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SUBSTANCE USE, MENTAL HEALTH, HIV TESTING, AND SEXUAL RISK BEHAVIOR AMONG MEN WHO HAVE SEX WITH MEN IN THE STATE OF MAHARASHTRA, INDIA

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Abstract

Among 433 men who have sex with men in Maharashtra, India who completed an online survey, 23% reported hazardous drinking, 12% illicit substance, and 9% polysubstance use. The overall prevalence of depression and intimate partner violence (IPV) were 58% and 56%, respectively. Participants engaging in hazardous drinking had more sexual partners and were less likely to be married to women. Participants reporting illicit substance use or polysubstance use were more likely to have been out, had more sexual partners, or experienced IPV. Those reporting illicit substance use were more likely to engage in condomless anal sex. Based on our findings, we suggest that public health interventions integrate HIV, substance use, and mental health services.

Most researchers in India have focused on the northern regions where illicit opioid use is a significant public health concern. Because the country is between the golden crescent (Iran, Afghanistan, and Pakistan) and the golden triangle (Myanmar, Thailand, Laos, and Vietnam), areas where much of the region's opium is grown, northern India has increased access to heroin and other opioids. The result is a well-documented opioid epidemic to

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which researchers, government agencies, and nongovernmental organizations have been coordinating a response (Balhara, Gupta, & Lal, 2016; Basu, Gaur, Das, & Mattoo, 2011; Basu, Jhirwal, & Mattoo, 2005; Dayal, Balhara, & Mishra, 2016; De, Mattoo, & Basu, 2003; Dhawan, Chopra, & Ray, 2016; Dhawan, Pattanayak, Chopra, Tikoo, & Kumar, 2016; Government of India, Ministry of Home Affairs, & Narcotics Control Bureau, 2016; Joseph & Badyal, 2016; M. S. Kumar & Sharma, 2008; Singh et al., 2011; Vaswani & Desai, 2004).

However, opioids are not the only substance use concern in India. A National Survey conducted by the Ministry of Social Justice and Empowerment (Pal, Srivastava, Dwivedi, Pandey, & Nath, 2015) estimates national illicit drug use at approximately 3%, with cannabis being the most used substance. The prevalence of illicit substance use likely varies by regions and subpopulations (Murthy, Manjunatha, Subodh, Chand, & Benegal, 2010).

The misuse of alcohol and non-opioid illicit substances remains a public health concern throughout India, not just in the north. Compared to North American and European countries, alcohol consumption is less of a problem in India (Sharma, Tripathi, & Pelto, 2010). The World Health Organization (2014) estimated alcohol use disorders in India at 2.6%, among men 4.5% and among women 0.6%. However, the prevalence of alcohol use and misuse likely varies by region and subpopulations (Heravian et al., 2012; Madhivanan et al., 2005; Rodriguez et al., 2010; Sharma et al., 2010). For example, among persons living in a rural village in Tamil Nadu, alcohol use was 16.8% among men and 1.3% among women (9.4% overall); of those who reported alcohol use, 39.3% met criteria for hazardous drinking to probable dependence (S. G. Kumar et al., 2013).

There are limited data about the prevalence of alcohol and illicit substance use among MSM. Chakrapani, Newman, Shunmugam, Logie, and Samuel (2017) reported that 15% of the MSM in their sample from Tamil Nadu, Maharashtra, Delhi, and West Bengal consumed alcohol at least weekly. Mimiaga et al. (2011) estimated that 28% of MSM in their study consumed alcohol weekly to the point of intoxication, indicative of an alcohol use disorder. Variables Mimiaga et al. associated with intoxicated drinking were being older, married to a woman, using tobacco weekly, and engaging in condomless vaginal and anal sex. Yadav et al. (2014) reported that 60% MSM in their sample from Andhra Pradesh, Tamil Nadu, and Maharashtra consumed alcohol at least weekly. They reported frequent alcohol consumers were most likely to be aged 25 years or older, married, and have had exposure to HIV interventions. These limited data suggest alcohol use among MSM in India should be a concern for persons employed by public health agencies.

