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Prevalence of condomless anal intercourse and associated risk factors among men who have sex with men in Bamako, Mali

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Abstract

Background: Men who have sex with men (MSM) are disparately impacted by HIV in sub-Saharan Africa and condomless anal intercourse (CAI) is a major driver of HIV transmission. The objective of the current study was to identify factors associated with CAI among MSM in Bamako, Mali, among whom HIV prevalence was 13.7%.

Methods: A bio-behavioral survey was conducted between October 2014 and February 2015 using respondent-driven sampling to recruit 552 adult MSM. Weighted statistical analyses were conducted to determine the prevalence of CAI with one's most recent male partner and survey logistic procedures were used to identify associated factors.

Results: The prevalence of CAI with one's most recent male partner was 40.7%. Associated factors included: inability to get a condom when needed (aOR = 5.8, 95%CI: 2.7–12.3) and believing CAI is acceptable under some circumstances (aOR = 8.4, 95%CI: 4.4–16.2).

Conclusions: Programs addressing HIV among MSM in Mali should aim to increase access to condoms and education about HIV prevention through consistent condom use during anal intercourse.

Keywords

HIV; MSM; unprotected anal intercourse; risk; Africa

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Introduction

Men who have sex with men (MSM) in sub-Saharan Africa are disparately impacted by HIV.[1] Social stigma, criminalization of homosexuality, and MSM-related policies that are either restrictive or absent have created a climate in which MSM populations have remained hidden, thus heightening the risk of acquiring and transmitting HIV to other MSM.[2] These factors have also limited the feasibility of conducting research on MSM in sub-Saharan Africa.[3] Recently, research on MSM has achieved some momentum in sub-Saharan Africa countries, and found high prevalence of HIV, with levels ranging from 4% to 50%.[4–8] A systematic review estimated the overall prevalence of HIV among MSM in sub-Saharan Africa to be 18%.[2] Evidence also suggests that HIV incidence is now increasing among MSM in many low-income settings.[9] The heightened risk among MSM of acquiring and transmitting HIV is largely driven by unprotected anal intercourse (UAI), which is one of the most efficient modes of HIV transmission.[10,11] Therefore, research is urgently needed to estimate the prevalence of UAI and its associated risk factors in diverse samples of MSM in sub-Saharan Africa. As UAI is an important modifiable proximal determinant of HIV transmission, a better understanding of factors associated with UAI can inform interventions to reduce HIV acquisition and transmission.

UAI has been found to be common among MSM in various West African countries, with variation in associated risk factors. An integrated bio-behavioral survey (IBBS) that used respondent-driven sampling (RDS) in Cote d'Ivoire found that 65% of MSM reported UAI, defined as not consistently using condoms during anal sex with men in the preceding 12 months.[12] In other studies on UAI in West Africa, all of which used convenience sampling or snowball sampling, the prevalence of UAI varied. In Nigeria, prevalence of UAI, defined as not using condoms at last sex with a male partner, was 37% in one study,[13] and 43% in another.[14] In Cameroon, prevalence of UAI, defined as UAI with a male partner in the last six months (among those who reported having anal sexual intercourse with a male partner during that period (85% of the sample)), was 57%.[15] In the Gambia, prevalence of UAI, defined as not always using condoms with all male sexual partners (recall period not specified), was 91%.[16] Factors associated with UAI included a history of forced sex, alcohol consumption, having a regular partner and a casual partner, having bought sex, and self-perception of low HIV risk.[17] In another study, prior HIV testing and knowledge of at least one sexually transmitted infection that can be transmitted through UAI was found to be protective against UAI.[13] Thus far, the associated risk factors of UAI among MSM in Mali has not been reported; therefore, there is a need for exploratory studies in this area.

In a recent IBBS, MSM in Bamako, Mali were found to have an HIV prevalence of 13.7%,[4] which is more than eight-fold higher than the prevalence in the general population of adult men in the city (1.6%).[18] This underscores the urgent need for a better understanding of what contributes to HIV risk among this key population. The current analysis seeks to address this need by using data from the same IBBS to estimate the prevalence of condomless anal intercourse (CAI) among MSM in Bamako, Mali and identify its associated risk factors. Given the limited knowledge of CAI and its risk factors in this setting, the nature of the current study is exploratory.

