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Prevalence of Substance Use in an HIV Primary Care Safety Net Clinic: A Call for Screening

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Abstract

Substance use complicates HIV care and prevention. Primary care clinics are an ideal setting to screen for and offer interventions for unhealthy alcohol and drug use; however, few HIV clinics routinely screen for substance use. We enrolled 208 clinic patients at an urban underserved HIV primary care clinic. We screened the patients for substance use with the Alcohol, Smoking, and Substance Involvement Score Test (ASSIST) and measured urine toxicology. Of the 168 participants who completed screening, the majority reported tobacco or non-prescribed substance use in the previous 3 months. White men reported significantly more amphetamine-type stimulant

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use compared to African American and Latino men ($p < 0.001$). Implementing standard clinic practice for screening and assessing substance use in HIV primary care clinics is needed.

Keywords

gender; HIV; SBIRT; substance use

Clinical settings offer an opportunity to address substance use (including alcohol, tobacco, and illicit drugs) in persons living with HIV (PLWH). Substance use in PLWH is associated with HIV transmission risk behavior, low antiretroviral therapy (ART) adherence, HIV progression, detectable viral load, and poorer perceived quality of life (Walter & Petry, 2015). Not all substance use that PLWH engage in constitutes an alcohol or substance use disorder; nonetheless, PLWH have reported experiencing physical, social, and psychological harmful effects of substance use. In addition, studies have reported the harms of alcohol, tobacco, and illicit substance use in this population (Gonzalez, Barinas, & O'Cleirigh, 2011). In the general population as well as in PLWH, the consequences of unrecognized and untreated substance use are clinically, socially, and economically significant. The U.S. Public Health Service has endorsed routine and universal alcohol and tobacco screening in primary care (U.S. Preventive Services Task Force, 2004); however, few HIV primary care clinics routinely assess patients for alcohol or other substance use (Surah et al., 2013).

The effects of alcohol, tobacco, and illicit substance use take a greater combined toll on the health and wellbeing of Americans than any other preventable factor. Alcohol and tobacco use are significant risk factors for cardiovascular disease and cancer, which are the leading causes of death (O'Keefe, Bhatti, Bajwa, DiNicolantonio, & Lavie, 2014). In a national survey on substance use (alcohol and illicit drugs) and health, more than 71% of U.S. adults reported alcohol use in the previous year (Substance Abuse and Mental Health Services Administration, 2014). In 2007, substance use contributed to more than half of suicides and violent crimes in the United States (Sacks et al., 2009). The economic cost of the global burden of disease and health care utilization that are attributable to alcohol use are immense (Rehm et al., 2010).

Alcohol, tobacco, and illicit drug use can complicate HIV health care and health outcomes by interfering with medication access and adherence, contributing to HIV pathogenesis, increasing transmission risk behaviors, and destabilizing sources of social and financial support. PLWH who use substances are less likely to be prescribed ART and those on ART have reduced ART adherence (Golin et al., 2002; Volkow & Montaner, 2010). Studies that have enrolled active substance users show mixed results on HIV medication adherence. Historically, studies with PLWH who reported illicit drug use while on ART had poorer health outcomes than those who did not use drugs, (Arnsten et al., 2007) while more current studies of PLWH who injected drugs and were on HIV treatment showed survival rates that were similar when compared to people who injected drugs with those who did not (Spiller, Broz, Wejnert, Nerlander, & Paz-Bailey, 2015). In addition to complicating treatment and HIV outcomes, research has also shown an association between active substance use

(alcohol and illicit drugs) and high-risk HIV transmission behaviors, including unprotected anal and vaginal intercourse with uninfected partners (Kalichman et al., 2009).

Stimulant use by PLWH is also a critical factor in HIV health outcomes. Cocaine use has been shown to enhance viral replication and quiescent T-cell permissiveness to HIV infection, increasing the viral reservoir; cocaine is also an independent factor for unsuppressed viral load and increased neurocognitive disorders (Kim et al., 2015). Methamphetamine use has been associated with primary drug resistance to non-nucleoside reverse transcriptase inhibitors, increased cognitive decline, inflammation in the brain, and ischemic events (Cattie et al., 2014). Methamphetamine use also doubles or triples the probability of engaging in high-risk sexual behavior and acquisition of sexually transmitted infections (STIs) including HIV (Colfax & Shoptaw, 2005). HIV infection is more likely in women who use crack cocaine than in women who don't; suicide attempts for PLWH are more prevalent in persons who use drugs (Walter & Petry, 2015) and are related to poorer emotional and cognitive quality of life measures. Several studies have now demonstrated the relationship between substance use and HIV acquisition and increased morbidity and mortality for PLWH (Kuo et al., 2014).