There are no reported estimates of illicit substance use among MSM. Mehta and colleagues (2014) used data from 14 cities across India to report on the use of cocaine and methamphetamine among all people who inject drugs. Among persons in this study who injected stimulants, 23% were MSM. Mehta et al.'s analysis suggests that MSM consume methamphetamine at higher rates than the general population, however, additional research is needed.

Recently, researchers in India began documenting the association between poly-substance and co-occurring mental health, HIV, and hepatitis C diagnoses among Indian MSM

(Chakrapani et al., 2017; Kermode et al., 2016; Latkin et al., 2010, 2011; McFall et al., 2017; Naggie & Sulkowski, 2012). To add to this literature, the purpose of our analysis was to estimate the prevalence of three substance use outcomes from an online sample of Indian MSM in Maharashtra (hazardous drinking, illicit substance use, and polysubstance use) as well as estimating the strength of the association between the three substance use outcomes and participants' characteristics.

METHODS

PARTICIPANTS

Participants were recruited as part of ISHKonnect, a multiphase study exploring how MSM used technology to meet sexual partners. Participants were recruited between September 2013 and May 2014 via banner advertisements on gay websites, social media platforms, and in person via Lesbian, Gay, Bisexual, and Transgender (LGBT) and HIV outreach events. Eligibility requirements included identifying as MSM, being over the age of 18, living in Maharashtra, having regular access to the internet via web browser or smartphone, and having had at least one male sex partner in the past 90 days. Eligible men were required to provide consent through an online form. Eligibility determination, consent, and survey instruments were available in Hindi, Marathi, or English. To ensure the final sample only included participants who met eligibility criteria, we followed our deduplication protocol used in other online studies (Grey et al., 2015). At the end of recruitment process, 449 participants completed the survey. On average, the survey took 30 minutes to complete. Participants received 300 Indian Rupees (approximately 5.00 USD). Full details regarding recruitment and eligibility have been previously published (Wilkerson, Patankar, et al., 2016). Those who identified as hijra/transgender ($n = 16$) were excluded from this analyses, resulting in a sample of 433 participants. The institutional review boards of the authors' institutions approved study protocols.

MEASURES

The online survey consisted of approximately 200 items eliciting information on demographics, relationship status, physical and mental health status, technology use, sexual behavior, alcohol consumption, and illicit substance use behavior. Measures included in this analysis were associated with substance use, hazardous alcohol use, and HIV risk factors.

Substance Use Measures.—Risk for hazardous drinking was measured by the Alcohol Use Disorders Identification Test (AUDIT-C; Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998; Pal, Jena, & Yadav, 2004), which has also been validated in Indian populations (Nayak, Bond, Cherpitel, Patel, & Greenfield, 2009). This three-item scale was used to determine frequency of alcohol consumption, how many standard alcohol drinks (equivalent to 12 oz. of 5% alcohol beer, 8–9 oz. of 7% alcohol beer, 5 oz. of 12% alcohol wine, or 1.5 oz. of 50% alcohol distilled spirits) were consumed on a typical day when drinking, and how often six or more standard alcohol drinks were consumed on one occasion. Participants reporting binge drinking and scoring greater than or equal to 4 were categorized as engaging in hazardous drinking within the past 12 months. Internal consistency for the scale was fair (sample $\alpha = 0.61$).

Participants were asked how often they used various substances for nonmedical purposes in the past 12 months. Responses ranged from 0 (never) to 4 (daily or almost daily). Illicit substances included opioids, inhalants/whitener, brown sugar/garda, marijuana, cocaine, amphetamines, and barbiturates. Participants' responses were dichotomized to reflect use in the past year. Those who reported the use of one or more illicit substances in the past 12 months were categorized as illicit substance users. Those who reported any two or more illicit substances or one illicit substance and met criteria for hazardous drinking were categorized as polysubstance users.

Participant Characteristics.—Demographic characteristics included city of residence (Mumbai or other), young MSM (18–24 years or 25+), married to a woman, income levels (≤ INR 25,000 or ≥ INR 25,001), highest level of education (college degree or not), being in a monogamous relationship, and being in a long-term relationship. Demographic characteristics were dichotomized for these analyses.

