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Alcohol and Cocaine Use Among Latino and African American MSM in 6 US Cities

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Gay, bisexual, and other men who have sex with men (MSM) are disproportionately affected by HIV. MSM comprise roughly 2% of the US population, yet approximately two-thirds of new HIV infections are among MSM (Centers for Disease Control and Prevention, 2016). Additionally, significant racial and ethnic disparities exist with respect to HIV transmission among MSM. Based on the current HIV diagnoses rates in the US, about 1 in 2 African American men who have sex with men (AAMSM), 1 in 4 Latino MSM (LMSM) and 1 in 11 white MSM will be diagnosed with HIV during their lifetime (Center for Disease Control and Prevention (CDC), 2016a). In general, substance-using MSM are among the groups with the greatest risk for HIV infection (Centers for Disease Control and Prevention, 2011; Margolis, Joseph, Hirshfield, et al., 2014; Pines, Gorbach, Weiss, et al., 2014; Plankey, Ostrow, Stall, et al., 2007); nearly a third of incident HIV infections among MSM may be associated with non-injection drug use (Mansergh et al., 2008; Van Tieu & Koblin, 2009).

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Substance-using sexual minorities are more likely to underutilize substance use treatment (McCabe, Bostwick, Hughes, West, & Boyd, 2010) and may be an HIV transmission bridge to non-drug-using populations (Lambert et al., 2011).

With respect to alcohol use, high rates of both alcohol consumption and binge drinking have been documented among MSM populations (Finlayson et al., 2011). Additionally, previous studies have found associations between heavy drinking, as define as having 6 or more drinks on one occasion or 4 or more drinks daily, and HIV risk behaviors among MSM, such as condomless anal intercourse and greater number of sexual patterns (Colfax et al., 2004; Greenwood et al., 2001; Koblin et al., 2003a; Woolf & Maisto, 2009). Previous studies also suggest that many substance-using MSM populations engage in use of multiple substances, often concomitantly (Santos et al., 2013). There also may be a dose response with number and frequency of substances used with respect to condomless anal sex among HIV negative MSM (Santos et al., 2013). However, patterns of substance-use vary across racial and ethnic MSM populations, e.g. African American substance-using MSM being more likely to use crack/cocaine relative to other substance-using MSM populations (Goldstein, Burstyn, LeVasseur, & Welles, 2016; Halkitis & Jerome, 2008; Hatfield, Horvath, Jacoby, & Simon Rosser, 2009; Mimiaga, Reisner, Fontaine, et al., 2010; Paul, Boylan, Gregorich, Ayala, & Choi, 2014). Thus, it is important to better understand patterns of concomitant substance-use, e.g. methamphetamine, crack/cocaine and alcohol, across specific sociodemographic categories among MSM populations (Santos et al., 2013). Sociodemographic characteristics which may be particularly relevant for specific MSM populations include poverty and history of incarceration. For example, pronounced racial disparities have been found between AAMSM and other MSM populations with respect to structural barriers, such as low income, unemployment and incarceration, associated with HIV infection (Millet, Peterson, Flores, Hart, et al., 2012). Additionally, a recent study conducted by Rutledge et al, found a high proportion of MSM reporting both a history of incarceration and substance use. This study found rates of incarceration highest among men who classified themselves as “down-low”, e.g. endorsing secrecy about same-sex sexual behavior, promting the authors to posit that this population may engage in trading sex for money more often and thus increase their risk for incarceration (Rutledge, Jemmott, O'Leary, & Icard, 2016).

An additional area that warrants attention is the mental health of substance-using MSM. Marshall et al, found an increase in depressive symptomology among heavy-drinking MSM (Marshall, Shoveller, Kahler, et al., 2015a). Other studies have documented high rates of depression, distress and post-traumatic stress disorder (PTSD) among MSM populations (Marshall et al., 2015a; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Rutledge et al., 2016). Thus, there is a growing consensus that many MSM face co-occurring mental health and substance use disorders which warrant integrated treatment approaches (Batchelder, Saften, Mitchell, Ivardic, & O'Cleirigh, 2017). Furthermore, the increased HIV burden, both in terms of HIV risk and HIV acquisition, among AA MSM and LMSM may exacerbate the vulnerability to mental health problems (Bedoya, Mimiaga, Beauchamp, et al., 2012).