Screening for substance use and identifying those with risky alcohol and drug use behaviors in primary care settings allows for an integrated approach to respond to harmful substance use. As with many chronic diseases, screening and early detection can serve as a form of preventive care (Saitz et al., 2010) as well as to identify patients where further clinical intervention may be warranted. A study of alcohol and drug use screening is especially relevant in HIV clinical settings, where substance use is widespread (Mimiaga et al., 2015). HIV care providers have the opportunity to identify and intervene with patients who otherwise would be unlikely to access specialty treatment for substance use. Screening and assessment for unhealthy substance use offers clinicians the opportunity to identify harmful substance use or disorders and provides the opportunity to address such use. However, few studies have explored screening for substance use as part of HIV primary care. The goal of our study was to characterize patterns and severity of substance use through two different screening and assessment approaches in a large, urban public HIV clinic providing primary care to PLWH and to describe gender and racial differences in alcohol, tobacco, and other substance use.

Methods

Design: Sample, Setting, and Data Collection

Patients ($N = 208$) were recruited and enrolled in a parent Screening, Brief Intervention, and Referral to Treatment (SBIRT) trial (Dawson Rose et al., 2015). Potential subjects were recruited from a convenience sample of patients receiving HIV primary care at the University of California San Francisco Positive Health Program (PHP) clinic at San Francisco General Hospital. The PHP clinic is one of the oldest and largest HIV clinics in the United States, providing primary medical care to more than 2,500 HIV-infected patients annually. All study protocols were reviewed and approved by the University of California San Francisco Institutional Review Board and the clinical site.

Study eligibility included: 18 years of age or older, confirmed HIV-infected serostatus, ability to provide informed consent to be a research participant and to be followed over a 6-month period, ability to speak English or Spanish, and receiving HIV care at the PHP clinic. We also asked study participants for written consent to abstract biological measures from their electronic health records. Study materials were provided in both English and Spanish.

Study participants completed a self-administered survey upon enrollment to the study. They were asked to submit a urine specimen for drug toxicology screening, although this was not a requirement for study participation. Study participants included in our sub-analysis completed both screening measures. Participants received $35 for completing each study visit and an additional $10 for urine samples provided.

Measures

Demographics—Participants completed a demographic questionnaire that we have used in multiple studies with PLWH. The questionnaire asked about age, gender, race, income adequacy, education, and year of HIV diagnosis (Tyer-Viola et al., 2014).

Substance use screening tools—We used two substance use screening measures in this analysis: the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST; World Health Organization [WHO] ASSIST Working Group, 2002), which is a validated screening tool for unhealthy use, and the Sure-Screen® urine toxicology test. The ASSIST is a low-cost, self-report, 8-item screening questionnaire developed for use in primary care settings to screen for the presence of alcohol and other substance use disorders (Humeniuk et al., 2008; WHO ASSIST Working Group, 2002). ASSIST collects information about lifetime non-medical substance use, previous 3-month substance use, frequency of use, cravings, and problems related to substance use – including health, social, legal, or financial problems; failing to do what was normally expected because of drug use; having someone express concern about a person's drug use; trying and failing to control, cut down, or stop using; risk of current or future harm; level of dependence; and injection drug use. The responses are summed to provide both a continuous Specific Substance Involvement Score (SSIS) and validated cut points for each substance that translate to low, moderate, or high risk use, which indexes the risk for each substance assessed. A moderate SSIS risk score indicates individuals who should be offered a brief intervention or a referral for substance use treatment. A high-risk score indicates a need for more intensive treatment or attention to the substance being used at high-risk levels.