Participants were asked when they last experienced various types of intimate partner violence (IPV) from a male partner they met either online or offline. Experiences indicated "the last time a man you met online/offline," "stole from you," "demanding money after having sex," "punched, hit, kicked, or beat you," and "forced you to do a sexual act you did not want to do." Available responses were never, within the past 24 hours, last 7 days, last 4 weeks, last 6 months, last 12 months, last 5 years, or over 5 years ago. Participants' responses were dichotomized to compare participants who had or had not experienced these forms of violence in the past 12 months.

Depressive symptoms were measured using the Short Form Center for Epidemiologic Studies Depression Scale – 10-item version (CESD-10; Andresen, Malmgren, Carter, & Patrick, 1994; Zhang et al., 2012). Participants scoring 10 or more were categorized as potentially having mild or significant depressive symptoms (Andresen et al., 1994; Zhang et al., 2012). Internal consistency for the scale was good ($\alpha = 0.84$).

A single-item measure was used to determine the degree of openness about their same- sex attraction to family and friends (outness; Wilkerson, Noor, Galos, & Rosser, 2016). The five-point scale ranged from 1 (Not at all open to most people I know) to 5 (Open to all or most people I know). Participants rating their outness as a 4 or more were dichotomized to being out to half or more than half of their family and friends.

HIV risk factors included having received an HIV test in the past 12 months, engaged in condomless anal sex (CAS) with a male partner the past 3 months, engaged in transactional sex in the past 3 months, and testing positive for a STI. Transactional sex included participants who reported having engaged in or received sex in exchange for money, goods, or services. Participants' responses were coded dichotomously (yes/no). In addition, the total number of sexual partners was analyzed as a continuous variable. The number of partners was censored to exclude those who reported more than two standard deviations (> 61.8) because of questionable outliers ($n = 6$).

STATISTICAL ANALYSES

We used STATA-IC version 14 (StataCorp., 2015) for all analyses. We conducted bivariate analyses to assess for the differences in personal characteristics between participants who did or did not engage in hazardous drinking, illicit substance use, or polysubstance use (Table 1). We entered variables found significant with a $p \leq 0.10$ into multivariate logistic regression models to estimate the odds ratios of variables associated with the three dependent variables (Table 2).

RESULTS

PARTICIPANT CHARACTERISTICS

The majority of participants lived in the Mumbai/Thane region (74.3%), were more than 25 years old (70.0%), not married to a woman (89.1%), and were in the middle and upper income brackets (55.4%). Nearly half were college educated (45.9%). The majority of participants reported experiencing IPV within the past 12 months (56.3%), met criteria for mild depressive symptoms (57.5%), and reported having tested for HIV in the past 12 months (58.4%). Twenty-three percent of participants met criteria for hazardous drinking. Approximately 12.2% of participants ($n = 53$) reported using an illicit substance in the past 12 months. Among participants reporting illicit substance use, the most commonly used illicit substances were marijuana (92.5%) was the more reported illicit substance, followed by cocaine (24.5%), amphetamines (18.9%), inhalants/whitener (7.5%), opioids (7.5%), barbiturates (5.7%), and brown sugar/garda (1.9%).

HAZARDOUS DRINKING

Compared to participants who did not meet the criteria for hazardous drinking, those who met criteria were less likely to be married to a woman ($p = .012$), in the middle- to upper-class income brackets ($p < .001$), experienced IPV ($p = .018$), were out to more than half of their friends or family ($p = .006$), received an HIV test ($p = .082$), and had more sexual partners ($p < .001$; Table 1). When entered into a multivariate logistic regression model, participants who met criteria for hazardous drinking were less likely to be married to a woman (OR = 0.33, 95% CI [0.11, 0.97]), have more sexual partners (OR = 1.05, 95% CI [1.02, 1.08]), and have higher income levels (OR = 2.62, 95% CI [1.50, 4.58]).