Methods

Participants

A cross-sectional IBBS was conducted among MSM in Bamako, Mali between October 2014 and February 2015, and has been previously described.[4] MSM were sampled using RDS, a widely used method for sampling populations when a sampling frame is not available.[19,20] RDS involves getting a convenience sample of "seeds" (initial survey participants) to refer other individuals that they know to participate in a study, and then those individuals in turn refer others those they know, and so on. This approach is then combined with a mathematical model that weights the sample to compensate for the fact that the sample was collected in a nonrandom way.[19,20] Formative assessment revealed that MSM are connected through social networks, but lack public places to socialize, suggesting that RDS could be a productive sampling method.[21] Six "seeds", were selected purposively based on age, marital status, profession, gender identity, location of residence, and level of engagement with partnering nongovernmental organizations. After participating in the survey, the seeds were each given three coupons to recruit members from their networks. Subsequent participants were also each given three coupons to recruit peers. Coupons included tracking numbers to link participants to their recruiters. Midway through the survey, an additional seed ≥30 years was added in an effort to reach networks of MSM age ≥30 years.

Procedures

Potential participants were required to submit a valid coupon before being screened for eligibility. Eligibility criteria included: (1) being ≥18 years of age; (2) residing in Bamako or its suburbs in the preceding six months; (3) speaking French or Bambara; (4) having had oral or anal sex with another man in the preceding six months. Eligible participants who provided informed consented then underwent a face-to-face interview conducted in French or Bambara using handheld electronic tablets. Personal identifiers were not collected. The survey questionnaire was based on a standardized tool developed by the US Centers for Disease Control and Prevention (CDC), and used in other international surveys of HIV in MSM.[12,22] After the interview, participants were counseled and tested for HIV according to the national HIV testing algorithm, which included Determine, Clearview (confirmatory), and Oraquick (tie-breaker). All seropositive samples and 10% of sero-negative samples were sent to Mali's National Institute for Public Health Research (Institut National de Recherche en Santé Publique) for quality control. Participants who tested positive for HIV infection were referred to health clinics where at least one staff member had participated in a pre-survey training that included an orientation to the survey, training on providing stigma-free care and treatment to HIV-positive MSM, and instructions on documenting referrals from the survey.

This project was approved by ethical review boards of the Centers for Disease Control and Prevention, the Columbia University Medical Center, and the University of Bamako Faculty of Medicine and Odontostomatology. All participants provided written informed consent prior to participating in the study.