Urine specimens were collected and screened using the 8-panel Sure-Screen® (MEDTOX Scientific, 2015), a rapid qualitative immunoassay screening test for detection of multiple drugs and drug metabolites in human urine. The Medtox 11-panel Sure-Screen® tests for 11 substances at the following cut-off concentrations: amphetamine (d-amphetamine) 300 ng/mL, barbiturates (butalbital) 200 ng/mL, benzodiazepines (nordiazepam) 200 ng/mL, cocaine (benzoylecgonine) 100 ng/mL, methamphetamine (d-methamphetamine) 1000 ng/mL, methadone (methadone) 200 ng/mL, opiates (morphine) 100 ng/mL, oxycodone 100 ng/mL, phencyclidine (phencyclidine) 25 ng/mL, propoxyphene (norpropoxyphene) 300 ng/mL, and cannabinoids (11-nor-9-carboxy-Ä9-THC) 40 ng/mL. We did not conduct

confirmatory testing of positive immunoassay results with gas chromatography/mass spectrometry or liquid chromatography/tandem mass spectrometry.

Clinical measures—CD4+ T cell count and HIV viral load (VL) measurements were extracted from electronic medical records in the hospital database. Using the date of the participants' study visit, the most recent CD4+ T cell count and VL measures in the electronic medical record were retrieved. The clinical site where these data were collected measured VL with the RealTime™ HIV-1 VL assay, which has a lower limit of detection of 70 HIV RNA copies/mL (Arredondo et al., 2012).

Data Analysis

Descriptive statistics, including frequencies, percentages, means, and standard deviations were performed to characterize the sample. Pearson's chi-square and Fischer's exact test analyses were used to determine differences in risk stratification of SSIS scores between male and female genders, and across the four race/ethnicity categories (African American, Hispanic or Latino/a, White/Anglo, and Other) and substances detected via urine toxicology. All analyses were conducted with STATA 14. Urine toxicology screens provide information that will tell if a substance is present in the urine or not, however, urine tests cannot be used for diagnosis of a substance use disorder.

Results

Sample Characteristics

We enrolled 208 HIV primary care clinic patients from an urban public clinic. The analysis presented here is based on the 168 participants who completed both the ASSIST questionnaire and urine drug screening procedure. The participants were primarily male (68.4%); and more than one third (40.5%) were African American (Table 1). There were no significant demographic differences between the entire sample of 208 and the analytic sample of 168. The average age was 45.66 years (SD = 8.45) with an average of 12.40 years living with HIV. The majority (67.2%) of the participants had an undetectable HIV viral load (≤ 75copies/mL).

Alcohol and Substance Use

More than two thirds of the study sample reported using tobacco or other non-prescribed substances in the previous 3 months. Forty-one percent of our participants (n = 65) reported alcohol use for the same time period. As described in the Methods section, we determined Single Substance Involvement Scores (SSIS) for each substance reported and stratified these scores into low (0–3), moderate (4–26), and high risk (27+) for all substances except alcohol (low risk = 0– 10, moderate risk = 11–26, high risk = 27+), following the validated ASSIST scoring guidelines. More than half of our participants' SSIS scores indicated moderate risk for tobacco, (n = 91, 54.2%) and cannabis (n = 88, 52.4%; Table 2). The three drug classes with the greatest number of participants exhibiting high-risk scores were for tobacco (n = 30, 17.8%), cocaine (n = 20, 11.9%), and amphetamine (n = 18, 10.7%). The SSIS for alcohol use indicated that more than one-third of study participants (n = 52) reported a moderate risk level for alcohol and 7.7% (n = 13) had a high-risk score for alcohol use.

When comparing the SSIS score for each substance by gender and race, we observed differences in reported substance use. Compared to females, males in this sample reported greater levels of moderate risk cannabis use ($p = 0.03$) and moderate risk amphetamine use ($p < 0.001$). There were also significant differences for cocaine use with Hispanic or Latino/a participants reporting lower risk use than African American, White/Anglo, or Other race participants ($p = 0.04$). Finally, more African American participants reported low or no risk amphetamine use as compared to Hispanic or Latino/a, White/Anglo, or Other race participants ($p < 0.001$).

More than half of the sample submitted urine specimens that tested positive for cannabis (52.4%), nearly one third (28.6%) tested positive for cocaine, and almost a quarter (24.4%) tested positive for benzodiazepines. Significant gender differences in urine toxicology were also present. Male gender was significantly associated with positive urine toxicology for amphetamine (20.0%, $p < 0.001$) and methamphetamine (25.2, $p < 0.001$). Female gender was significantly associated with positive urine toxicology for cocaine (39.6%, $p = 0.03$), methadone (30.2%, $p < 0.001$), and opiates (28.3%, $p = 0.04$). Significant racial differences were also observed in urine toxicology. Those of Other race or ethnicity screened positive for cannabis use more frequently (77.8%, $p = 0.02$). Both Hispanic or Latino/a participants and White/Anglo participants screened positive for cocaine (18.5% and 16.4% respectively, $p < 0.001$) less frequently. African American race or ethnicity was associated with lower levels of positive urine toxicology for both amphetamine (5.9%, $p = 0.03$) and methamphetamine (7.5%, $p = 0.01$).