ANY ILLICIT SUBSTANCE USE

Compared to participants who reported no illicit substance use, those who did were less likely to be married to a woman ($p = .024$), not in a long-term relationship ($p = .061$), experienced IPV ($p = .003$), were out to more than half of their friends or family ($p < .001$), had more sexual partners ($p = .006$), and engaged in CAS with a male partner ($p = .006$; Table 1). When entered into a multivariate logistic regression model, those who engaged in illicit substance use were less likely to be married to a woman (OR = 0.18, 95% CI [0.02, 1.45]), more likely to have been out to more than half of friends and family (OR = 2.45, 95% CI [1.26, 4.77]), had more sexual partners (OR = 1.03, 95% CI [1.00, 1.06]), experienced IPV in the past 12 months (OR = 2.21, 95% CI [1.12, 4.38]), and engaged in CAS with a male partner (OR = 2.43, 95% CI [1.22, 4.82]; Table 2).

POLYSUBSTANCE USE

Compared to participants who reported no polysubstance use, those who did reported polysubstance use were less likely to be married to a woman ($p = .078$), have experienced IPV ($p < .001$), to be out to more than half of their friends or family ($p = .001$), received an HIV test in the past 12 months ($p = .047$), had more sexual partners ($p < .001$), engaged in CAS with a male partner ($p = .057$), and engaged in transactional sex ($p = .057$). When entered into a multivariate logistic regression model, participants who engaged in polysubstance use were more likely to have been out to more than half of their friends and family (OR = 2.94 [95% CI: 1.32, 6.58]), had more sexual partners (OR = 1.04, 95% CI [1.01, 1.08]), and have experienced IPV (OR = 6.33, 95% CI [2.13, 18.83]).

DISCUSSION

To our knowledge, we are the first to report estimates of hazardous drinking as measured by the AUDIT-C, illicit substance use, and polysubstance use among internet-using Indian MSM in Maharashtra. Nationally, it is estimated that the prevalence of alcohol and/or substance use disorders is 5.8 to 7.3% (Reddy & Chandrashekar, 1998) and illicit substance use is 3% (Pal et al., 2004). These estimates are far lower than the prevalence of substance use found in our participants. We found a higher prevalence of hazardous drinking (23.1%), illicit substance use (12.2%), and poly-substance use (9.0%) than previously reported (Chakrapani et al., 2017; S. G. Kumar et al., 2013; Mimiaga et al., 2011; Reddy & Chandrashekar, 1998; Sathyanarayana Rao et al., 2014). Our hazardous drinking estimate of 23.1% is 4 to 5 times higher than estimates of the general population (Reddy & Chandrashekar, 1998; Sathyanarayana Rao et al., 2014).

By targeting a group of MSM with regular access to the internet, we were able to capture a group with varying income levels. We found that MSM with higher income levels were more likely to report hazardous drinking. Our finding differs from Sathyanarayana Rao et al. (2014) who reported that lower income individuals living in rural south India were more likely to have an alcohol use disorder. Additional research is needed to determine the extent to which differences in alcohol consumption are more correlated with sexual identity, living in an urban versus rural environment, or some other characteristic.

Historically, married men in India have been found to have hazardous alcohol use disorders more than unmarried men (Sundaram, Mohan, Advani, Sharma, & Bajaj, 1984). However, we found that unmarried MSM had a high prevalence of alcohol use disorders. Our findings suggest that unmarried MSM should be targeted for substance use interventions.

Our findings bring attention to the alarming prevalence of mental health and IPV among substance-using MSM. Shaw et al. (2012) found a prevalence rate of 18% of experiencing sexual violence within the past 12 months among MSM and transgender persons in India. Our results found a prevalence of IPV higher than other published studies with 56.3% of participants reporting one or more experiences in the past 12 months; estimates were higher among participants engaging in hazardous drinking (66.7%), illicit substance use (75.5%), or polysubstance use (84.6%). Our results reflect an extremely high prevalence of participants with having a CESD-10 score indicative of depressive symptoms (57.5%) (Grover, Dutt, &

Avasthi, 2010). These prevalence rates are significantly higher than those of the general population (4.8 to 15.1%; Poongothai, Pradeepa, Ganesan, & Mohan, 2009; Reddy & Chandrashekar, 1998; Sathyanarayana Rao et al., 2014; Shidhaye, Gan-gale, & Patel, 2016) and those among MSM in India (11%; Tomori et al., 2016). Moreover, of the people with depressive symptoms, only about half discussed their depression with friends or a family member, and only 4.3% sought help from a professional (Shidhaye et al., 2016). We suggest screening all MSM (and especially those using illicit substances) for depression and IPV, and, when appropriate, linking them to services.