Numerous studies have documented associations between drug and alcohol use and HIV transmission risk (Colfax et al., 2004); (Koblin, Chesney, Husnik, et al., 2003b; Mayer, Wang, Koblin, et al., 2014; Ostrow, Plankey, Cox, et al., 2009; Pappas & Halkitis, 2011;

Sander, Cole, Stall, et al., 2013; Skeer, Mimiaga, Mayer, et al., 2012). However, MSM subpopulations are not homogenous and often exhibit different substance-use related risk profiles (Newcomb, Ryan, Greene, et al., 2014). A recognition that different patterns of substance use among MSM populations may be associated with poor health or substance use treatment related outcomes is important in order to better tailor risk-reduction and substance use treatment related interventions (Tobin, Yang, King, et al., 2015). Thus, understanding how specific types of risk behaviors interact to place substance-using MSM populations, including those with co-occurring mental health disorders, at potentially greater overall risk for HIV infection and transmission can guide the development of intervention frameworks addressing multiple risk behaviors for these populations. Additionally, amelioration of the adverse consequences associated with such risk profiles may have important implications for HIV disease progression and achieving optimal clinical outcomes among those MSM who are HIV-positive.

We sought to determine the correlates of substance use (binge drinking and crack/cocaine use) among AAMSM and LMSM enrolled across six cities in the United States in a study to evaluate the preliminary efficacy of recently developed behavioral interventions to reduce HIV transmission among AAMSM and LMSM.

Methods

Data came from the Latino and African American Men's Project (LAAMP), a CDC-funded multi-site, randomized HIV behavioral intervention project. AAMSM were enrolled from Baltimore, Chicago, greater Milwaukee /greater Detroit region, and New York City, and Latino MSM were enrolled from Miami and New York City. Data reported here are from baseline interviews that were collected from 2008–2009. Institutional review boards at each of the study locations and the Centers for Disease Control and Prevention approved the questionnaire, data collection and study procedures. Participants were reimbursed between $25–$40 for participation, depending on study site.

Recruitment

Recruitment occurred at gay bars, dance clubs, house parties, gay chatrooms, college campuses, health departments, and community-based organizations that provided services to the MSM population. Additional methods included referrals from study participants and service providers, online chatrooms, the placement of recruitment materials (flyers and study cards) at locations frequented by MSM and the placement of ads in local gay magazines and newspapers.

A brief screening was conducted to identify eligible men for the studies. Written informed consent was obtained for individuals who indicated a willingness to participate and who met eligibility requirements. Eligibility criteria across the six sites included being at least 18 years of age, identifying as male and African American or black or Latino, having at least 2 sexual partners in the past 3 months (at least 1 of whom must have been male) and engaging in anal sex without condoms with a man in the past three months. For the four African American sites, participants' HIV status was not part of the eligibility criteria. However, participants were required to take an HIV-test if they indicated their HIV-status as negative

or unknown to stay in the study. If they provided documentation of their being HIV-positive, testing was not conducted. Although HIV-testing was available to all participants at the Latino sites, it was not conditional for participation in the study. Since one of the goals was to examine if participants took an HIV test after completing the intervention, the eligibility criteria were slightly different. Latino participants had to be between 18 and 49 years of age and report being HIV-negative or unknown status during the baseline interview. Latino and African American participants were ineligible to participate if they identified as transgender, or did not reside in the catchment areas where the interventions were occurring for all sites.