Discussion

In this study of patients in an HIV primary care clinic-based urban population, we found high rates of self-reported substance use, which were confirmed by urine toxicology testing. The SSIS risk scores for all substances, excepting inhalants and hallucinogens, demonstrated that moderate and high-risk substance use was highly prevalent in this sample of patients. Reported substance use in this HIV clinic sample was higher than in other studies of both HIV and non-HIV primary care patient samples for most substances reported except for tobacco use. In the United States, approximately 19% of the adult population smokes cigarettes (Centers for Disease & Prevention, 2012). When compared to the U.S. general population, a number of studies have documented considerably higher rates of smoking in PLWH (Lifson & Lando, 2012), which is of grave concern given the now well-documented increased mortality associated with smoking in PLWH due to cardiovascular disease and non-AIDS related cancers (Helleberg et al., 2015; Rasmussen et al., 2015). For other substances such as cannabis, our sample exhibited levels of use similar to other primary care settings (Saitz et al., 2014) where the ASSIST measure was used. However, in another study of an HIV clinic-based sample, the reported use of cannabis was 18% (Skalski et al., 2015), which was considerably lower than what we found in our study.

When examining other substances reported by participants in our study, we saw similarities compared to other clinic samples of HIV-infected and uninfected patients, for example with stimulant use (cocaine, crack cocaine, methamphetamines; Bing et al., 2001; Cook et al., 2008). A large number of participants in our sample reported moderate or higher ASSIST

scores for cocaine (51.2%) and amphetamine-type stimulants (44.6%). There have been a multitude of studies on stimulant use and HIV, ranging from stimulants as a risk factor for HIV transmission and as a method of managing mental health symptoms and the experience of discrimination, to the manner in which they impacted adherence to ART; however, very few of these samples were drawn solely from clinic settings where HIV care was delivered. In the studies that have been conducted in HIV primary care settings, a range of stimulant use has been reported. Skeer et al. (2012) studied HIV-infected men who have sex with men (MSM) in a large primary care setting in Boston, Massachusetts, and reported that 21% of their sample used amphetamines. In an earlier study (Bing et al., 2001) of a nationally representative probability sample of PLWH, 40% of the subjects reported using an illicit drug other than cannabis. In a more recent study of the Women's Interagency HIV Study, investigators did not solely recruit samples from HIV primary clinics; however, nearly one third (28.6%) of the HIV-infected women in the sample reported crack cocaine use within the previous 3 months (Cook et al., 2008).

The participants in our study also reported a high prevalence of moderate-severe SSIS for alcohol (41%). In comparison, the 2013 National Survey on Drug Use and Health determined the national rate of alcohol use disorders was 7% (Substance Abuse and Mental Health Services Administration, 2014), while studies conducted in general outpatient settings site a prevalence of unhealthy alcohol use ranged from 7% to 20% (Saitz, 2005). The methods used in these studies varied, however, and the prevalence of alcohol use in general medical settings was much lower than what we measured in our sample. Alcohol, like other substance use, can complicate HIV care and treatment outcomes and continues to be a major driver of HIV acquisition.

Substance use patterns can differ between women and men. In the literature, many studies of HIV and substance use conducted with MSM have focused on alcohol or amphetamine use (Stahlman, Javanbakht, Stirland, Guerry, & Gorbach, 2013), while studies of HIV-infected women have been more focused on crack cocaine and heroin use (Cook et al., 2008). In our study, we observed gender differences in SSIS scores and in urine toxicology results. Males in our sample had a significantly higher proportion of moderate or high-risk SSIS scores for amphetamine ($p < 0.001$) and for cannabis ($p = 0.02$; Table 2), while women had significantly higher levels of cocaine, methadone, and opiate positive urines when compared to men ($p = 0.03$). This differed from what we observed in the self-report SSIS scores. While women were marginally more likely than men to report moderate or high-risk cocaine use, this difference was not statistically significant. Many studies in the HIV literature have focused on men, MSM, or women and substance use. To our knowledge, however, no studies analyzed gender differences between men and women in an HIV-infected sample. One more general study found that women were more likely to have a substance use disorder combined with other mental illness compared to men; however, there were no gender differences in the presence of a substance use disorder in the absence of mental illness (Fries, Fedock, & Kubiak, 2014).