We found that 82% of participants were not in monogamous relationships, and had an average of 6.5 sexual partners within the past 3 months, increasing the risk of HIV acquisition. When we compared participants reporting hazardous drinking, illicit substance use, and polysubstance to participants who did not reporting drinking or using illicit substances, the total number of sexual partners, the number of men with whom participants reported engaging in CAS with a male partner, and the engagement in transactional sex was higher among drinkers and illicit substance users. Therefore, it was also important to look at the prevalence of HIV testing and sexual behavior associated with HIV transmission among those who report hazardous drinking and illicit substance use. Overall, self-reported HIV testing among participants was 58.6%. HIV testing rates were higher among participants engaging in hazardous drinking (66.3%), illicit substance use (67.4%), and polysubstance use (74.3%), suggesting an optimal opportunity for service integration. When MSM present for HIV testing, service providers could also screen for alcohol and substance use disorders, mental health disorders, IPV, and other commonly occurring co-morbid diagnoses such as Hepatitis C and latent tuberculosis.

Findings from our analysis are limited by the cross-sectional study design, a convenient online sample, and a limited number of substance use items and psychosocial assessments. A longitudinal study is needed to understand the temporal relationships between substance use outcomes and variables associated with each of the outcomes. Because results are from an online convenience sample, and at the time of the study the internet penetration rates were approximately 20% of the population in India (Poushter, 2016), findings cannot be generalized to all MSM. Future research should consider respondent driven sampling or randomization to strengthen generalizability. Our findings suggest a need for a more in-depth study of the health concerns of MSM who use illicit substances in India, and adaption of existing or development of new public health interventions.

Our findings are significant because they provide researchers with prevalence estimates of hazardous drinking, illicit substance use, and polysubstance use among internet-using MSM in Maharashtra. We also provide estimates of co-occurring mental health, IPV, and HIV testing among a subpopulation of substance-using MSM. Because of the high prevalence of co-occurring diagnoses, especially among MSM engaging in hazardous drinking and illicit substance use, public health agencies and nongovernmental agencies should consider integrating HIV screening and treatment with substance use and mental health services.

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TABLE 1.

