

Licit and illicit substance use among persons who inject drugs and the association with subsequent suicidal attempt

Andreea Adelina Artenie^a, Julie Bruneau^{a,b,c}, Élise Roy^{d,e}, Geng Zang^a, François Lespérance^{a,f},
Johanne Renaud^g, Joël Tremblay^h, Didier Jutras-Aswad^{a,f}

^a Research Center, Centre Hospitalier de l'Université de Montréal (CHUM), 900 Saint-Denis,
Montréal, QC, Canada H2X 0A9

^b Department of Family and Emergency Medicine, Faculty of Medicine, Université de Montréal,
C.P. 6128, succursale Centre-ville, Montréal, QC, Canada H3C 3J7

^c Department of Family Medicine, Faculty of Medicine, McGill University, 5858 Chemin de la
Côte-des-Neiges, Montréal, QC, Canada H3S 1Z1

^d Addiction Research and Study Program, Faculty of Medicine and Health Sciences, Université
de Sherbrooke, 150 Place Charles-Le Moyne, Longueuil, QC, Canada J4K 0A8

^e Institut National de Santé Publique du Québec, 190 Crémazie E, Montréal, QC, Canada H2P
1E2

^f Department of Psychiatry, Faculty of Medicine, Université de Montréal, C.P. 6128, succursale
Centre-ville, Montréal, QC, Canada H3C 3J7

^g Department of Psychiatry, Faculty of Medicine, McGill University, 1033 Pine Avenue West,
Montréal, QC, Canada H3A 1A1

^h Department of Psychoeducation, Université du Québec à Trois-Rivières, C.P. 500, Trois-
Rivières, QC, Canada G9A 5H7

Contact information (Corresponding author):

Didier Jutras-Aswad, MD, MSc

Research Center, Centre Hospitalier de l'Université de Montréal (CHUM)

Tour Viger

900, Saint-Denis, office R06-444

Montréal, QC, Canada

Phone: +1 (514) 890-8000 Ext.35703

Fax:+1 (514) 412-7320

E-mail: didier.jutras-aswad@umontreal.ca

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ABSTRACT:

Aim: To estimate associations between recent licit and illicit substance use and subsequent suicide attempt among persons who inject drugs (PWID). **Design:** Secondary analysis of longitudinal data from a prospective cohort study of PWID followed bi-annually between 2004 and 2011. **Setting:** Montréal, Canada. **Participants:** Seven-hundred and ninety-seven PWID who reported injection drug use in the previous six months, contributing to a total of 4,460 study visits. The median number of visits per participant was 5 (Interquartile range: 3- 8).

Measurements: An interviewer-administered questionnaire eliciting information on socio-demographic factors, detailed information on substance use patterns and related behaviours, mental health markers and suicide attempt. The primary exposure variables examined were past-month use of alcohol [heavy (≥ 60 drinks); moderate (1-59 drinks); none], sedative-hypnotics, cannabis, cocaine, amphetamine and opioids [regular (≥ 4 days); occasional (1-3 days); none]. The outcome was a binary measure of suicide attempt assessed in reference to the previous six months. **Findings:** In multivariate analyses, a positive association was found among licit substances between heavy alcohol consumption [adjusted odds ratio (AOR): 2.05; 95% confidence interval (CI): 1.12-3.75], regular use of sedative-hypnotics (AOR: 1.89; 95% CI: 1.21–2.95) and subsequent attempted suicide. Among illicit substances, occasional use of cannabis (AOR: 1.84; 95% CI: 1.09-3.13) had a positive association with subsequent suicide attempt. No statistically significant association was found for the remaining substances.

Conclusion: Among persons who inject drugs, use of alcohol, sedative-hypnotics and cannabis, but not cocaine, amphetamine or opioids, appears to be associated with increased likelihood of later attempted suicide.

Introduction

Suicide is a leading cause of mortality worldwide, estimated to account for more than 800,000 deaths each year (1). Substance use is well-documented as being one of the main risk factors, closely following depression and other mood disorders (2, 3). In a landmark empirical review investigation of cohort studies, individuals with alcohol and drug use disorders were found to be nearly 10 and 17 times, respectively, more likely than peers to die of suicide (4).