At the baseline visit, participants reconfirmed eligibility and provided written informed consent. Participants completed a behavioral assessment using audio computer-assisted self-interview (ACASI) technology. Following completion of the assessment, all participants received HIV risk-reduction counseling. A rapid HIV antibody test was conducted if participants self-reported being HIV-negative, or did not know their current HIV status. Preliminary positive rapid test results at the baseline visit were confirmed by Western blot testing. New positive HIV-participants were referred to medical and social services and informed they could rescreen in six months to participate in the intervention. One site allowed already-enrolled participants who were newly diagnosed with HIV to be randomized and participate in the study without delay. Reimbursement for participation (time and expenses) was determined by each site.

Measures

Questions were asked on the frequency of substance-use, including alcohol, marijuana, ecstasy, powered cocaine, rock/crack cocaine, methamphetamines/other amphetamines, poppers, club drugs, heroin, Viagra, recreational/prescription drugs. Other than marijuana and alcohol, the most commonly reported drug frequently used by participants in this sample was crack/cocaine. The prevalence of other drug use, e.g. heroin (2.1 %) and methamphetamine (0.8%), was relatively low, thus, we chose to focus our analyses on frequency of crack/cocaine use among study participants. Additionally, while questions on the frequency of powdered cocaine and crack cocaine use were asked separately we chose to combine powdered cocaine and crack cocaine into one variable as frequent cocaine use and to maximize the statistical power for our analyses. The current analyses focused on frequent binge drinking, and frequency of crack/cocaine use over the last 3 months. Frequent binge drinking was assessed using one of items from the Alcohol Use Disorders Identification Test (AUDIT)-C (Frank et al., 2008) “Over the last 3 months, how often did you have six or more drinks on one occasion?” Frequeny of crack/cocaine use was assessed by one question “Over the last 3 months, how often did you use powdered cocaine/rock or crack cocaine?” Response options for both questions being “never,” “less than once a month,” “once a month,” “2 or 3 days a month,” “once a week,” or “2 or 3 days a week.” If participant responded “once a week” or “2 or 3 days a week” to any of these questions, they were classified as frequent binge drinker or frequent crack/cocaine users. A 4-level nominal variable was constructed as “0-not frequent binge drinker or frequent crack/cocaine user,” “1-frequent binge drinker, but not frequent crack/cocaine user,” “2-frequent crack/cocaine user, but not frequent binge drinker,” and “3-frequent binger drinker and frequent crack/cocaine user”.

Individual socio-demographic and behavioral covariates

Socio-demographic characteristics measured included self-reported race/ethnicity (AA or Latino), age, and highest educational grade completed. Participants indicated their current employment status as working full or part time, not working, or on disability and last year's personal income from all sources. Lack of resources in the household was assessed by asking the frequency of not having enough money for rent, food or utilities, such as gas, electric, phone. Participants were asked about their current living arrangement with options "Your own house or apartment," "Your parent(s) or another family member's house or apartment," "At someone else's house or apartment", "In a rooming, boarding, halfway house, or a shelter/welfare hotel," "On the street(s) (vacant lot, abandoned building, park, etc.)" or "other." To assess sexual identity, participants were asked to pick from the six categories in the following question: "Do you consider yourself to be heterosexual or straight, bisexual, queer, homosexual or gay, not sure/questioning, or other?" Self-report HIV status was assessed by one question "What was the result of your most recent HIV test before today?" For participants who never had HIV test, their HIV status was coded as "unknown." History of incarceration was assessed by asking "have you ever spent at least one night in jail or prison?" If the answer was affirmative, a follow-up question was asked "was this in the past 3 months" for the recent history of incarceration. Mental Health was assessed using Kessler Psychological Distress Scale (K10). Cut-off scores are as follows: 10–15: low or no risk; 16–29: medium risk; 30–50: high risk (Kessler, Andrews, Colpe, et al., 2002).

Data analysis

Baseline data collected between July 2008 – August 2009 among1,482 participants were included for the final analysis in the current study. Multinomial logistic regression models with generalized estimating equations (GEE) were conducted to assess the associations between individual characteristics and substance-use patterns.