Baseline Characteristics, Bivariate Analyses

	Full Sample	Hazardous Drinking			Any Illicit Substance Use			Poly substance Use		
	N = 433	Yes, *n* = 100 (23.1%)	No, *n* = 333 (76.9%)	*p*	Yes, *n* = 53 (12.2%)	No, *n* = 380 (87.8%)	*p*	Yes, *n* = 39 (9.0%)	No, *n* = 394 (91.0%)	*p*
Characteristic	***n* (%)**	***n* (%)**	***n* (%)**		***n* (%)**	***n* (%)**		***n* (%)**	***n* (%)**	
Lives in Mumbai										
Yes	323 (74.6)	80 (80.0)	243 (73.0)	.157	44 (83.0)	279 (73.4)	.133	32(82.1)	291 (73.9)	.262
No	110 (25.4)	20 (20.0)	90 (27.0)		9 (17.0)	101 (26.6)		7(18.0)	102 (26.1)	
Age										
18–24 years old	130 (30.0%)	24 (24.0)	106 (31.8)	.134	17(32.1)	113 (29.7)	.728	131(28.2)	119 (30.2)	.795
25+ years old	303 (70.0)	76 (76.0)	227 (68.2)		28 (71.8)	270 (69.8)		36 (67.9)	267(10.3)	
Married to a woman (*n* = 420)										
Yes	46(11.0)	4 (4.0)	42(13.1)	.012 *	1 (1.9)	45 (12.3)	.024 *	1 (2.6)	45 (11.8)	.078 †
No	374 (89.1)	95 (96.0)	279 (86.9)		52 (98.1)	322 (87.7)		38 (97.4)	336 (88.2)	
Income (*n* = 403)										
≥ 25,001	223 (55.3)	66 (71.7)	157(50.5)	< .001 **	27 (56.3)	196 (55.2)	.892	20 (57.1)	203 (55.2)	.822
≤ 25,000	180 (44.7)	26 (28.3)	154 (49.5)		21 (43.8)	159 (44.8)		16(38.1)	164 (45.4)	
Graduated college (*n* = 425)										
Yes	370 (87.1)	86 (87.8)	284 (86.9)	.815	44 (84.6)	326 (87.4)	.575	34 (87.2)	336 (87.1)	.981
No	55 (12.9)	12 (12.2)	43 (13.2)		8 (15.4)	47(12.6)		5 (12.8)	50 (13.0)	
Bellaviorally bisexual										
Yes	78 (18.0)	17(17.0)	61 (18.32)	.764	10 (18.9)	68 (17.9)	.863	8 (20.5)	70 (17.8)	.670
No	355 (82.0)	83 (83.0)	272 (81.7)		43 (81.1)	312(82.11)		31 (79.5)	324 (82.2)	
In a long-term relationship (*n* = 417)										
Yes	203 (48.7)	49 (50.5)	154 (48.1)	.68	19 (36.5)	184 (50.4)	.061 *	19 (50.0)	184 (48.6)	.865
No	214 (51.3)	48 (49.5)	166(51.88)		33 (63.5)	181 (49.6)		19 (50.0)	195 (51.5)	
In a monogamous relationship										
Yes	79 (18.2)	14 (14.0)	65 (19.5)	.21	8 (15.1)	71 (18.7)	.526	6 (15.4)	73 (18.5)	.628
No	554 (81.8)	86 (86.0)	268 (80.5)		45 (84.9)	309 (81.3)		33 (84.6)	321 (81.5)	
Experienced intimate partner violence (*n* = 430)										

	Full Sample	Hazardous Drinking			Any Illicit Substance Use			Poly substance Use		
	N = 433	Yes, *n* = 100 (23.1%)	No, *n* = 333 (76.9%)	*p*	Yes, *n* = 53 (12.2%)	No, *n* = 380 (87.8%)	*p*	Yes, *n* = 39 (9.0%)	No, *n* = 394 (91.0%)	*p*
Characteristic	***n* (%)**	***n* (%)**	***n* (%)**		***n* (%)**	***n* (%)**		***n* (%)**	***n* (%)**	
Yes	242 (56.3)	66 (66.7)	176 (53.2)	.018 *	40 (75.5)	202 (53.6)	.003 *	33 (84.6)	209 (53.5)	< .001 *
No	188 (43.7)	33 (33.3)	155 (46.8)		13 (24.5)	175 (46.4)		6 (15.4)	182 (46.6)	
Depression symptoms (CESD-10; *n* = 421)										
Yes	242 (57.5)	57 (56.9)	185 (56.9)	.669	32 (61.5)	210 (56.9)	.527	23 (59.0)	219 (57.3)	.843
No	179 (42.5)	39 (40.6)	140 (43.1)		20 (38.5)	159 (43.1)		16(41.0)	163 (42.7)	
Out to friends or family (*n* = 429)										
Half or all	80 (18.7)	28 (28.0)	52(15.8)	.006 *	18 (34.0)	62(16.5)	.002 *	15 (38.5)	65 (16.7)	.001 *
Less than half	349 (81.4)	72 (72.0)	277 (84.2)		35 (66.0)	314 (83.5)		24(61.5)	325 (83.3)	
Received an HIV test in the past 12 months (*n* = 416)										
Yes	243 (58.4)	61 (66.3)	182 (56.2)	.082f	33 (67.4)	210 (57.2)	.177	26 (74.3)	217(57.0)	0.047 *
No	173 (41.6)	31 (33.7)	142 (43.8)		16 (32.7)	157 (42.8)		9 (25.7)	164 (43.0)	
HIV positive (*n* = 428)										
Yes	9 (2.1)	5 (5.2)	4(1.2)	.017 *	3 (5.7)	6(1.6)	.054f	3 (7.7)	6(1.5)	.011 *
No	419 (97.9)	92 (94.9)	327 (98.8)		50 (94.3)	369 (98.4)		36 (92.3)	383 (98.5)	
HIV status unknown (*n* =428)										
Yes	96 (22.4)	17(17.5)	79 (23.9)	.188	15 (28.3)	81 (21.6)	.274	9 (23.1)	87 (22.4)	.919
No	332 (77.6)	80 (82.5)	252 (76.1)		38 (71.7)	294 (78.4)		30 (22.4)	302 (77.6)	
Diagnosed with an STI in the past 12 months										
Yes	11 (2.6)	7 (7.1)	4(1.2)	.004 *	3 (5.7)	8 (2.1)	.124	3 (7.7)	8 (2.0)	.068 †
No	421 (97.5)	92 (92.9)	329 (98.8)		50 (94.3)	371 (97.9)		36 (92.3)	385 (98.0)	
Total number of partners in the past 3 months (Censored[a]) mean (*SD*) *n* = 427	6.47 (8.27)	9.59 (11.82)	5.52 (6.59)	< .001 **	9.38 (11.4)	6.05 (1.7)	.006 *	11.18 (12.7)	5.99 (7.54)	.0002 *
Condomless anal sex with a male partner										
Yes	80 (18.5)	24 (24.0)	56(16.8)	.105	17(32.1)	63 (16.6)	.006 *	12(30.8)	68 (17.3)	.038 *
No	353 (81.5)	76 (76.0)	277 (83.2)		36 (67.9)	317(83.4)		27 (69.2)	326 (82.7)	
Engaged in transactional sex										