Among illicit drug-users, suicide is a predominant cause of mortality, accounting for an estimated 1 in 10 deaths (5, 6). Furthermore, studies conducted in the United States (7), Australia (8), Germany (9) and Brazil (10) noted lifetime prevalences of suicide attempt (SA) to be ranging from 20% to nearly 50% in this population. A nonfatal SA is estimated to be one of the most potent predictors of completed suicide (3).

While an abundant literature has documented the high risk of suicidal behaviours among illicit drug users, available evidence leaves considerable uncertainty regarding the association between use of individual substance types and suicidality in this population (11). Studies assessing this relationship have relied mainly upon cross-sectional data, and reported mixed findings. Use of licit substances, including sedative-hypnotic drugs (9, 12) and alcohol (13) has been found to be positively associated with SA in some studies. Conversely, others did not find a significant association between SA and specific types of substances used (14, 15). Fewer investigations have examined this relationship prospectively. In a multi-city study of recently treated drug-users in the United States, individuals who reported primarily cocaine use at treatment entry had three-fold greater odds of indicating an episode of SA at 12-month follow-up (16). In a clinical sample of drug users in Boston, no statistically significant association was found between recent use of a specific substance and risk of SA (7). Only one study has been conducted among people who inject drugs (PWID) (17), despite being a population potentially at

greater risk of suicidal behaviours compared to non-injection drug users (18). In this seven-year study of community-recruited PWID in Vancouver, methamphetamine injection was found to be associated with an 80% increased risk of SA (17), although findings are limited by a lack of control for potentially important confounding factors, such as previous SA and psychiatric co-morbidity (7). Furthermore, although use of multiple substances, including licit and illicit, is common among drug-using populations (19, 20), none of these three studies have concurrently assessed a broad range of commonly used substance types.

More recently, in a longitudinal study conducted by our group to examine the relation between SA and use of specific substance types among PWID in Montréal, the likelihood of reporting an attempt was found to be nearly twofold greater for users of cocaine, amphetamine and sedative-hypnotics (21). Conversely, no statistically significant association was found between SA and use of opioids, cannabis and alcohol. Although this study points toward important markers of suicidal behaviours among PWID, the directionality of the observed associations was not assessed, as substance use and SA, measured at each follow-up visit, were examined in reference to the same time frame. Knowing whether use of specific substances is predictive of greater vulnerability to suicide could help to identify which subgroups of drug users are most at risk, and to inform the development of tailored prevention strategies. Building upon our previous work, the objective of this study, conducted in a sample of PWID recruited and followed longitudinally between 2004 and 2011 in Montréal, Canada, was to estimate the associations between past-month licit and illicit substance use, measured at each study visit, and SA reported in the following six-month period.

Methods

Study design and participants

This study relied upon secondary data collected as part of the Hepatitis Cohort (HEPCO),

a cohort of PWID established in November 2004 in Montréal, to examine determinants of hepatitis C virus (HCV) transmission. A detailed description of the cohort recruitment and follow-up procedures has been published previously (22). In brief, to be eligible for recruitment into HEPCO, participants were required to be current PWID (i.e., to have injected drugs within the previous six months) and to be 18 years of age or older. Participants were a convenience sample of PWID in Montréal, recruited via different strategies, including referrals from community-based programs catering to the needs of PWID and word-of-mouth. At baseline and each six-month follow-up visit, participants completed an extensive interviewer-administered questionnaire, eliciting information on socio-demographic characteristics, detailed information on substance use patterns, and individual and contextual factors often associated with injection drug use. A section of the questionnaire was devoted to assessing global health, including mental health and SA. The interviewers and nurses working on-site offered information and referrals to addiction, mental health or HCV treatment services on a case-by-case basis. A CAD 20.00\$ honorary was offered to all study participants upon completion of the questionnaire, as compensation for their time. Ethical approval for this study was provided through the Ethics Review Board of the Centre Hospitalier de l'Université de Montréal.

