among men who have sex with men (MSM; Zhang et al., 2013).

Although China initiated the “Four Free and One Care” policy in 2003, which provided free antiretroviral therapy (ART), free HIV counseling and screening, free intervention for prevention of mother-to-child transmission, free education for AIDS orphans, and economic assistance to families living with HIV (Ministry of Health, People’s Republic of China, 2012), a significant number of Chinese MSM still do not participate in HIV counseling and testing. A recent meta-analysis showed that less than half of MSM had ever tested for HIV and only 38% had tested in the past 12 months (Zou, Hu, Xin, & Beck, 2012). Late testing and late access to treatment remain a main cause of HIV-related deaths globally (Valdiserri, 2007). Improving HIV testing, particularly in key populations with high HIV prevalence, is the first step to achieve the “90-90-90” goal set by the Joint United Nations Programme on HIV/AIDS (90% of people with HIV know their status, 90% are linked to ART, and 90% are virally suppressed; UNAIDS, 2014), and will reduce the likelihood of transmitting HIV to others. Therefore, better understanding of the precursors of HIV testing behavior will help researchers and public health services develop targeted strategies to improve HIV testing among MSM in China.

Literature Review

The HIV prevalence among MSM in China was around 8% in 2015 (China CDC & National Center for AIDS/STD Control and Prevention, 2016), but it was greater than 10% in regions such as Chongqing, Nanjing, Hangzhou, Ningbo, and Wenzhou in recent years (Huang et al., 2014; R. Li et al., 2016; Yan et al., 2016). However, the HIV testing rate has been low for Chinese MSM. The proportion of HIV-infected, but unaware, MSM was 25% in the United States in 2015 (CDC, 2016) and 60% in Europe (Ferrer et al., 2015); in China it was 86.1% (Li et al., 2012). The U.S. CDC found that MSM who were unaware of their HIV status were more than twice as likely to engage in UAI, compared to MSM who were aware of their infection; the CDC has recommended at least one HIV test per year for all MSM, and two to four HIV tests per year if at high risk (CDC, 2013). China has the same

recommendation for HIV testing in MSM (China CDC & National Center for AIDS/STD Control and Prevention, 2016). The Chinese government and gay-friendly community-based organizations (CBO) have taken actions to promote HIV testing by MSM, such as the Pilot Program for HIV/AIDS Comprehensive Intervention Among MSM, peer education and free HIV voluntary counseling and testing provided by CBOs, and the China HIV/AIDS Containment, Prevention, and Control Action Plan (China CDC, 2008; China General Office of the State Council, 2017; Ministry of Health Peoples Republic of China, 2012; Zou et al., 2012). These efforts have been effective, but more remains to be done. A meta-analysis showed that the proportion of MSM who reported ever having had an HIV test was 24% during the period of 2000–2007 and increased to 47% during the period of 2008–2011 (Zou et al., 2012), but this was still far from the “90-90-90” target proposed for 2020.

Although several studies have identified factors related to HIV testing among MSM in developed countries, the factors associated with HIV testing in Chinese MSM have not been thoroughly assessed. A synthesis of qualitative research showed that in developed countries, the appearance of symptoms, having engaged in UAI, or having a friend or partner infected with HIV could facilitate HIV test uptake; while low self-perceived risk of HIV acquisition, inconvenient clinic time/location, lack of knowledge, and social stigma and discrimination were barriers for MSM seeking HIV tests (Lui et al., 2017). Some studies have assessed the associated factors of HIV testing among MSM in eastern and southern China (R. Li et al., 2016; Li et al., 2017; Yan et al., 2016). For example, in Hangzhou (Li et al., 2017), recent HIV testing was associated with age of homosexual debut, engaging in UAI, self-perceived risk of HIV infection, and knowing about ART for HIV treatment. Little information was available about the factors associated with HIV testing in south central China, which had a rapidly developing HIV epidemic among MSM, with a more than 10% HIV prevalence seen in preliminary studies in Changsha, Hunan Province (Lei, Wang, Xiao, Chen, & Li, 2016). The number of people living with HIV (PLWH) in Hunan Province is expected to exceed 44,000 in 2020 with a substantial increase in cases among MSM (Ma et al., 2012).