Characteristic	Full Sample	Hazardous Drinking			Any Illicit Substance Use			Poly substance Use		
	N = 433	Yes, *n* = 100 (23.1%)	No, *n* = 333 (76.9%)	*p*	Yes, *n* = 53 (12.2%)	No, *n* = 380 (87.8%)	*p*	Yes, *n* = 39 (9.0%)	No, *n* = 394 (91.0%)	*p*
	n (%)	*n* (%)	*n* (%)		*n* (%)	*n* (%)		*n* (%)	*n* (%)	
Yes	49 (11.3)	14 (14.0)	35 (10.5)	.334	9 (17.0)	40 (10.5)	.165	8 (20.5)	41 (10.4)	.057 *
No	384 (88.7)	86 (86.0)	298 (89.5)		44 (83.0)	340 (89.5)		31 (79.5)	353 (89.6)	

Note.

† Significant < .10.

* Significant < .05.

** Significant < .001.

[a] Excludes those who reported more than two standard deviations.

TABLE 2.

Logistic Regression Analyses

	Odds Ratio	95% CI
Hazardous Drinking		
Variable		
Married to a woman	0.33*	0.11, 0.97
Out to more than half of friends and family	1.57	0.84, 2.95
Total number of partners	1.05**	1.02, 1.08
Received HIV test	1.44	0.83, 2.50
Experienced intimate partner violence	1.50	0.88, 2.57
Income ≥ 25,001	2.62*	1.50, 4.58
Any Illicit Substance Use		
Variable		
Married to a woman	0.18	0.02, 1.45
Out to more than half of friends and family	2.45*	1.26, 4.77
Total number of partners	1.03*	1.00, 1.06
Experienced intimate partner violence	2.21*	1.12, 4.38
Engaged in condomless anal sex	2.43*	1.22, 4.82
Long-term relationship	0.65	0.34, 1.25
Polysubstance Use		
Variable		
Married to a woman	0.29	0.04, 2.24
Out to more than half of friends and family	2.94*	1.32, 6.58
Total number of partners	1.04*	1.01, 1.08
Experienced intimate partner violence	6.33*	2.13, 18.83
Received an HIV test	2.20	0.95, 5.08
Engaged in condomless anal sex	1.64	0.41, 3.96
Engaged in transactional sex	1.15	0.41, 3.24

*Significant <.05.

**Significant < .001.