Between November 2004 and March 2011, 1,240 PWID were recruited in HEPCO, contributing to a total of 5,621 observations. Only participants with two study visits were eligible for inclusion in the present study. Additionally, as the aim of this investigation was to examine proximal factors associated with subsequent SA, follow-up visits from participants who were temporarily lost to follow-up for more than one year were excluded after this gap period, even if they resumed their participation later on, resulting in the removal of 718 observations (12.8%). Thus, of the 1,240 total participants, 443 were excluded because i) they did not return for a follow-up visit (n= 361), and ii) their first follow-up visit had occurred more than a year after the

initial assessment (n=82).

The present study included a total of 4,460 observations collected from 797 participants. Compared to participants who were excluded from the analyses (n=443), those who were included were slightly younger [median age (interquartile range (IQR))= 38.7 (29.4 - 44.9) versus 39.6 (31.2 – 46.7), $p= 0.034$], less likely to be male (82.0% versus 86.6%, $p= 0.037$) and more likely to use opioids (52.8% versus 45.3%, $p= 0.013$). Distributions of suicide attempt, education and substance use other than opioids were similar between the two groups (data not shown).

Measures

Consistent with previous studies (14, 17, 21), the outcome of interest was a dichotomous measure of having experienced a SA, assessed by the following question: “In the past six months, have you attempted suicide?”. The primary exposure variables were assessed by questioning participants on the types of substances consumed and associated frequency of use in the previous month. Six substance types that are commonly used by PWID were examined and included alcohol, sedative-hypnotic drugs (counting benzodiazepines and barbiturates), cannabis, cocaine, amphetamine and opioids (counting heroin and prescription opioids). As eligible participants must have injected drugs in the previous six months, cocaine, amphetamine and opioids were the primary drugs of abuse in our sample, whereas the remaining substances were typically co-used. The United States Centers for Disease Control and Prevention defines heavy drinking as consuming 15 and 8 drinks or more per week for men and women, respectively (23). Considering that the great majority of our study sample was composed of males (82.0%), heavy drinking was defined as having consumed 60 drinks or more in the past month, and moderate drinking as having consumed from one to 59 drinks. A third category, no alcohol consumption, was also included. Frequency of drug use was classified as regular, occasional or none, based on

the number of days of use in the previous month. In line with the definitions used by the United States Office of National Drug Control Policy (24), regular drug use was defined as having consumed on four days or more in the previous month, and occasional use as having consumed from one to three days over the same time period. Similar definitions have been used previously to describe frequencies of drug use among illicit drug-using populations (7, 25).

Potential confounders included measured variables identified previously as important correlates of SA among drug users (7, 14, 17, 21). Socio-demographic characteristics included age, gender and education. Markers of psychosocial stress potentially associated with SA included identifying with a sexual minority group (gay, lesbian or bisexual versus heterosexual), living in unstable housing conditions and having been incarcerated in the previous six months. Consistent with previous studies (22), unstable housing was defined as living on the street, in shelters or in apartment-hotels rented on a monthly basis, indicating rapid turnover compared to typical 12-month rent–lease accommodation standards in Montréal. Participants were also asked whether they received treatment for anxiety or depression in the previous six months and whether they have ever been diagnosed with a mental disorder. Because information on prior attempted suicide (lifetime) was not recorded in our study, SA measured at the first study visit, with reference to the previous six months, was examined as an indicator of prior attempt. This variable appears to be a good proxy measure for prior SA, as the risk of a repeat attempt is estimated to be highest in the first six months following an index attempt (26, 27). A follow-up time variable indicating number of visits since baseline assessment was also included to control for different follow-up durations among participants.

Statistical analyses

Descriptive statistics were used to characterise the study population at baseline assessment and included frequency distributions for categorical variables, and median and corresponding IQR for the continuous variable age.

The incidence of SA was calculated using the person-time method, and 95% confidence intervals (CI) were estimated using the Poisson distribution. The date of SA was estimated to have occurred at the midpoint between the last visit at which no SA was reported and the visit with the first report of SA. Participants were right censored at the date of their first SA, or at their last study visit if no SA was reported.