Our paper includes data from a cross-sectional study that described HIV testing rates and explored factors associated with testing among MSM in Changsha, Hunan Province, China, in order to help develop strategic interventions to improve HIV testing for Chinese MSM.

Methods

Design

A cross-sectional survey was carried out with MSM in Changsha, Hunan Province of China from April to December 2014.

Setting and Participants

Changsha is the capital city of Hunan Province, with an area of 11,819 km² and a population of approximately 7.352 million. A local gay friendly CBO located in the downtown area of Changsha served as the study setting. This CBO was founded in 2008 and had seven locations in Hunan Province. It provided HIV testing and counseling for about 70% of MSM in the Changsha area. It has collaborated with several research teams from Central South

University as well as with the Changsha CDC; all staff and volunteers who participated in this study had been trained on research ethics. Flyer advertising and snowball sampling methods were adopted for participant recruitment. Study flyers were posted in the voluntary counseling and testing centers of the CBO and Changsha CDC, as well as on social media programs (QQ and WeChat). The inclusion criteria for participation were (a) being male, (b) being at least 18 years of age, (c) having resided in Changsha for at least 6 months, (d) having had unprotected sex with men in the past year (self-reported), and (e) being able to provide consent to participate in the study. Those who (a) had received an HIV diagnosis before this study, (b) were severely ill, or (c) were participating in other intervention studies, were excluded. In total, 615 participants were recruited between April and December 2014.

Data Collection Procedure

Interested MSM contacted research assistants for assessment of eligibility, which was determined by a brief screening interview. After providing written informed consent, eligible participants were interviewed face-to-face by researchers, who had been trained in interviewing procedures and techniques. After the interview, all consented participants were provided with free rapid testing for HIV, syphilis, and hepatitis C virus (HCV). Individuals who tested positive for HIV were referred to Changsha CDC for confirmatory testing and were engaged in ART, if appropriate. Test results were linked to the questionnaires using a unique identification code and without any personal identifiers. All participants received a package of condoms and lubricant (value = \$7 USD) for their time and compensation for local transportation costs.

Measurement

The survey instrument was developed based on the existing literature and experiences of community members who advised the research team. The following variables were included: demographic information (age, marital status, education, occupation, place of residence, monthly income, sexual orientation; 7 items); knowing someone infected with HIV (1 item); sexual behaviors (30 items); sexually transmitted illness (STI) diagnosis (including syphilis, gonorrhea, condyloma acuminata, genital herpes, Chlamydial trachomatis, phthiriasis pubis) in the previous year (2 items), and self-reported HIV testing history in the previous year (response items: *never tested*, *tested once*, *tested twice*, *tested 3 times*, *tested 4 times*, or *tested more than 4 times*; 1 item).

Sexual behaviors were measured using a 30-item questionnaire that had been used in a study of MSM in Changsha in 2012 (Chen et al., 2016). Variables included anal and oral sexual practices and condom use frequencies with male partners (*lifetime* and *current*), commercial sexual behaviors (*buying or selling sex*), sexual practices and condom use frequencies with female partners (*lifetime* and *current*); sexual roles (*top*, *bottom*, or *both*), and number of lifetime sexual partners.

Data Analysis

Participants who answered the question of “HIV testing history in the past year” were included in the final analysis ($n = 565$; 91.9%). All study variables were double-checked for missing data, outliers, and suspected errors. The relationship between demographic

information, knowing someone infected with HIV, sexual behaviors, STI experiences, and self-reported HIV testing history were examined by Wilcoxon rank sum test, chi-square test, and analysis of variance, which were conducted with the Statistical Package for the Social Sciences 18.0 (SPSS, Inc., Chicago), with statistical significance defined as $p < .05$. The distributions of continuous variables were described using means and standard deviations, and categorical variables were described using frequencies and percentages.