Urine toxicology in our study looked different from self-report responses using the ASSIST. Urine drug screening is limited (with few exceptions) to the detection of drug use within a few days before the test and, as in most tests, false positives and false negatives as well as

technical problems can occur. Although objective, the use of biomarkers is not without limitation. The literature has indicated that, in some persons who use drugs, self-report, when compared to urine toxicology verifies under reporting of illicit substance use, although it is not known how widespread this is. Also, some clinicians may conduct urine screening as evidence of therapeutic adherence and evidence of use or non-use of illicit drugs. . In our sample, women had more methadone and opiates in their urine when compared with men; however, opiates and methadone are both commonly prescribed in medical settings for both pain management and opiate agonist therapy (Nosyk et al., 2014) and we did not systematically ask participants if they were being prescribed opiates. As reported by Robinson-Papp, Elliott, Simpson, and Morgello (2012), singular reliance on self-reports for implementation of substance use screening and brief interventions has limitations. In addition, more stigmatized drugs, such as cocaine, methamphetamine, or heroin, may be under-reported using self-report but could be documented with urine toxicology tests (Decker et al., 2014). In our study participants were paid for urine testing, which might not happen in a primary care setting, so motivation to provide a urine sample may be different. While we are not advocating urine screening as the initial step for screening in a clinical setting, some clinicians may use it as a tool to work with patients with a history of substance use to validate their reported use and not as a test, which could penalize the patient (Pellico, Gilliam, Lee, & Kerns, 2014). Although substance use levels differed by screening modality in our study, the evidence clearly pointed to high levels of substance use in this HIV clinic sample.

High amounts of reported substance use found in our study and others highlights a critical problem that HIV clinicians may be overlooking and that could be addressed by universal substance use screening. Based on the evidence of efficacy for screening and offering a brief intervention for alcohol and tobacco use, the U.S. Preventive Services Task Force (2004) has recommended universal preventive substance use screening in primary care for adolescents and adults (Saitz et al., 2010). While screening and brief intervention has shown promise for harmful alcohol use and smoking (Pilowsky & Wu, 2012), the efficacy of universal brief intervention for illicit drug use and prescription drug misuse has not been universally recommended for primary care settings (Saitz et al., 2014). However, because of the overwhelming evidence that illicit drug use negatively impacts health, research to determine the efficacy of screening and brief intervention for drug use is ongoing.

SBIRT has emerged as an important model for identifying and addressing substance use problems in health care settings (Madras et al., 2009). Brief intervention approaches are typically delivered on site, and individuals with more severe substance use problems may also be offered referrals to specialized treatment. Brief intervention for non-treatment-seeking samples has strong support in the alcohol literature (Cuijpers, Riper, & Lemmers, 2004; Kaner et al., 2009) and some promising effects have been observed with respect to other substance use (Humeniuk et al., 2012; Ondersma, Svikis, & Schuster, 2007). Substance use screening followed by a brief intervention conducted by an individual trained in motivational interviewing has been extensively examined in adolescents and young adults using drugs and alcohol. These studies have revealed significant reductions in marijuana use (Saitz et al., 2014); decreases in alcohol use, binge drinking, and days of drug use (Winters

& Leitten, 2007); lower alcohol, tobacco, and cannabis use (McCambridge & Strang, 2005); and reductions in illicit drug use (Peterson, Baer, Wells, Ginzler, & Garrett, 2006).

To our knowledge, few studies of SBIRT have been conducted in HIV settings. Cropsey et al. (2013) conducted an SBIRT feasibility and acceptability study in an HIV primary care clinic to address the high rates of smoking by PLWH; the findings of Cropsey's study indicated that SBIRT was feasible and acceptable to staff and patients in the HIV primary care setting. Using SBIRT as an approach for SBIRT was feasible and acceptable for many participants in our study (Dawson Rose et al., 2015). SBIRT has been implemented in HIV settings in the state of Colorado and results are forthcoming (Fischer, 2012). Given the amount of substance use in PLWH and its impact on HIV care engagement (O'Cleirigh, Magidson, Skeer, Mayer, & Safren, 2014), screening and brief intervention in HIV care settings could be a critical component of the HIV care coordination. More investigation is needed to determine how to best implement substance use screening and brief intervention within the workflows of primary care HIV clinics.