GEE were used to account for the clustering from the same study site. Individual characteristics that were associated with substance-use patterns in the bivariate models ($p<0.05$) were entered into a multivariate model. Both study site and race/ethnicity were significantly associated with substance-use patterns in the bivariate models, and sensitivity analyses showed the final inferences did not change by keeping either of these variables in the multivariate model. Therefore, we only kept race/ethnicity in the final model. All analyses were performed using Stata Version 13.0 (College Station, TX).

Results

A total of 1,496 individuals were enrolled in the current study. A final sample of 1,482 individuals without any missing value on the key variables were included in the final analysis. Socio-demographic factors among the total sample are provided in Table 1. Overall, more than half of the sample reported being AAMSM (61%), approximately one-fifth (19%) were 24 years old or younger and about half (54%) had a high school (or GED) education or less. With regard to sexual identity, 64% reported being homosexual/gay/same gender loving and 29% reporting being bisexual. A total of 426 (29%) of participants self-

reported being HIV-positive and 26% reported not knowing their HIV status (Table 1). More than half of participants reported earning an annual income of less than $10,000 and approximately one-fifth (22%) reported not having enough money to pay for rent, food or utilities fairly/very often. Additionally, there was a significant proportion of participants who reported a history of incarceration (52% reported ever being incarcerated) and 22% reported having a moderate or severe psychological distress as measured by the Kessler Psychological Distress Scale (Choi, Paul, Ayala, Boylan, & Gregorich, 2013).

We categorized participants based on substance-use risk categories: no frequent binge drinking or frequent crack/cocaine use; frequent binge drinking only; frequent crack/cocaine use only; frequent binge drinking and frequent crack/cocaine use (Table 1). Over two-thirds of individuals (n=1063, 72%) reported no frequent binge drinking and no frequent crack/cocaine use, 12% (n=181) reported frequent binge drinking only, 11% (n=166) reported frequent crack/cocaine use only and 5% (n=72) reported both frequent binge drinking and frequent crack/cocaine use. Across these risk categories, there were statistically significant differences with respect to race/ethnicity, age, education, employment, income, limited resources (as measured by not having enough money for rent, food or utilities), self-reported HIV status, incarceration (both ever having been incarcerated and having been incarcerated in the previous 3 months) as well as having psychological distress (Table 1). Proportionately, participants in the highest risk category (frequent binge drinking and frequent crack/cocaine use) were most likely to have less education, have insufficient money for rent, food or utilities fairly/very often , have an unstable living environment, self-report being bisexual, have ever been incarcerated or been incarcerated in the previous 3 months and to have a severe mental health disorder.

In order to better assess specific associations between demographics and risk characteristics, we performed adjusted multinomial logistic regression analysis (Table 2). Relative to participants who reported no frequent binge drinking or crack/cocaine use, participants who reported frequent binge drinking only had a greater odds of being African American (adjusted relative risk ratio (aRRR) : 2.19, 95% Confidence Interval (CI): 1.48–3.24), having a unknown or negative HIV status (aRRR: 1.47, 95% CI: 1.30–1.67 and aRRR: 2.67, 95% CI: 1.64–4.36, respectively), having a mild (aRRR: 1.71, 95% CI: 1.11–2.64), moderate (aRRR: 2.68, 95% CI: 1.75–4.10) or severe (aRRR: 2.32, 95% CI: 1.36–3.98) psychological distress. Participants who reported frequent binge drinking were also less likely to have higher formal education (aRRR: 0.61, 95% CI: 0.48–0.76) relative to participants who reported no frequent binge drinking or frequent stimulant use.