The primary outcome of HIV testing behavior was transformed into a binary variable as *never tested in the last year* and *ever tested in the last year*. A logistic regression analysis was performed to examine factors independently associated with recent HIV testing. All significant variables in the bivariate analysis were included in the regression model. Adjusted odds ratios were calculated and presented with 95% confidence intervals.

Ethical Considerations

The study was reviewed and approved by the Institutional Review Board of Xiangya Nursing School of Central South University. Written informed consent was obtained prior to initiating the structured face-to-face anonymous interviews in a private room of the CBO.

Results

Demographic Characteristics

Of the 565 MSM in the study, the mean age was 28 years, with a range of 18 to 68 years. Most were Han nationality (95.9%), single (83.9%), highly educated (80%), and stably employed (50.8%). Roughly one third (31%) had a monthly income of more than 4,000 RMB (\$588.50 USD). Nearly two thirds (62.8%) of the participants self-identified as homosexual, 21.1% self-identified as bisexual, and 7.8% self-identified as heterosexual. Only 15.2% of the homosexual participants had disclosed their sexual orientation to their parents; of those, only 4.7% reported that their parents were emotionally supportive. One third (38.6%) of the participants knew someone with HIV infection (Table 1).

Sexual Behavior

The mean age at first sexual intercourse (including oral, anal, and vaginal sex) was 21 years, with a range from 8 to 45 years. Nearly all of the participants (94%) reported having had at least two lifetime male sexual partners. Eighty-six percent of the participants reported having had anal sex with another male in the past 6 months; among them, less than half (45.6%) reported consistently using condoms, and about one third (25.9%) reported engaging in UAI during the latest anal intercourse. Some (14.9%) had had sex with a female partner in the past 6 months; of those, only 33.3% used condoms consistently.

HIV Testing Experience

Before participating in our study, 37.7% of the participants had never received an HIV test, 38.2% reported having one test, 16.6% reported having 2 tests, 4.6% reported having 3 tests, 1.8% reported having 4 tests, and 1.1% reported having more than 4 tests during the past year.

STI Experience and Serologic Testing Results

A small percentage (8.7%) of the participants self-reported having had at least one type of STI in the previous year, including gonorrhea (8.2%), syphilis (32.7%), condyloma acuminata (30.61%), phthiriasis pubis (5.1%), and genital herpes (4.1%).

After filling out the survey, all participants were tested for HIV, syphilis, and HCV. The results showed that 12.4% (70/565) were infected with HIV, 7.1% (40/565) were infected with syphilis, 0.4% (2/565) of participants were infected with HCV, 3.2% (18/565) were co-infected with HIV and syphilis, and 0.18% (1/565) was co-infected with HIV and HCV.

Factors Associated With HIV Testing

Bivariate analysis showed that factors associated with HIV testing in the past year included age, occupation, monthly income, knowing someone infected with HIV, age of first sexual intercourse, number of lifetime male sexual partners, and the diagnosis of STI in the past year (Table 1).

All variables that were statistically significant in the bivariate analysis were included in a multivariable logistic regression model. The final regression model is presented in Table 2. Those who knew someone infected with HIV (OR: 1.91, 95% CI: 1.23–2.98, $p = .004$), initiated sex at an older age (OR: 1.57, 95% CI: 1.17–2.12, $p = .003$), or had been infected with at least one type of STI (OR: 2.45, 95% CI: 1.18–5.11, $p = .017$) were more likely to have had at least one HIV test during the previous year (Table 2).