Study Limitations

Our sample was recruited from the clinic waiting room and thus represents patients that are engaged in care and may not be representative of the entire clinic. The most current patient demographic data for the clinic indicated that most were male (84.0%); the clinic was racially diverse with 48.3% Caucasian, 24.4%, African American, and 22.6% Hispanic or Latino/a. The demographic report by the clinic also indicated that the HIV exposure category was primarily MSM (66.0%) but also included heterosexual exposure (25.8%) and injection drug use (23.4%). Our study did not collect data on HIV exposure category. Our efforts to oversample women and people of color were successful as demonstrated by our participants, who were 31% women and 68% people of color, both populations that are often underrepresented. In addition, the high mean CD4+ T cell count and high level of viral suppression in our cohort, while typical of this clinic and San Francisco on the whole, was atypical when compared to Gardner's cascade (Gardner, McLees, Steiner, Del Rio, & Burman, 2011), and may have indicated that, despite the prevalence of substance use in our sample, the participants were able to control their use well enough to remain adherent to their HIV regimens. It is also possible that patients were receiving some type of substance use treatment while enrolled in this study, although we did not ask specifically about concurrent treatment. This suggests that the findings might not be widely generalizable to other HIV clinic populations. Another limitation of our study was that, although the current science on screening for substance use recommends using single-item screeners for clinical settings to determine whether further assessment is needed, we did not use a single-item screener to determine the presence of binge drinking. However, we did use a single item question to determine the need to administer the full ASSIST tool. As such, while we can report on moderate- or high-risk alcohol use, we cannot report our samples' response to the single-item screener, most specifically binge drinking, which is an important indicator for further assessment.

Conclusions

Although there is ample evidence that PLWH report unhealthy substance use at higher rates than the U.S. general population and that this use impacts medication adherence and HIV disease progression and can result in increased risks for comorbid conditions, HIV clinical settings are not systematically screening for or addressing substance use in HIV primary care settings. Nurses are strategically placed to promote health and encourage information exchange with patients about the impact of substance use on their health and wellbeing. Further, patients may benefit from a clinical approach that includes a team-based approach to screening and brief intervention in HIV primary clinics. Normalizing substance use screening, similar to routine blood pressure assessment during clinic visits, could be a more integrated component of holistic care. Efforts to educate and train nurses in practice and as part of pre-licensure and primary care programs using the SBIRT model are in progress.

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Key Considerations

- PLWH are continuing to use substances that place them at risk of poor health outcomes.
- Screening can be brief and still identify an individual who uses substances.
- Screening results could offer the nurse and patient with HIV infection an opportunity to discuss the risks of continued use.
- Screening begins a dialogue between nurses and PLWH regarding risk reduction, health promotion, and treatment outcomes.

Table 1

Baseline Demographic Characteristics ($N = 168$)

Variable	*N* or *M*	% or *SD*
Age (*n* = 163)	*M* = 45.66	*SD* = 8.45
Gender		
Male	115	68.4
Female (including 10 transgender females)	53	31.6
Race		
African American/Black	68	40.5
Hispanic/Latino	27	16.1
White/Anglo (non-Hispanic)	55	32.7
Other	18	10.7
Education		
High School, GED, or less	105	62.5
More than high school	63	37.5
Employed		
Yes	26	15.7
No	140	84.3
Income		
Totally inadequate	38	22.6
Barely adequate	103	61.3
Enough	27	16.1
Health Insurance		
Yes	138	82.6
No	29	17.4
Years since HIV diagnosis (*n* = 154)	*M* = 12.40	*SD* = 7.02
Viral Load < 75 copies/mL	111	66.1
CD4+ T Cell Count cells/mm^3 (*n* = 152)	*M* = 514.74	*SD* = 321.86
Tobacco use previous 3 months (*n* = 167)		
Yes	112	67.1
No	55	32.9
Alcohol use previous 3 months (*n* = 164)		
Yes	106	64.6
No	58	35.4
Illicit substance use previous 3 months (*n* = 167)		
Yes	134	80.2
No	33	19.8

Note. M = mean; *SD* = Standard Deviation; GED = Graduate Equivalency Diploma.