Measures

Data were collected on background characteristics, sexual identity, psychosocial factors, sexual behaviors, condom use/accessibility, access to health services, and HIV knowledge, according to World Health Organization (WHO) Biobehavioural Survey Guidelines For Populations At Risk For HIV.[23] These were developed by the Global HIV Strategic Information Working Group, which includes representatives from WHO, CDC, UNAIDS, FHI 360. The instruments have all been field tested and, whenever available, use validated questions and scoring methods.[24,25] All behaviors were asked about during the preceding six months unless otherwise specified. Variables explored for association with CAI were selected based on conceptual understanding of risk for CAI and from findings in previous studies. For example, proximal behavioral determinants related to condom use (e.g. sexual behaviors, condom use/accessibility) were selected.[26,27] Also as example, characteristics of sexual identity have been shown to be associated with sexual risk behavior among African MSM, as have psychosocial factors, substance use, and other HIV-related behaviors.[13,17,28–41] Specific variables explored include: background characteristics: age, education, marital status, occupation, income, nationality, religion; sexual identity: gender identity, sexual identity; sexual attraction; psychosocial factors: alcohol use, noninjectable drug use, symptoms of depression; sexual behaviors: age at first sex with another male, number of male sexual partners (categorized as 1, 2, and 3+), sexual role with most recent male partner, relationship with most recent male partner, concurrent sexual activity with most recent male partner (replied affirmatively to the items: when you were having a sexual relationship with this person did you have sex with other people? and/or, as far as you know, did this person have sex with other people?), transactional sex (ever), sex with a woman (ever), experienced forced sex (ever), sexually transmitted infection symptoms (past year), tested for HIV (past year), knows other MSM living with HIV; condom use/accessibility: had a condom break during anal sex, did not use free condoms when they had them; access to health services: exposed to condom outreach, unable to get condoms when needed; HIV knowledge: believes condom use reduces risk of HIV infection, believes CAI is acceptable under some circumstances. Alcohol use was measured using the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C),[42,43] a scale developed and validated by the WHO for international use, including in Africa,[42–44] where it has been used in multiple studies.[45–47] The AUDIT-C uses three items: how often the respondent drinks, how many drinks the respondent consumes in a typical day of drinking, and how frequently the respondent drinks six or more drinks at a time. Of a maximum score of 12 on the AUDIT-C, a score of four or more has been used to indicate hazardous drinking for men.[48] Noninjectable drug use was measured by asking men if they had ever used marijuana, poppers, cocaine, opiates, hallucinogens, amphetamines, and other club drugs. The outcome, CAI, was defined as having had unprotected sex (insertive, receptive, or both) with one's most recent male partner.

Statistical analyses

Weights adjusted for RDS recruitment methods were calculated in RDSAT (www.respondentdrivensampling.org) and imported into SAS version 9.3, which was used to generate population estimates from the bivariate and multivariate models. Survey logistic procedures using the weights imported from RDSAT were used to identify factors associated

with CAI in bivariate and multivariable analyses and estimate odds ratios (OR) and adjusted OR (aOR) with 95% confidence intervals (CI). Missing data were infrequent (no variable had as much as 1.5% missing) and considered missing at random; participants with missing data were excluded listwise on relevant statistical procedures. All multivariable models included age and education as covariates, as well as any other variables that were significantly associated with CAI at the $p<0.1$ level in bivariate analyses. Variables independently associated with CAI at the $p<0.05$ level were retained in the final multivariate model using a backwards stepwise approach.

In sensitivity analyses, to account for the increased probability of making false statistical inferences as a result of testing multiple comparisons, a Bonferroni correction was applied to account for the 29 variables assessed against CAI.[49,50] In those analyses, only variables independently associated with CAI at the $p<0.0017$ ($p<0.05/29$) level were retained in a multivariate model using a backwards stepwise approach, and the results are reported separately.

Results

Sociodemographic characteristics

A total of 552 MSM enrolled in the survey. Table 1 presents sociodemographic characteristics of the sample. The majority (69.6%) of MSM were <25 years old; only 11% were ≥30 years old. Most (63.7%) MSM had at least a secondary education. Many (43.3%) MSM were students, and 22.0% were professionals. Most MSM were never married (91.8%), Malian (94.5%) and Muslim (88.3%). In terms of gender and sexuality, most MSM self-identified as male (72.4%), and reported only being sexually attracted to men (75.1%). Similar proportions of MSM self-identified as gay (45.2%) and bisexual (54.8%), with only a small proportion as straight (1.1%). The following variables had missing data: highest level of education (0.2%) and marital status (0.9%).

Psychosocial factors, sexual behavior, and condom-related characteristics

Table 2 presents psychosocial factors, sexual behavior, and condom-related characteristics of the sample. Nearly a fifth (18.8%) screened positive on the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C). A small proportion (4.2%) reported recreational use of noninjection drugs. Nearly a third (29.8%) reported symptoms of depression. More than half (53.7%) had multiple sex partners in the past six months: 22.9% had two partners and 30.8% had three or more partners. More than half (57.2%) reported being only the insertive partner with their most recent male sex partner, while (24.6%) reported being only the receptive partner, and 18.2% reported being both the insertive and receptive partner. More than half (60.6%) reported concurrent sexual activity with their last male partner. Some (11.8%) MSM did not correctly answer that condom use reduces risk of HIV infection. and 35.0% believed CAI is acceptable under at least one of the following circumstances, which included: when having sex with a regular partner (29.8%), when afraid to ask for condom use or when one’s partner refuses to use a condom (6.1%), when under the influence of alcohol or drugs (3.0%), if withdrawal occurs prior to ejaculation (0.5%), when having sex with a nonregular partner (4.8%), and when being the receptive