Generalized estimating equation (GEE) analyses with a binomial logit link function and autoregressive order 1 covariance structure (28, 29) were used to examine the relationship between substance use and SA throughout the entire 77-month period, while accounting for within-subject correlation as a result of repeated measurements made for participants with multiple assessments. To examine whether substance use was associated with subsequent SA, the outcome variable was selected from the interview immediately following that of the exposure variables. GEE models provide population-averaged estimates of parameters (30). In our study, odds ratios derived from the GEE analyses are interpreted as the averaged odds of reporting a SA for PWID indicating use of a certain substance compared to the averaged odds of reporting a SA for PWID who did not indicate use of that substance.

Univariate GEE analyses were conducted to calculate odds ratios and corresponding 95% CI for the associations between substance use, potential confounding variables and subsequent SA. In order to adjust for possible confounding, two multivariate models were constructed: a full model, including all variables of interest, and a reduced model containing only those that remained associated significantly with SA. Starting with the full model considering all variables, the reduced model was fitted using a backward selection procedure. Using an *a priori*-defined

model building protocol, basic socio-demographic characteristics (age and gender) were retained in the final model. With the exception of age, gender and previous SA, exposure variables were treated as time-dependent, representing their most recent value. For all analyses, *p*-values were two-sided, with $p < 0.05$ used as a criterion for statistical significance. Statistical analyses were performed using SAS 9.3 software (SAS Institute, Cary, NC, USA).

Results

Table 1 presents the characteristics of the 797 PWID forming the study sample at baseline assessment. Their median age was 38.7 (IQR: 29.4 - 44.9) and the majority (82.0%) was male. Approximately two-thirds of participants reported using alcohol and cannabis, and one-third indicated using sedative-hypnotics. Cocaine use was reported by the majority of participating PWID and use of opioids by approximately half. Only a minority indicated using amphetamine. A considerable proportion of participating PWID presented markers of psychosocial stress. For instance, nearly half reported living in unstable housing conditions and one in three had a history of a diagnosed mental disorder. Forty-eight participants (6.0%) reported a SA in the previous six months.

During the 77-month follow-up period, the mean and median number of study visits per participant was 5.6 (standard deviation: 3.3) and 5 (IQR: 3 – 8) respectively. The median time between consecutive visits was 5.9 months (IQR: 5.3 – 6.5). Besides for the SA reported at baseline assessment, a total of 115 SA were reported during follow-up by 70 (8.8%) participants. Among participants who experienced a SA, the median number of SA during follow-up was 1 (IQR: 1 - 2). During 2347.92 person-years of follow-up, a total of 96 first SA events were reported, yielding an overall incidence rate of 4.09 per 100 person-years (95% CI: 3.33 – 4.97).

Results from the GEE analyses of factors associated with SA are presented in Table 2. In univariate analyses, among licit substances, a statistically significant positive association was found between heavy and moderate alcohol consumption, regular and occasional sedative-hypnotics use and subsequent SA. Among illicit substances, only occasional cannabis use had a statistically significant positive association with subsequent SA. In multivariate analyses (reduced model), the positive associations between heavy alcohol consumption [Adjusted odds ratio (AOR): 2.05; 95% CI: 1.12 - 3.75], regular sedative-hypnotics use (AOR: 1.89; 95% CI: 1.21 - 2.95), occasional cannabis use (AOR: 1.84; 95% CI: 1.09 -3.13) and later SA persisted. Other factors that remained independently associated with later SA were prior SA, history of a diagnosed mental disorder and follow-up time.

Discussion

Our study indicates that PWID in Montréal are at high risk of suicidal behaviours. At baseline assessment, 6.0% of participants reported having experienced an episode of SA in the previous six-month period, similar to prevalences reported previously in community samples of PWID in Vancouver (17) and in the United States (14). The incidence of SA was also high, estimated at 4.1 per 100 person-years, slightly higher than the rate reported among PWID in Vancouver (2.5 per 100 person-years) (17). The main finding of our study is that recent use of alcohol, sedative-hypnotics and cannabis is, by and large, associated with subsequent SA among PWID. Conversely, use of cocaine, amphetamine or opioids is not associated with later SA.