Table 2

Specific Substance Involvement Scores Stratified by Risk Level, Gender, and Race ($N = 168$)

Substance	Risk Level	Total Sample *n* (%)	Male *n* = 115 *n* (%)	Female[a] *n* = 53 *n* (%)	*p*-value	African American *n* = 68 *n* (%)	Hispanic/ Latino *n* = 27 *n* (%)	White/ Anglo *n* = 55 *n* (%)	Other *n* = 18 *n* (%)	*p*-value
Tobacco	Low	47 (28.0)	35 (30.4)	12 (22.6)	0.57	21 (30.9)	13 (48.2)	11 (20.0)	2 (11.1)	0.07^
	Moderate	91 (54.2)	60 (52.2)	31 (58.5)		37 (54.4)	11 (40.7)	33 (60.0)	10 (55.6)	
	High	30 (17.8)	20 (17.4)	10 (18.9)		10 (14.7)	3 (11.1)	11 (20.0)	6 (33.3)	
Alcohol[b]	Low	98 (58.3)	65 (56.5)	33 (62.3)	0.47^	40 (58.8)	17 (63.0)	32 (58.2)	9 (50.0)	0.61^
	Moderate	52 (33.9)	39 (33.9)	18 (34.0)		25 (36.8)	7 (25.9)	19 (34.6)	6 (33.3)	
	High	13 (7.7)	11 (9.6)	2 (3.8)		3 (4.4)	3 (11.1)	4 (7.3)	3 (16.7)	
Cannabis	Low	67 (39.9)	38 (33.0)	29 (54.7)	**0.03**^	33 (48.5)	13 (48.2)	13 (23.6)	8 (44.4)	0.08^
	Moderate	88 (52.4)	68 (59.1)	20 (37.7)		30 (44.1)	12 (44.4)	38 (69.1)	8 (44.4)	
	High	13 (7.7)	9 (7.8)	4 (7.6)		5 (7.4)	2 (7.4)	4 (7.3)	2 (11.1)	
Cocaine	Low	82 (48.8)	55 (47.8)	27 (50.9)	0.97^	27 (39.7)	20 (74.1)	24 (43.6)	11 (61.1)	**0.04**^
	Moderate	66 (39.3)	46 (40.0)	20 (37.7)		33 (48.5)	4 (14.8)	23 (41.8)	6 (33.3)	
	High	20 (11.9)	14 (12.2)	6 (11.3)		8 (11.8)	3 (11.1)	8 (14.6)	1 (5.6)	
Amphetamine	Low	93 (55.4)	52 (45.2)	41 (77.4)	**0.00**^	51 (75.0)	13 (48.2)	22 (40.0)	7 (38.9)	**0.00**^
	Moderate	57 (33.9)	46 (40.0)	11 (20.8)		16 (23.5)	11 (40.7)	22 (40.0)	8 (44.4)	
	High	18 (10.7)	17 (14.8)	1 (1.8)		1 (1.5)	3 (11.1)	11 (20.0)	3 (16.7)	
Inhalants	Low	143 (85.1)	95 (82.6)	48 (90.6)	0.48^	60 (88.2)	23 (85.2)	44 (80.0)	16 (88.9)	0.78^
	Moderate	24 (14.3)	19 (16.5)	5 (9.4)		8 (11.8)	4 (14.8)	10 (18.2)	2 (11.1)	
	High	1 (0.6)	1 (0.9)	0 (0.0)		0 (0.0)	0 (0.0)	1 (1.8)	0 (0.0)	
Sedatives	Low	118 (70.2)	77 (67.0)	41 (77.4)	0.48^	53 (77.9)	17 (63.0)	34 (61.8)	14 (77.8)	0.33^
	Moderate	45 (26.8)	34 (29.6)	11 (20.8)		14 (20.6)	8 (29.6)	19 (34.6)	4 (22.2)	
	High	5 (3.0)	4 (3.5)	1 (1.8)		1 (1.5)	2 (7.4)	2 (3.6)	0 (0.0)	
Hallucinogens	Low	148 (88.1)	98 (85.2)	50 (94.3)	0.24^	62 (91.2)	25 (92.6)	44 (80.0)	17 (94.4)	0.29^
	Moderate	17 (10.1)	14 (12.2)	3 (5.7)		5 (7.4)	1 (3.7)	10 (18.2)	1 (5.6)	
	High	3 (1.8)	3 (2.6)	0 (0.0)		1 (1.5)	1 (3.7)	1 (1.8)	0 (0.0)	
Opioids	Low	123 (73.2)	85 (73.9)	38 (71.7)	0.54^	55 (80.9)	22 (81.5)	32 (58.2)	14 (77.8)	0.06^