Relative to participants who reported no frequent binge drinking or crack/cocaine use, participants who reported frequent crack/cocaine use only had a greater odds of being African American (aRRR: 4.99, 95% CI: 1.93–12.88), being recently (past 3 months) incarcerated (aRRR: 1.63, 95% CI: 1.06–2.52) and having a mild (aRRR: 2.15, 95% CI: 1.49–3.11), moderate (aRRR: 3.36, 95% CI: 2.46–4.58) or severe (aRRR: 2.89, 95% CI: 2.34–3.56) psychological distress Frequent crack/cocaine only participants were less likely to have an income of less than $10,000 per year (aRRR: 0.76, 95% CI: 0.66–0.85) compared with participants who reported no frequent binge drinking or frequent crack/cocaine use.

Participants in the highest risk category (frequent binge drinking and frequent crack/cocaine use) had a greater odds of not having enough money to pay for rent, food or utilities fairly/very often (aRRR: 2.78, 95% CI: 1.84–4.22), being recently (past 3 months) incarcerated (OR: 3.18, 95% CI: 1.91–5.29) and having a mild (aRRR: 3.08, 95% CI: 1.56–6.09), moderate (OR: 2.83, 95% CI: 1.05–7.64) or severe (aRRR: 4.69, 95% CI: 1.66–13.21) psychological distress compared with participants reporting no frequent binge drinking or frequent crack/cocaine use.

Discussion

Overall, our data support the need to examine specific patterns of alcohol and drug use, including their co-occurrence, in studies of MSM populations. Our data suggest that a four category typology correlate with significant differences across sociodemographic characteristics. These findings are consistent with previous reports from Marshall et al., which demonstrated different categories of drinking risk among MSM and that these categories were associated with different demographic characteristics (Paul et al., 2014). Additionally, a recent report from Reback et al. indicated variations in substance-use over time among different populations of MSM (Santos et al., 2013).

Our findings that African American MSM in the sample were more likely to use crack/cocaine or binge drink relative to Latino MSM is consistent with previous studies (Kessler et al., 2002). And, African American MSM who engage in both frequent stimulant use and binge drinking may be at elevated HIV risk associated with sex exchange and recent sexually transmitted infection (Newcomb et al., 2014). However, we did not observe statistically significant differences with respect to race and ethnicity among participants who were in the highest risk category (frequent crack/cocaine use and frequent binge drinking). Thus, an important implication from our study is the need to implement culturally tailored programs and interventions that will address crack/cocaine use and binge drinking among racially and ethnically diverse populations of MSM. Risk-reduction programming and/or screening or brief interventions targeted toward specific MSM populations is particularly important as many MSM who use drugs and/or alcohol do not meet clinical criteria for dependence (Colfax et al., 2004; Irwin & Morgenstern, 2005). Given the high prevalence of non-dependent substance and alcohol use among specific MSM populations, there is a need to develop more culturally tailored brief interventions rather than intensive drug treatment related interventions (Irwin & Morgenstern, 2005). Brief interventions should also emphasize HIV risk reduction, as previous studies suggest that poly-substance-using MSM are much more likely to report unprotected anal intercourse (UAI) and having an STI in the past year (Santos, Coffin, Vittinghoff, et al., 2014).

Study participants in our sample also had a high prevalence of psychological distress (41% overall, 54% and 60% among frequent binge drinker and frequent crack/cocaine users, respectively). Our group has previously reported elevated co-occurrence of psychiatric distress and substance-use disorders among sexual minority men (Yu, Wall, Chiasson, & Hirshfield, 2015). Thus, our data suggest the need to develop specifically tailored interventions that can address not only substance-use but mental health, especially psychological distress, among minority MSM populations. Such interventions may include

specific components that relate to how ethnic and/or racial minority MSM seek (or do not seek) behavioral health treatment in the community, accessibility of culturally appropriate community based treatment providers and how ethnic and racial minority MSM populations internalize psychological distress, thereby placing themselves at higher risk for HIV acquisition and/or transmission due to maladaptive coping mechanisms.