partner (1.5%). Some (27.8%) MSM reported that they were unable to obtain condoms when they needed them, with commonly reported reasons being that the place where condoms were available was either too far or closed. A substantial proportion (40.7%) of MSM had CAI with their most recent male sexual partner, either as the receptive partner, insertive partner, or both. The following variables had missing data: age at first sex with another male (1.3%), number of male sexual partners (0.2%), sexual role with most recent partner (1.4%), relationship to most recent male sex partner (0.2%), endorsing the belief that condom use reduces risk of HIV infection (0.4%), and reporting being unable to get condoms when needed (0.2%).

CAI and associated factors

Table 3 presents multivariable associations between selected variables and CAI. Religion (p=0.049), having had a condom break during anal sex (p=0.006), and having tested for HIV in the past year (p=0.038) were independently associated with CAI in unadjusted analyses but not in adjusted analyses. Factors independently associated with CAI in adjusted analyses were, in decreasing order of strength: believing CAI is acceptable under some circumstances (aOR=8.4, 95%CI: 4.4–16.2); inability to get a condom when one was needed (aOR 5.8, 95%CI: 2.7–12.3); having been both the insertive and receptive partner with one's most recent partner (OR=3.5, 95% CI: 1.4–9.0); having two sex partners in the past six months (aOR 3.0, 95%CI: 1.3–6.6); and knowing another MSM who is HIV-positive (OR=3.1, 95% CI: 1.3–7.3).

In sensitivity analyses that accounted for multiple comparisons using Bonferonni corrections,[49,50] factors independently associated with CAI in adjusted analyses were: believing CAI is acceptable under some circumstances (aOR=5.6, 95%CI: 3.0–10.5) and inability to get a condom when one was needed (aOR 4.8, 95%CI: 2.4–9.5).

Discussion

In the current study, we found that CAI was common among MSM in Bamako, Mali. About 40.7% of MSM engaged in CAI with their most recent male sexual partner. In the context of an HIV prevalence of 13.7% among MSM in Bamako,[4] this high prevalence of CAI is concerning. In addition to the high level of CAI, many men responded incorrectly to knowledge items about the preventive effects of condom use and HIV transmission, reported an inability to access condoms, and held beliefs supporting inconsistent condom use. There are limited HIV prevention programs specifically for MSM in Mali, which might help explain some of these findings.

Many of these factors were also associated with HIV risk behavior. For example, men who were unable to get a condom when needed were more likely to engage in CAI than those who were, as were men who believed that CAI is acceptable under some circumstances than those who did not. Furthermore, men who reported exactly two sexual partners in the preceding six months were more likely to engage in CAI than those with only one partner, as were men that have been both the insertive and receptive partner than those who reported sexual role exclusivity. Again, these findings are concerning in the context of elevated HIV prevalence and low levels of viral suppression among MSM, such as in Mali,[51] as these

behaviors are likely to contribute to further HIV transmission. These findings also all further speak to the need for additional resources and tailored HIV prevention efforts for MSM in Bamako, Mali.

Knowing another MSM who was living with HIV was also found to be positively associated with CAI. If men with an increased likelihood of engaging in sexual risk behavior are in the same sexual networks as other HIV positive men, then, the concordance of these behaviors could potentially contribute to further HIV transmission (although we recognize also that there are situations where they might not, for example, if men are serosorting or there are high levels of viral suppression). Taken together, our findings indicate that there is potential for further HIV transmission among MSM in Mali, and an urgent need for increased HIV prevention efforts.