Among illicit drug-using populations, including PWID, use alcohol, sedative-hypnotic drugs and cannabis is typically nested in a broader pattern of polysubstance use involving hard drugs, notably cocaine, amphetamine and opioids, which are generally the primary drugs of abuse. Our findings suggest that use of primary drugs may not play a direct role in shaping

vulnerability to subsequent SA in this population. Rather, suicidal behaviours appear to be closely linked with substances that are typically co-used alongside primary drugs. To our knowledge, this study is the first to examine prospectively the temporal relationship between a broad range of commonly used substance types and SA in a population of illicit drug users. Differences in findings with respect to our previous study (21), which reported a positive association between use of cocaine, amphetamine and SA, could suggest that PWID who engage in suicidal behaviours turn to stimulants to escape feelings of anhedonia or depression (31). It is also possible that this association is mediated by factors that are associated with both stimulant use and SA, such as impulsivity (32, 33).

The direct physiologic and behavioural effects of alcohol, sedative-hypnotics and cannabis, particularly if used in the context of polysubstance use, are likely to account for our findings. Alcohol dependence and associated psychiatric comorbidity has been proposed to act as a distal risk factor for suicidal behaviours, elevating susceptibility over time (34). Moreover, alcohol intoxication can lead to increased impulsivity and depressive thoughts, enhanced behavioural disinhibition and narrowed attention, thereby also acting as a proximal risk factor for suicidality (34). Paradoxically, the use of sedative-hypnotic drugs, particularly benzodiazepines, has also been reported to induce depressive thoughts and enhance behavioural disinhibition in certain individuals (5-10%), leading to increased vulnerability to taking action on suicidal thoughts (35, 36). Although cannabis has been associated with increased suicidal behaviours in some studies, meaningful evidence supporting this association is currently lacking, as is knowledge of the potential mechanisms that may underlie it (37). Further research examining the role of cannabis use in relation to suicidal behaviours is needed.

The greater odds of reporting a SA among participants indicating use of alcohol, sedative-hypnotic drugs and cannabis may also be reflective of a sub-group of PWID who is

experiencing greater psychological distress and is therefore, more susceptible to suicidal behaviours. Use of these drugs may be an attempt at self-medication (38, 39). Although, in our analyses, we accounted for the presence of a diagnosed mental disorder and recent treatment for anxiety or depression, PWID could be self-medicating conditions that have never received medical attention.

Although alcohol, benzodiazepines and cannabis are frequently co-used among street-based illicit drug users, these substances do not typically make up a predominant focus of prevention messages in this group, as their associated problems may be considered secondary to those engendered by the use of hard drugs. However, aside for the evidence implicating use of these soft drugs and of alcohol in suicidal behaviours, their use has been linked previously with risky injection and sexual practices (40, 41), unintentional overdose (42), relapse to drug use (43) and accelerated course of chronic Hepatitis C development among HCV-infected drug users (44). These findings highlight a need to systematically screen for, and address the use of such substances among PWID. Although limited, research has indicated that relatively simple interventions, such as brief motivational counselling, can have positive impacts on patterns of alcohol use among PWID (45). Similar models could be employed to address the use of sedative-hypnotics and cannabis.

As reported previously (7, 16), a prior SA was a strong correlate of later attempt in our study. In addition, a history of a mental disorder was independently associated with subsequent SA, similar to findings reported in prior studies of drug-using populations (7, 12). PWID frequently experience psychological distress and mental health problems (46). Nearly one third of participants in our study reported a history of a diagnosed mental disorder. Altogether, these findings further support the need for enhanced linkage between addiction treatment, mental

health and community-based programs in order to promote timely identification, assessment and management of PWID at risk of engaging in suicidal behaviours.