A sizable proportion of our sample (22%) reported financial insecurity. These findings highlight that many minority MSM populations may experience financial hardship which may influence engagement in HIV risk behaviors, including substance use and sexual risk taking. For example, Marshall et al found that consistent hazardous drinking among MSM veterans was associated with financial insecurity (Giwa & Greensmith, 2012). While our analysis did not specifically examine financial insecurity and HIV related risk, our findings may have implications for HIV transmission. For example, Nelson et al found that recent financial crisis among African American MSM was associated with more sexual partners and that MSM who reported recent job loss were more likely to engage in condomless insertive anal intercourse (Marshall et al., 2015b). Mayer et al, found that newly diagnosed African American MSM were more likely be economically disenfranchised (as measured by overall income) (Mayer et al., 2014).

Another finding from our study that individuals who were both frequent crack/cocaine users and binge drinkers had a greater likelihood of recent incarceration (previous 3 months) is consistent with previous reports documenting poly-drug users have a greater risk for experiencing incarceration (Tobin et al., 2015). Often individuals who use substances are at increased risk for incarceration and a significant proportion of substance using MSM are involved with the criminal justice system. Furthermore, among HIV positive MSM, criminal justice involvement may adversely impact receipt of appropriate care in the community. A recent analysis of 1,270 HIV-positive jail detainees revealed that 22% of black participants reported MSM behavior; this same study found that self-identifying as black was associated with a lower likelihood of having an HIV provider prior to incarceration (Center for Disease Control and Prevention (CDC), 2016b). Correctional settings represent an important time to engage high-risk populations, including substance using MSM, in HIV prevention and linkage to treatment interventions. Thus, there is a need to better integrate substance-use and mental health coupled with HIV prevention programming in the criminal justice system, specifically geared toward racial and ethnic minority MSM populations.

Finally, it is important to note that a sizable proportion of the study population reported their HIV status as unknown (26%). Through its National HIV Behavioral Surveillance surevey (NHBS), the CDC found that 25% of gay and bisexual men surveyed in five large U.S. cities were infected with HIV; 48% of those infected were unaware of their status. The NHBS survey has also documented the percentage of HIV positive AAMSM in the Baltimore area who reported that they were unaware of their serostatus as 64% in 2004–5, 77% in 2008 and 71% in 2011 (Center for Disease Control and Prevention (CDC), 2016b). Thus, a crucial part of HIV prevention efforts must include HIV testing among MSM populations.

Several limitations of this study are important to note. Participants were recruited using convenience sampling and participants were at higher risk based on enrollment criteria, and

thus may be unlikely to be representative the MSM community. Additionally, our data are cross-section from baseline assessments only. Therefore, findings may not necessarily be generalized to racial and ethnic minority MSM populations in other cities or rural areas. Despite this limitation, the current study utilized data from a multi-site study, presenting urban cities in the Northeast and Mideast and thus, there is some geographic diversity among the sample population. We focused on recent substance use and therefore our data do not capture changes over time in substance -use related patterns among sample participants. Finally, the study relied on participants' self-reports of their behavior, which are subject to recall and social desirability bias.

Despite these limitations, findings from the current study can inform future research with African American and Latino MSM, particularly with respect to alcohol and crack/cocaine use and design and implementation of culturally tailored risk-reduction interventions. More research is needed to better understand how individual, social and structural factors are interrelated and interact to contribute to the disparities in HIV acquisition and transmission. Culturally competent HIV prevention, testing and treatment programs are urgently needed for racial and ethnic minority MSM populations. In particular, alcohol/drug prevention programs and interventions with diverse populations of MSM, e.g. racial and ethnic minority MSM and young MSM, must take a nuanced approach to understanding levels of risk behavior and co-occurrence of substance usage, and examine potentially different social determinants/correlates of these behaviors. Importantly, analyzing the unique predictors of substance use among specific MSM populations could inform cultural adaptation of HIV prevention interventions among such populations.