Substance	Risk Level	Total Sample *n* (%)	Male *n* = 115 *n* (%)	Female[a] *n* = 53 *n* (%)	*p*-value	African American *n* = 68 *n* (%)	Hispanic/ Latino *n* = 27 *n* (%)	White/ Anglo *n* = 55 *n* (%)	Other *n* = 18 *n* (%)	*p*-value
	Moderate	38 (22.6)	24 (20.9)	14 (26.4)		11 (16.2)	3 (11.1)	20 (36.4)	4 (22.2)	
	High	7 (4.2)	6 (5.2)	1 (1.9)		2 (2.9)	2 (7.4)	3 (5.4)	0 (0.0)	

Note.

^ indicates Fisher's Exact test;

[a] including 10 transgender women;

[b] SSIS scores for Alcohol: low (0–10), moderate (11–26), high (27+); for all other substances: low (0–3), moderate (4–26), high (27+).

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Table 3

Substance Use by Urine Toxicology by Gender and Race ($N = 168$)

Substance	Total Sample *n* (%)		Male *n* = 115 *n* (%)		Female[a] *n* = 53 *n* (%)		*p*-value	African American *n* = 68 *n* (%)		Hispanic/ Latino *n* = 27 *n* (%)		White/Anglo *n* = 55 *n* (%)		Other *n* = 18 *n* (%)		*p*-value
Cannabis																
Absent	80	(47.6)	52	(45.2)	28	(52.8)	0.36	41	(60.3)	11	(40.7)	24	(43.6)	4	(22.2)	**0.02**^
Present	88	(52.4)	63	(54.8)	25	(47.2)		27	(49.7)	16	(59.3)	31	(56.4)	14	(77.8)	
Cocaine																
Absent	120	(71.4)	88	(76.5)	32	(60.4)	**0.03**	38	(55.9)	22	(81.5)	46	(83.6)	14	(77.8)	**0.00**^
Present	48	(28.6)	27	(23.5)	21	(39.6)		30	(44.1)	5	(18.5)	9	(16.4)	4	(22.2)	
Amphetamine																
Absent	144	(85.7)	92	(80.0)	52	(98.1)	**0.00**^	64	(94.1)	20	(74.1)	44	(80.0)	16	(88.9)	**0.03**^
Present	24	(14.3)	23	(20.0)	1	(1.9)		4	(5.9)	7	(25.9)	11	(20.0)	2	(11.1)	
Methamphetamie																
Absent	137	(81.6)	86	(74.8)	51	(96.2)	**0.00**^	63	(92.6)	19	(70.4)	42	(76.4)	13	(72.2)	**0.01**^
Present	31	(18.4)	29	(25.2)	2	(3.8)		5	(7.5)	8	(29.6)	13	(23.6)	5	(27.8)	
Benzodiazepines																
Absent	127	(75.6)	90	(78.3)	37	(69.8)	0.24	53	(77.9)	21	(77.8)	38	(69.1)	15	(83.3)	0.60^
Present	41	(24.4)	25	(21.7)	16	(30.2)		15	(22.1)	6	(22.2)	17	(30.9)	3	(16.7)	
Oxycodone																
Absent	145	(86.3)	103	(89.6)	42	(79.2)	0.07	59	(86.8)	25	(92.6)	43	(78.2)	18	(100.0)	0.08^
Present	23	(13.7)	12	(10.4)	11	(20.8)		9	(13.2)	2	(7.4)	12	(21.8)	0	(0.0)	
Methadone																
Absent	139	(82.7)	102	(88.7)	37	(69.8)	**0.00**^	57	(83.8)	23	(85.2)	44	(80.0)	15	(83.3)	0.95^
Present	29	(17.3)	13	(11.3)	16	(30.2)		11	(16.2)	4	(14.8)	11	(20.0)	3	(16.7)	
Opiates																
Absent	136	(81.0)	98	(85.2)	38	(71.7)	**0.04**	54	(79.4)	23	(85.2)	44	(80.0)	15	(83.3)	0.96^
Present	32	(19.0)	17	(14.8)	16	(28.3)		14	(20.6)	4	(14.8)	11	(20.0)	3	(16.7)	

Note.

^ indicates Fisher's Exact test;

a including 10 transgender women.