The level of CAI observed in the current study was within the range reported by other studies in West African countries (43.4–90.0%),[12–16] although we note that there were considerable differences in the way that UAI has been measured across these studies. The factors that we found to be associated with CAI differed somewhat from those found in a survey of MSM in Abidjan, Cote d'Ivoire.[17] Indeed, these are unique epidemics with distinct socio-cultural contexts. For example, two factors that were associated with UAI in Cote d'Ivoire, alcohol consumption and having bought sex, were much less common in the current study.

Findings from this survey should be interpreted in the context of some limitations. First, the cross-sectional survey design limits the ability to infer causality. Second, by using RDS, the overall survey sample should theoretically represent the underlying population MSM in Bamako; however, the sample consisted of mostly younger, educated men, many of whom were currently students. The difficulty identifying older MSM has been a challenge in other sub-Saharan African countries.[17,52–54] As a result, it is unclear how well the results extend to older MSM. Third, we may have underestimated the proportion of MSM at risk of HIV acquisition or onwards transmission due to inconsistent condom use because we only assessed condom use at last sex. Fourth, this study did not take into account the use of HIV pre-exposure prophylaxis (PrEP). As PrEP has only recently become available in Mali (with <300 estimated current PrEP users as of July 2019), we assumed all CAI to be UAI. As PrEP becomes increasingly available and utilized in Mali, future research should take it into account when assessing sexual risk behavior and modes of HIV transmission. Fifth, our study sample includes cis-MSM and transgender women. The experiences, risks, and health of cis-MSM and transgender women likely differ, and we do not wish to conflate transgender women with cis-MSM. However, our study was not suitably powered to differentiate between cis-MSM and transgender women, thus it is a limitation. Lastly, data were based on self-report and questionnaires were interviewer administered, thus HIV-related risk factors may have been underreported due to social desirability bias.

These limitations notwithstanding, the current study is the first to describe the associated risk factors of CAI in a representative, bio-behavioral survey among MSM in Bamako, Mali. In terms of the HIV epidemic, high levels of CAI might help to explain the elevated HIV prevalence in this key population (although the relationship between CAI and HIV

infection were not associated in a previous study that used the same sample),[4] and suggests that HIV could continue to spread in this group. The findings that barriers to condom access and motivation to use condoms increase men's likelihood to engage in sexual risk behavior suggest the need for HIV prevention efforts that provide tailored education regarding HIV risk among MSM, and that address motivation to use condoms. This is especially important as nearly a third of men who were able to get condoms when needed still reported having engaged in condomless sex. It merits further exploration as to whether the current HIV prevention services are sufficient or are other factors at play that would require going beyond improving HIV-related knowledge and providing further resources. For example, interventions that are informed by theory on behavior change and which address psychosocial constructs related to sexual risk behavior could be useful in this setting. Some of these behavior change theories and interventions also include a focus on social and structural determinants of sexual risk behavior, which were not specifically addressed by this survey, but which are important determinants of condom use and HIV among African MSM populations,[55] and merit further attention in this setting. In summary, increasing HIV prevention efforts should be a public health priority in order to help limit the spread and impact of HIV in this key population.

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Table 1.

Sociodemographic characteristics of MSM in Bamako, Mali during October 2014 and February 2015 ($N = 552$).[a]