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Table 1

Socio-demographic characteristics and Mental Health Status of 1,482 Latino and African-American Men Who Have Sex with men (LAAMP) by Substance-use Patterns in Baltimore, Chicago, greater Milwaukee /greater Detroit region, Miami and New York City (July 2008 – August 2009)

	Total sample (n=1482)	Not frequent binge drinker or frequent crack/ cocaine user (n=1063)	Frequent binge drinker (n=181)	Frequent crack/cocaine user (n=166)	Frequent binger drinker and frequent crack/ cocaine user (n=72)	p-value
Study site:						
New York City (Latino)	363 (24%)	292(28%)	43(24%)	20(12%)	8(11%)	
Chicago	227 (15%)	161(15%)	25(14%)	31(19%)	10(14%)	
Baltimore	188 (13%)	111(10%)	22(12%)	39(23%)	16(22%)	
Greater Milwaukee /greater Detroit region	170 (12%)	114(11%)	30(17%)	17(10%)	9(13%)	
Miami	208 (14%)	159(15%)	28(15%)	5(3%)	16(22%)	
New York City (AA/Black)	326 (22%)	226(21%)	22(18%)	54(33%)	13(18%)	<.001
Race:						
Latino	571(39%)	451(42%)	71(39%)	25(15%)	24(33%)	
AA/Black	911(61%)	612(58%)	110(61%)	141(85%)	48(67%)	<.001
Age:						
<=24	288(19%)	222(21%)	42(23%)	15(9%)	9(13%)	
25–34	292(20%)	221(21%)	40(22%)	20(12%)	11(15%)	
35–44	504(34%)	346(32%)	61(34%)	64(39%)	33(46%)	
>=45	398(27%)	274(26%)	38(21%)	67(40%)	19(26%)	<.001
Education:						
Grade 12 or GED or less	793(54%)	538(51%)	113(62%)	95(57%)	47(65%)	
College, Associate or technical degree or higher	689(46%)	525(49%)	68(38%)	71(43%)	25(35%)	.003
Employment:						
Not working/on disability	887(60%)	606(57%)	103(56%)	133(80%)	45(63%)	
Working full/part time	595(40%)	457(43%)	78(44%)	33(20%)	27(37%)	<.001
Last year income:						

	Total sample (n=1482)	Not frequent binge drinker or frequent crack/ cocaine user (n=1063)	Frequent binge drinker (n=181)	Frequent crack/cocaine user (n=166)	Frequent binger drinker and frequent crack/ cocaine user (n=72)	p-value
Less than $10,000	809(55%)	567(53%)	89(49%)	110(66%)	43(60%)	
$10,000 or more	673(45%)	496(47%)	92(51%)	56(34%)	29(40%)	.005
How often was there not enough money in the household for rent, food or utilities						
Never or Once a while	1162(78%)	864(81%)	136(75%)	124(75%)	38(53%)	
Fairly often or Very often	320(22%)	199(19%)	45(25%)	42(25%)	34(47%)	<.001
Current living arrangement						
House/apartment (own, family member's or some else's)	1273(86%)	917(86%)	163(90%)	135(81%)	58(81%)	
Rooming, boarding, halfway house/shelter/welfare hotel, street or others	209(14%)	146(14%)	18(10%)	31(19%)	14(19%)	0.06
Sexual identity:						
Homosexual/gay/same gender loving	950(64%)	697(66%)	116(64%)	96(58%)	41(57%)	
Heterosexual/straight	47(3%)	27(3%)	8(5%)	7(4%)	5(7%)	
Bisexual	426(29%)	298(28%)	51(28%)	52(31%)	25(35%)	
Queer/not sure/questioning/other	59(4%)	41(4%)	6(3%)	11(7%)	1(1%)	0.128
Self-reported HIV status:						
Positive	426(29%)	285(27%)	38(21%)	79(47%)	25(35%)	
Unknown	394(26%)	277(26%)	54(30%)	46(28%)	17(24%)	
Negative	662(45%)	501(47%)	89(49%)	42(25%)	30(41%)	<.001
Had ever been incarcerated						
No	714(48%)	582(55%)	69(38%)	44(27%)	19(26%)	
Yes	768(52%)	481(45%)	112(62%)	122(73%)	53(74%)	<.001
Have been incarcerated in the past 3 months						
No	1344(91%)	988(93%)	159(88%)	143(86%)	54(75%)	
Yes	138(9%)	75(7%)	22(12%)	23(14%)	18(25%)	<.001
Mental Health						