Discussion

HIV testing is an essential process in identifying PLWH, engaging them in the HIV care continuum, and preventing HIV transmission from high-risk populations to the general population. Globally, it is recommended that MSM have at least one HIV test each year (CDC, 2013), but the HIV testing rate worldwide is low. The annual HIV testing rate for MSM was 71% in the United States in 2014 (CDC, 2016), 43.1% in Sweden in 2013 (Persson et al., 2016), and 38% in Germany in 2013 (Marcus, Gassowski, Kruspe, & Drewes, 2015). Late detection has been associated with higher risk of morbidity and mortality, reduced effectiveness of treatment, and increased risk of transmission (Anglaret et al., 2012; Skarbinski et al., 2015). The rates of AIDS or death were higher in patients with CD4+ T cell counts of 0–49 cells/ μ L (99.9 events per 100 person-years) than in patients with CD4+ T cell counts greater than or equal to 650 cells/ μ L (0.9 events per 100 person-years; Anglaret et al., 2012). Our study's unique contribution to the literature lies in its identification of factors associated with HIV testing and predictors for non-uptake of HIV testing among Chinese MSM.

Our study showed that the HIV testing rate during the previous year for MSM in Changsha was 62.3%, which was slightly higher than the rates reported in studies from other areas of China. For example, the HIV testing rate was 46.0% in Nanjing in 2012 (Yan et al., 2016) and 56.8% in Hangzhou in 2014 (Li et al., 2017); however, HIV testing remains far below the UNAIDS target goal of 90% by 2020 (UNAIDS, 2014). The reasons for the relatively high HIV testing rate in our study could be related to (a) the study CBO has been

collaborating with Changsha CDC to provide outreach interventions to promote HIV testing in recent years in the Changsha area, which might have made testing more acceptable or desirable to MSM in this area; and (b) this was a cross-sectional study, and we recruited participants from the CBO-based HIV testing center. Therefore, only those who had a willingness to test had the opportunity to participate in the study and, thus, selection bias might have existed.

Consistent with findings in other studies (Reisen et al., 2014; Zhao et al., 2015), those who knew someone infected with HIV were more likely to have had an HIV test. Knowing someone infected with HIV could increase one's risk perception of HIV acquisition (Zhao et al., 2015) or raise the awareness of HIV severity (Reisen et al., 2014), and these factors might facilitate the uptake of HIV testing. Previous qualitative evidence has indicated that the typical thinking error was "it (HIV infection) can't be me" (Li, Lei, Wang, He, & Williams, 2016). A randomized controlled trial conducted in Nanjing demonstrated that enhanced counseling with a video narrated by MSM living with HIV reduced the prevalence of UAI among MSM (Hao et al., 2012). Another study also provided evidence that communicating with PLWH was a significant source of support for MSM (Wei et al., 2014). Therefore, interventions to improve HIV testing uptake could target exposure to the real experiences of living with HIV in the community, and let participants know that they are not isolated from PLWH.

Our results also showed that those MSM who initiated sex at an older age were more likely to have had an HIV test than those who initiated sex at a younger age. Similarly, a recent study conducted in Hangzhou revealed that younger age at first anal sex experience was associated with less likelihood of HIV testing (Li et al., 2017). It is possible that younger MSM had more worries about positive test results (Nel, Yi, Sandfort, & Rich, 2013), or lower risk perception (R. Li et al., 2016). Worldwide, about 37% of new HIV infections among adults have occurred in youth ages 15 to 24 years, and the awareness of HIV prevention knowledge among them varied extremely by region, from 2.7% to 85.7% (UNAIDS, 2017). Therefore, it is important to develop an integrated sex education system to promote safe sex for youth, and to encourage young MSM to have regular HIV testing after their first sexual intercourse. Moreover, knowing the average age of the first sexual intercourse among MSM will allow HIV prevention programs to target the appropriate population for HIV prevention interventions.

Globally, MSM are disproportionately affected by HIV and other STIs (Fu et al., 2015; Katz, Dombrowski, Bell, Kerani, & Golden, 2016; Remis et al., 2016). In our study, the prevalence of HIV and syphilis were 12.3% and 7.1%, respectively, which were higher than the rates in Nanjing in 2012 (10.1% and 9.9%; Yan et al., 2016) and lower than the rates in Zhejiang province in 2014 (14.0% and 11.4%; R. Li et al., 2016). Compared to MSM who had never been diagnosed with an STI, those who had been diagnosed with an STI in the past year were 2.4 times more likely to have had at least one HIV test in the previous year. A diagnosis of an STI seemed to play a key role in MSM decisions to get tested for HIV. The significant knowledge they gained might be that the STI could increase their susceptibility to HIV infection, which may have reinforced their HIV risk perception (Brown et al., 2012; Chin-Hong et al., 2009). However, the association of STI diagnosis and HIV testing uptake

might also have been due to recommendations from physicians working in STI clinics (R. Li et al., 2016; Li et al., 2017). This highlights the importance of integrating STI and HIV screening and preventive interventions together in STI clinics, so those who are diagnosed with an STI can be given more intensive HIV prevention interventions.