Our study presents a number of limitations. As with most studies involving illicit drug-using populations, the HEPCO cohort is not a random sample, thereby limiting the generalisability of our findings. However, aside for being fairly older, the socio-demographic and substance use characteristics of participants are, by and large, reflective of the PWID population in Québec (47). Even though our follow-up rate is high for a drug-using population and few differences were found between participants who did and did not return for a follow-up assessment, it is possible that our data may have been influenced by losses to follow-up.

As this investigation relied on self-reported data, findings are subject to social desirability bias, although self-reported data collected from drug-using populations appear to be generally valid (48). Information on prior SA (lifetime) and other factors possibly linked to SA such as stressful life events and family history of suicide (49) was not collected, making residual confounding of our findings a possibility. However, we attempted to address the former limitation by considering SA reported at baseline assessment as a proxy measure of prior SA. Additionally, details regarding the methods used to attempt suicide were not measured, thus limiting our ability to examine associations between substance use and different types of SA. Although different frequencies of substance use were examined in order to distinguish between different severities of substance use, this study did not measure alcohol and drug disorders based on criteria from the Diagnostic and Statistical Manual of Mental Disorders, which may be more strongly associated with SA compared to substance use. On a similar note, while our analyses controlled for markers of psychological distress, mental health was not assessed using validated instruments. Lastly, given the observational nature of our study, causal inferences regarding the association between substance use and SA cannot be drawn. Although our methodological

approach, modelling SA as a time-lagged outcome, attempts to tease out the direction of the association, a reverse association between substance use and SA cannot be ruled completely out, nor can a bidirectional relation (50).

Notwithstanding these limitations, our study provides important insights regarding the relationship between recent licit and illicit substance use and subsequent SA among PWID. Findings suggest that, use of alcohol, sedative-hypnotics and cannabis, substances that are typically co-used among illicit drug-users, are associated with increased odds of reporting a later SA. Although additional research is needed to understand the nature of these associations, findings highlight the importance of addressing use of alcohol and soft drugs as part of suicide prevention efforts among PWID.

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Table 1: Baseline characteristics of 797 people who inject drugs recruited between November 2004 and March 2011 in the HEPCO cohort in Montréal, Canada

Characteristic	Category	n (%)
Age	Median (IQR)	38.7 (29.4 – 44.9)
Gender	Male	653 (82.0)
	Female	143 (18.0)
Completed high-school education	Yes	475 (59.7)
	No	321 (40.3)
Alcohol use ⁺	Heavy	259 (32.8)
	Moderate	314 (39.8)
	None	216 (27.4)
Sedative-hypnotics use ⁺	Regular	186 (23.8)
	Occasional	83 (10.6)
	None	514 (65.6)
Cannabis use ⁺	Regular	420 (53.3)
	Occasional	109 (13.8)
	None	259 (32.9)
Cocaine use ⁺	Regular	472 (60.8)
	Occasional	151 (19.5)
	None	153 (19.7)
Amphetamine use ⁺	Regular	21 (2.7)
	Occasional	44 (5.6)
	None	720 (91.7)
Opioids use ⁺	Regular	317 (40.7)
	Occasional	94 (12.1)
	None	368 (47.2)
Cocaine injection ⁺	Yes	542 (68.3)
	No	251 (31.7)
Amphetamine injection ⁺	Yes	7 (0.9)
	No	790 (99.1)
Opioids injection ⁺	Yes	374 (47.0)
	No	422 (53.0)
Sexual orientation ⁺	LGB	100 (12.7)
	Heterosexual	690 (87.3)
Unstable housing ⁺⁺	Yes	333 (41.8)
	No	463 (58.2)
Incarceration ⁺⁺	Yes	173 (21.8)
	No	621 (78.2)
Treatment for anxiety or depression ⁺⁺	Yes	212 (26.6)
	No	585 (73.4)
History of a diagnosed mental disorder	Yes	249 (31.3)
	No	546 (68.7)
Suicide attempt ⁺⁺	Yes	48 (6.0)
	No	749 (94.0)