	N	Unweighted %	Weighted %	95% CI
Age (years)				
18–19	71	12.9	15.3	(10.7–19.8)
20–24	291	52.7	54.3	(48.1–60.6)
25–29	89	16.1	13.4	(9.3–17.5)
30–34	36	6.5	7.1	(3.9–10.3)
≥35	65	11.8	9.9	(6.4–13.4)
Highest level of education				
Bambara alphabetization	15	2.7	3.4	(0.8–6.0)
Primary	138	25.0	27.6	(21.8–33.4)
Secondary	254	46.0	47.3	(41.1–53.6)
University	115	20.8	16.4	(12.5–20.4)
Never attended school	29	5.3	5.2	(2.0–8.5)
Marital status				
Married, divorced, separated, or widowed	49	9.8	8.2	(4.9–11.5)
Never married	498	90.2	91.8	(88.5–95.1)
Main occupation				
Student	220	39.9	43.3	(37.1–49.6)
Unskilled labor [b]	29	5.3	5.9	(3.0–8.9)
Professional/services [c]	135	24.5	22.0	(16.8–27.1)
Other, including military and civil service	100	18.1	16.0	(11.6–20.5)
Unemployed	68	12.3	12.7	(8.3–17.2)
Income past month (in CFA)[d]				
<25,000	176	31.9	35.9	(29.8–41.9)
25,000–49,999	105	19.0	18.7	(13.7 – 23.6)
50,000–149,999	103	18.7	15.3	(11.1–19.5)
150,000–299,999	63	11.4	9.1	(6.0–12.2)
≥300,000	27	4.9	3.0	(0.8–5.2)

	N	Unweighted %	Weighted %	95% CI
No income	71	12.9	17.1	(11.8–22.3)
Don't know	7	1.3	1.0	(0.1–1.8)
Nationality				
Malian	535	96.9	94.5	(91.0–98.0)
Other African nationalities	17	3.1	5.5	(2.0–9.0)
Religion				
Muslim	487	88.2	88.3	(84.0–92.6)
Christian	39	7.1	8.5	(4.5–12.5)
Other (Animist/No religion)	26	4.7	3.2	(1.4–5.0)
Gender identity				
Male	387	70.1	72.4	(66.8, 78.0
Female/transgender	165	29.7	27.6	(22.0, 33.2
Sexual identity				
Gay/homosexual	267	48.4	45.2	(38.9–51.5)
Bisexual	283	51.3	54.8	(48.5–61.1)
Straight	2	0.4	1.1	(0.0–3.1)
Sexually attracted only to males	442	80.1	75.1	(69.3–81.0)

[a] All weighted proportions represent population-level estimates.

[b] Including, but not limited to hawker, street vendor, casual laborer, mechanic, and factory worker.

[c] Including, but not limited to teacher, banker, accountant, hairdresser, waiter, bar manager, taxi/bus driver, security, artisan, musician, dancer, and performer.

[d] 25,000 West African Francs (CFA) = $42 US.

Table 2.

Psychosocial and behavioral characteristics of MSM in Bamako, Mali during October 2014 and February 2015 (*N*=552).[a,b]

	N	Unweighted %	Weighted %	95% CI
AUDIT-C screen positive	123	22.3	19.8	(14.7–24.8)
Recreational use of noninjectable drugs	29	5.3	4.2	(2.0–6.4)
Symptoms of depression	182	33.0	29.8	(24.1–35.5)
Age at first sex with another male		22.3	19.8	(14.7–24.8)
< 14 years	71	13.0	11.0	(7.1–14.9)
15–19 years	309	56.7	51.2	(44.9–57.6)
20–24 years	141	25.9	31.5	(25.4–37.5)
25+ years	24	4.4	6.3	(2.7–9.9)
Number of male sexual partners				
1	210	38.1	46.3	(39.9–52.6)
2	135	24.5	22.9	(17.8–28.1)
3+	206	37.4	30.8	(25.3–36.3)
Sexual role with most recent partner				
Insertive	289	53.1	57.2	(51.0–63.5)
Receptive	151	27.8	24.6	(19.1–30.1)
Both	104	19.1	18.2	(13.5–22.8)
Relationship to most recent male sex partner				
Main partner	411	74.6	75.3	(69.9–80.6)
Casual partner	91	16.5	17.7	(12.9–22.4)
Commercial – respondent paid partner	14	2.5	1.7	(0.5–2.8)
Commercial – partner paid respondent	35	6.4	5.4	(2.6–8.2)
Concurrent sexual activity with last male partner[c]	352	63.8	60.6	(54.3–66.9)
Exchanged money, goods, or services for sex (ever)	193	35.0	30.4	(24.5–36.3)
Experienced forced sex (ever)	96	17.4	15.1	(10.6–19.6)
Sex (oral, vaginal, and/or anal) with a woman (ever)	454	82.3	85.8	(82.1–89.5)
Had STI symptoms (past year)	82	14.9	13.4	(9.0–17.7)
Tested for HIV (past year)	277	50.2	47.1	(40.8–53.4)