Surprisingly, our study did not show any significant relationships between UAI and HIV testing rates, and 86.9% of the participants who never tested for HIV had had anal sex with a male partner in the past 6 months; among them, 33.3% engaged in UAI the last time they had anal sex. However, prior studies have demonstrated inconsistent results about the relationship between UAI and HIV testing rates. Some studies have shown that MSM who had UAI were more likely to have HIV testing (Holt et al., 2012; Li et al., 2017; Persson et al., 2016), whereas, a study conducted in Chongqing revealed that MSM who used condoms during anal sex were more likely to test for HIV (Li et al., 2014). Future studies are needed to clarify the association between UAI and HIV testing.

There were several limitations to our study. First, this cross-sectional study was unable to verify participant self-reported testing behaviors, and some questions in our survey involved a 6-month recall period. Thus, recall bias might have existed. Second, this was not a representative sample of MSM in Changsha, because only those who had a willingness and came to the CBO for testing could be recruited into the study. Third, not all assessment instruments were empirically validated. While this was a limitation, we prioritized the use of measures that had been used in either Changsha or elsewhere in China, as they were known to be acceptable to our participants and would allow for comparisons to other local and national data. Fourth, our study did not consider certain variables known to be associated with HIV testing, such as social stigma and social support. Psychosocial variables should be explored and integrated into future studies. Finally, our data were collected in 2014 and may not reflect the current situation in China. We searched the databases including PubMed, Web of Science, CNKI, and Wanfang Database and found the latest report of HIV testing rates in the previous year in Chinese MSM was 50% in 2016 (Kwan & Lee, 2018), which was lower than that in our study. Thus, the implication of our study remains significant for current and future HIV prevention and intervention practice.

Conclusion

HIV infection, although prevalent in MSM in Changsha, has not been matched with an equally high HIV testing rate. Several factors that predict recent HIV testing behavior among MSM in our study have been identified, including knowing someone infected with HIV, older age at first sexual intercourse, and at least one STI diagnosis in the previous year. Future intervention programs aiming to improve HIV testing should focus on young MSM who are sexually active, integrate HIV testing and counseling services in STI clinics, and describe real experiences of living with HIV, so as to increase HIV testing by MSM in China.

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Key Considerations

- The HIV testing rate in MSM remains far below the UNAIDS target goal of 90% by 2020 in Changsha, China.
- There is an urgent need for comprehensive sex education in public school to promote risk perception about HIV and increase HIV prevention knowledge in young Chinese MSM.
- HIV testing and counseling services should be integrated in STI clinics to increase HIV testing coverage in Chinese MSM.

Table 1

Characteristics of MSM and Bi-Variate Analysis of Factors Associated With HIV Testing in the Previous Year Among MSM in Changsha (N = 565)