	Total sample (n=1482)	Not frequent binge drinker or frequent crack/ cocaine user (n=1063)	Frequent binge drinker (n=181)	Frequent crack/cocaine user (n=166)	Frequent binger drinker and frequent crack/ cocaine user (n=72)	p-value
No mental disorder	872(59%)	700(66%)	84(46%)	66(40%)	22(30%)	
Mild mental disorder	279(19%)	181(17%)	39(22%)	39(23%)	20(28%)	
Moderate mental disorder	167(11%)	95(9%)	31(17%)	31(19%)	10(14%)	
Severe mental disorder	164(11%)	87(8%)	27(15%)	30(18%)	20(28%)	<.001

Table 2

Adjusted multinomial logistic regression models for Substance-using Latino and African American MSM

	Frequent binge drinker aRRR (95% CI)	Frequent crack/cocaine user aRRR (95% CI)	Frequent binger drinker and frequent crack/cocaine user aRRR (95% CI)
Age:			
<=24#	1.0	1.0	1.0
25–34	1.09(0.52,2.27)	1.56(0.52,4.63)	1.42(0.34,5.94)
35–44	1.11(0.59,2.11)	3.05(1.03,9.06)*	2.72(0.47,15.84)
>=45	0.88(0.43,1.79)	3.53(0.83,14.91)+	2.11(0.23,18.91)
Race:			
Latino#	1.0	1.0	1.0
African American/Black	2.19(1.48,3.24)***	4.99(1.93,12.88)**	1.85(0.40,8.56)
Education:			
Grade 12 or GED or less#	1.0	1.0	1.0
Some college, Associate or technical degree or higher	0.61(0.48,0.76)***	1.00(0.65,1.53)	0.69(0.33,1.42)
Employment:			
Not working/on disability#	1.0	1.0	1.0
Working full/part time	1.02(0.69,1.52)	0.59(0.33,1.05)+	1.10(0.67,1.80)
Last year income:			
Less than $10,000#	1.0	1.0	1.0
$10,000 or more	1.49(0.99,2.23)+	0.76(0.68,0.85)***	1.03(0.50,2.11)
How often was there not enough money in the household for rent, food or utilities			
Never or Once a while#	1.0	1.0	1.0
Fairly often or Very often	1.22(0.83,1.80)	1.09(0.87,1.37)	2.78(1.84,4.22)***
Self-reported HIV status:			
Positive#	1.0	1.0	1.0
Unknown	1.47(1.30,1.67)***	0.92(0.54,1.56)	0.94(0.67,1.30)
Negative	2.67(1.64,4.36)***	1.74(0.68,4.44)	1.69(0.55,5.22)
Recent incarceration			
No#	1.0	1.0	1.0
Yes	1.51(0.75,3.04)	1.63(1.06,2.52)*	3.18(1.91,5.29)***
Mental Health (Kessler Psychological Distress Scale K10)			
No mental disorder#	1.0	1.0	1.0

	Frequent binge drinker aRRR (95% CI)	**Frequent crack/cocaine user aRRR (95% CI)**	**Frequent binger drinker and frequent crack/cocaine user aRRR (95% CI)**
Mild mental disorder	1.71(1.11,2.64) *	2.15(1.49,3.11) ***	3.08(1.56,6.09) **
Moderate mental disorder	2.68(1.75,4.10) ***	3.36(2.46,4.58) ***	2.83(1.05,7.64) *
Severe mental disorder	2.32(1.36,3.98) **	2.89(2.34,3.56) ***	4.69(1.66,13.21) **

+ p <.10,

* p<.05,

** p<.001,

*** p<.001

reference group