Abbreviations: IQR, interquartile range; LGB, lesbian, gay or bisexual

⁺Denotes activity in the past month; ⁺⁺Denotes activity in the past six months

Table 2: Generalized estimating equation analyses of factors associated with suicide attempt among 797 people who inject drugs participating in a prospective cohort in Montréal, Canada, between November 2004 and March 2011 (N=4,460 observations)

Characteristic	Category	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	
			Full model	Reduced model
Age	5-year increase	0.91 (0.79 - 1.06)	0.90 (0.76 - 1.08)	0.94 (0.79 - 1.11)
Gender	Male	0.42 (0.23 - 0.76)**	0.66 (0.31 - 1.40)	0.59 (0.31 - 1.13)
	Female	Ref	Ref	Ref
Completed high-school education	Yes	0.97 (0.61 - 1.54)	0.88 (0.53 - 1.44)	
	No	Ref	Ref	
Alcohol use ⁺	Heavy	2.33 (1.27 - 4.29)**	2.19 (1.16 - 4.13)*	2.05 (1.12 - 3.75)*
	Moderate	1.74 (1.02 - 2.95)*	1.50 (0.87 - 2.59)	1.60 (0.94 - 2.72)
	None	Ref	Ref	
Sedative-hypnotics use ⁺	Regular	2.62 (1.70 - 4.03)**	1.71 (1.03 - 2.82)*	1.89 (1.21 - 2.95)**
	Occasional	2.15 (1.21 - 3.80)**	1.62 (0.86 - 3.04)	1.60 (0.85 - 2.98)
	None	Ref	Ref	
Cannabis use ⁺	Regular	1.20 (0.73 - 1.98)	1.16 (0.68 - 1.96)	1.17 (0.68 - 1.99)
	Occasional	1.90 (1.17 - 3.07)**	2.04 (1.21 - 3.45)**	1.84 (1.09 - 3.13)*
	None	Ref	Ref	
Cocaine use ⁺	Regular	1.10 (0.67 - 1.81)	0.91 (0.52 - 1.60)	
	Occasional	1.09 (0.62 - 1.93)	1.08 (0.58 - 2.00)	
	None	Ref	Ref	
Amphetamine use ⁺	Regular	1.12 (0.42 - 3.01)	0.63 (0.16 - 2.41)	
	Occasional	0.31 (0.06 - 1.54)	0.25 (0.06 - 1.10)	
	None	Ref	Ref	
Opioids use ⁺	Regular	1.13 (0.72 - 1.75)	0.86 (0.52 - 1.42)	
	Occasional	1.13 (0.61 - 2.08)	0.91 (0.46 - 1.81)	
	None	Ref	Ref	
Sexual orientation	LGB	2.30 (1.14 - 4.64)*	1.19 (0.51 - 2.75)	
	Heterosexual	Ref	Ref	
Unstable housing ⁺⁺	Yes	0.87 (0.56 - 1.34)	0.88 (0.52 - 1.48)	
	No	Ref	Ref	
Incarceration ⁺⁺	Yes	0.84 (0.49 - 1.44)	1.09 (0.64 - 1.88)	
	No	Ref	Ref	
Treatment for anxiety or depression ⁺⁺	Yes	2.23 (1.36 - 3.63)**	1.35 (0.78 - 2.32)	
	No	Ref	Ref	
History of a diagnosed mental disorder	Yes	2.73 (1.70 - 4.39)**	1.75 (1.01 - 3.04)*	1.87 (1.10 - 3.19)*
	No	Ref	Ref	Ref
Prior suicide attempt ^a	Yes	9.28 (4.98 - 17.28)**	6.98 (3.71 - 13.16)**	7.43 (3.99 - 13.86)**
	No	Ref	Ref	Ref

Follow-up time	1-visit increase	0.87 (0.80 - 0.95)**	0.89 (0.80 - 0.98)*	0.88 (0.79 - 0.97)**
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Abbreviations: OR, odds ratio; CI, confidence interval; LGB, lesbian, gay or bisexual

⁺Denotes activity in the past month; ⁺⁺Denotes activity in the past six months