	N	Unweighted %	Weighted %	95% CI
Knows other MSM living with HIV	67	12.1	8.4	(5.3–11.6)
Exposed to condom outreach	274	49.6	53.0	(46.7–59.3)
Had a condom break during anal sex	72	13.0	14.7	(10.0–19.3)
Believes condom use reduces risk of HIV infection	494	89.8	88.2	(83.8–92.6)
Believes CAI is acceptable under some circumstances[d]	183	33.2	35.0	(28.9–41.0)
Unable to get condoms when needed	130	23.6	27.8	(21.9–33.7)
Did not use free condoms	291	52.7	54.8	(48.5–61.0)
Condomless anal intercourse with last male partner	221	40.0	40.7	(34.5–46.8)

[a] All weighted proportions represent population-level estimates.

[b] All variables included were asked about during the preceding six months unless noted otherwise.

[c] Concurrent sexual activity with most recent male partner was defined as the participant replying affirmatively to either of the items: when you were having a sexual relationship with this person did you have sex with other people? and/or, as far as you know, did this person have sex with other people?

[d] Circumstances included: when one is drunk or high; when one is afraid to ask for condom use or partner refuses to use condoms; when having anal sex with a regular partner; when having anal sex with a nonregular partner; when one is the insertive partner; when one is the receptive partner; when the insertive partner does not ejaculate inside the receptive partner.

AUDIT-C: Alcohol Use Disorders Identification Test – Consumption; MSM: men who have sex with men; STI: sexually transmitted infection; CAI: condomless anal intercourse.

Table 3.

Multivariable associations between selected variables and CAI among MSM in Bamako, Mali during October 2014 and February 2015 (*N*=552).

	Prevalence of CAI	OR	95% CI	P	aOR	95% CI	*p*
Age							
18–19	40.4	0.5	(0.2–1.1)	0.094	0.4	(0.1–1.4)	0.133
20–24	42.1	0.5	(0.2–1.0)	0.051	0.2	(0.1–0.6)	0.005
25–29	59.5	Reference					
30–34	29.7	0.3	(0.1–0.9)	0.031	0.2	(0.1–0.8)	0.028
≥35	15.8	0.1	(0.0–0.6)	0.008	0.1	(0.0–0.4)	0.006
Number of male sexual partners in past six months							
1	26.6	Reference					
2	58.1	3.8	(1.9–7.5)	0.001	3.0	(1.4–6.3)	0.011
3+	48.3	2.6	(1.4–4.7)	0.003	2.0	(1.0–4.3)	0.058
Sexual role with most recent partner							
Insertive	35.3	Reference					
Receptive	40.6	1.3	(0.7–2.4)	0.491	1.2	(0.5–2.6)	0.547
Both insertive and receptive	61.8	3.0	(1.5–5.8)	0.002	3.2	(1.2–8.5)	0.002
Knows other MSM living with HIV							
No	39.1	Reference					
Yes	57.8	2.1	(1.0–4.7)	0.062	3.0	(1.5–6.4)	0.005
Unable to get condoms when needed							
No	29.9	Reference					
Yes	69.4	5.3	(2.8–10.2)	<.0001	6.4	(3.0–13.1)	<0.0001
Believes CAI is acceptable in some circumstances[a]							
No	26.9	Reference					
Yes	66.3	5.3	(3.0–9.6)	<.0001	6.9	(3.5–13.7)	<0.0001

[a]Circumstances include: when drunk or high, afraid to ask or partner refuses, when with a regular partner, when with a nonregular partner, insertive partner, receptive partner, or the partner does not ejaculate inside you.

MSM: men who have sex with men; STI: sexually transmitted infection; CAI: condomless anal intercourse; OR: odds ratio; aOR: adjusted odds ratio.