Items	Total n (%)	Never test n (%)	Ever test n (%)	p-value
Age (years)				.03
18–27	309 (54.7)	130 (61.0)	179 (50.9)	
28–37	210 (37.2)	66 (31.0)	144 (40.9)	
38	46 (8.1)	17 (8.0)	29 (8.2)	
Ethnicity				.24
Han	542 (95.9)	207 (97.2)	335 (95.2)	
Minority	23 (4.1)	6 (2.8)	17 (4.8)	
Marital status				.08
Single	474 (83.9)	186 (87.3)	288 (81.8)	
Married	91 (16.1)	27 (12.7)	64 (18.2)	
Education				.33
Junior high school or less	27 (4.8)	11 (5.2)	16 (4.5)	
High school	86 (15.2)	32 (15.0)	54 (15.3)	
Undergraduate	416 (73.6)	162 (76.1)	254 (72.2)	
College graduate or higher	36 (6.4)	8 (3.8)	28 (8.0)	
Occupation				.04
Business/service industry practitioner	173 (30.6)	58 (27.2)	115 (32.7)	
Government officer/technician	114 (20.2)	37 (17.4)	77 (21.9)	
Student	116 (20.5)	58 (26.3)	60 (17.0)	
Other	162 (28.7)	62 (29.1)	100 (28.4)	
Monthly income (USD)				.003
None	104 (18.4)	52 (24.4)	54 (14.8)	
146.32	5 (0.9)	2 (0.9)	3 (0.9)	
146.32–292.63	40 (7.1)	13 (6.1)	27 (7.7)	
292.63–438.95	121 (21.4)	53 (24.9)	68 (19.3)	
438.95–585.27	120 (21.2)	36 (16.9)	84 (23.9)	
> 585.27	175 (31.0)	57 (26.8)	118 (33.5)	
Sexual orientation				.25
Homosexual	355 (62.8)	124 (58.2)	231 (65.6)	
Bisexual	119 (21.1)	47 (22.1)	72 (20.5)	
Heterosexual	44 (7.8)	20 (9.4)	24 (6.8)	
Not sure	47 (8.3)	22 (10.3)	25 (7.1)	
Knows someone infected with HIV				.001
Yes	218 (38.6)	61 (28.6)	157 (44.6)	
No	189 (33.5)	83 (39.0)	106 (30.1)	
Not sure	158 (27.9)	69 (32.4)	89 (25.3)	
Age at first sexual intercourse				.001
18	155 (27.4)	74 (34.7)	81 (23.0)	

Items	Total n (%)	Never test n (%)	Ever test n (%)	p-value
19–24	333 (58.9)	118 (55.4)	215 (61.1)	
25	77 (13.6)	21 (9.9)	56 (15.9)	
Sexual role				.54
Top	154 (27.3)	56 (26.3)	98 (27.8)	
Bottom	86 (15.2)	37 (17.4)	49 (13.9)	
Both	325 (57.5)	120 (56.3)	205 (58.2)	
Had anal sex with male partner during past 6 months				.87
Yes	489 (86.5)	185 (86.9)	304 (86.4)	
No	76 (13.5)	28 (13.1)	48 (13.6)	
Number of lifetime male sexual partners				.04
1	34 (6.0)	16 (7.5)	18 (5.1)	
2–5	222 (39.3)	92 (43.2)	130 (36.9)	
6	309 (54.7)	105 (49.3)	204 (58.0)	
Had sex with female partner during past 6 months				.75
Yes	84 (14.9)	33 (15.5)	51 (14.5)	
No	481 (85.1)	180 (84.5)	301 (85.5)	
Number of lifetime female sexual partners				.18
1	123 (21.8)	41 (19.2)	83 (23.3)	
2–5	87 (15.4)	31 (14.6)	56 (15.9)	
6	355 (62.8)	141 (66.2)	214 (60.8)	
Diagnosed with at least one type of STI				.009
Yes	49 (8.7)	10 (4.7)	39 (11.1)	
No	516 (91.3)	203 (95.3)	313 (88.9)	

Note. STI = sexually transmitted illness; USD = U.S. dollar.

Table 2

Factors Associated With HIV Testing Among Participants in the Past Year in Changsha

Items	B	OR (95% CI)
Knowing someone infected with HIV		
Not sure	Reference	—
Yes	0.649	1.91 (1.23–2.98) **
No	0.060	1.06 (0.69–1.64)
Age at first sexual intercourse	0.452	1.57 (1.17–2.12) **
Diagnosed with at least one type of STI	0.896	2.45 (1.18–5.11) *

Note.

*
 $p < .05$,**
 $p < .01$;

OR = odds ratio; CI = confidence interval; STI = sexually transmitted illness.