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Associations between medical cannabis and other drug use among unstably housed women

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Abstract

Background—Several studies suggest that U.S. state-level legalization of cannabis for medical purposes may be associated with reductions in opioid use; yet its relationship with stimulant use, particularly in high-risk populations like unstably housed women, has received less attention. The purpose of this study was to estimate independent associations between medical and non-medical use of cannabis and use of stimulants and opioids among unstably housed women.

Methods—Cross-sectional data were analyzed from 245 women in the SHADOW study, a community based cohort in San Francisco, CA, in which HIV+ women were oversampled (126 HIV+ and 119 HIV-).

Results—Compared to no cannabis use in the past 6 months (51%), non-medical cannabis use (28%) was associated with a higher adjusted odds of using stimulants (Adjusted Odds Ratio [AOR] = 4.34, 95% confidence interval [CI]: 2.17-8.70) and opioids (AOR = 3.81, 95% CI: 1.78-8.15). Compared to no cannabis use, medical cannabis use (21%) was not significantly associated with stimulant or opioid use. Compared to non-medical cannabis use, however, medical cannabis use was associated with lower adjusted odds of using stimulants (AOR = 0.42, 95% CI: 0.18-0.96). These associations were not modified by HIV status.

Conclusions—Associations between use of cannabis and “street drugs” depend on whether the cannabis is obtained through a medical context. Interventions, research, and policy considering the influence of cannabis on the use of other drugs may benefit by distinguishing between medical and non-medical cannabis use.

Keywords

medical cannabis; cannabis; unstably housed; women; stimulant; opioid

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Introduction

Homeless and unstably housed populations have elevated rates of substance use and dependence, which have been linked to poor physical and emotional health status (Grinman et al., 2010; Riley et al., 2011; Stringfellow et al., 2016). Two of the most commonly used illicit substances by homeless populations in North America are crack cocaine and cannabis (Edens, Mares, & Rosenheck, 2011; Grinman et al., 2010; Riley et al., 2015; Stringfellow et al., 2016; Torchalla, Strehlau, Li, & Krausz, 2011; Tucker et al., 2005). The use of stimulants (cocaine, crack cocaine, methamphetamine) is linked to risky sexual activity (e.g., unprotected sex, sex exchange, multiple sexual partners) and drug use practices (e.g., injecting, drug use before sex) that are associated with HIV transmission (Neblett, Davey-Rothwell, Chander, & Latkin, 2011; Torchalla et al., 2011), and may contribute to overdose (Bauer, Brody, Leon, & Baggett, 2016; Riley, Cohen, & Shumway, 2013). While overdose is often considered to be primarily related to opioid use, we recently reported that cocaine overdose is the leading cause of death among homeless and unstably housed women living in San Francisco (Riley et al., 2013), where the use of crack cocaine is self-reported by almost half of the population (Riley et al., 2014) and urine toxicology confirms cocaine use among 63% of the population (Riley et al., 2016). While use and dependence of one drug is often correlated with use and dependence on another, especially for cocaine (Bierut, Strickland, Thompson, Afful, & Cottler, 2008; Narvaez et al., 2014), less is known about the relationship between stimulant and cannabis use in a legal context that permits the medical use of cannabis.

A growing body of literature suggests that legalization of medical cannabis use may be associated with reductions in prevalence of opioid use reported at the U.S. state level (Bachhuber, Saloner, Cunningham, & Barry, 2014; Boehnke, Litinas, & Clauw, 2016; Kim et al., 2016). In addition, cannabis use may be associated with reductions in opioid use among individuals in states with legal medical cannabis, possibly due to the pain relieving effects of cannabis (Kral et al., 2015; Peters, 2013). While fewer studies have been conducted that focus on stimulants, researchers in Canada recently reported that intentional cannabis use to reduce crack cocaine use was associated with subsequent decreased frequency of crack cocaine use among people who use drugs in Vancouver, Canada (Socias et al., 2017).

Medical use of cannabis has been legal in California since 1996 and is now legal in 29 U.S. states as well as the District of Columbia. Specific legal measures (popular vote or legislative action) and qualifying medical conditions vary from state to state. Under California State law enacted during the study period, individuals who obtained a written recommendation for cannabis use from a physician could obtain, grow, or use cannabis. Recent research suggests that medical use of cannabis relieves chronic pain, HIV-related symptoms (e.g. pain, nausea, loss of appetite), and conditions including post-traumatic stress disorder (PTSD) symptoms (D'Souza et al., 2012; Ellis et al., 2009; Greer, Grob, & Halberstadt, 2014; Hill, 2015; Lynch & Ware, 2015; Whiting et al., 2015; Woolridge et al., 2005). However, ongoing concerns about cannabis use by adults include increased risk of accidental injury after acute use and increased risk of dependence and impaired respiratory function following longer term use (Hall, 2009). While studies have examined and found

differences in substance use behaviors, health conditions, and demographics between medical and non-medical cannabis use in the United States among primary care patients (Roy-Byrne et al., 2015), emergency department patients (Woodruff & Shillington, 2016), young adults (Lankenau, Ataiants, et al., 2017; Lankenau, Fedorova, et al., 2017), and the general population (Choi, DiNitto, & Marti, 2017; Lin, Ilgen, Jannausch, & Bohnert, 2016), such differences have not been examined in older adult populations experiencing a high burden of unstable housing and poor health, and who also report high levels of polydrug use.

Our prior work showed that the risk of incident stimulant use among unstably housed women who did not use at baseline was increased by homelessness, violence, and simultaneous use of un-prescribed opioid painkillers (Riley et al., 2015), but that work did not consider the role of cannabis use. The objective of this analysis was to estimate independent associations between cannabis use context (medical use and non-medical use) and "street drug" use (stimulant use and opioid use) among unstably housed women living with and at risk for HIV. We hypothesized a positive association between non-medical cannabis use (compared to no use) and stimulant and opioid use but a negative association between medical cannabis use (compared non-medical use) and stimulant and opioid use.

Methods

Study Population

Data for this analysis come from the "Shelter, Health, and Drug Outcomes among Women" cohort study (Riley et al., 2014). Biological women were recruited from free meal programs, homeless shelters, and a probability sample of single room occupancy (SRO) hotels in San Francisco, CA, from 2008-2010 and followed biannually for three years. Those who had a history of housing instability and were 18 years or older were eligible for study participation. At baseline, 49% reported sleeping on the street or in a shelter in the past 6 months (Tsai, Weiser, Dilworth, Shumway, & Riley, 2015). HIV testing occurred during study screening and HIV-infected women were oversampled to address HIV specific aims. Informed consent procedures were followed, which included a baseline interview in which participants were asked to restate their understanding of voluntary participation. At their fourth biannual, or 18 month, study visit (2010-2012), participants completed a follow up survey that included assessment of physician recommended cannabis use. Reimbursement of $15 USD was given for each study interview. Study procedures were approved by the Institutional Review Board of the University of California, San Francisco.

Measures

Surveys were administered to participants by trained interviewers in a private setting. Survey questions were pilot tested before baseline assessment to ensure appropriateness with this population. Drug use questions were asked using Audio Computer-Assisted Self-Interviews (ACASI), where participants listened to questions with headphones in private and entered responses into a computer. All measures were in regard to the 6-month time period prior to the interview, which allowed time for variation in housing status, drug use and health outcomes over time, and comparability with other community based studies of drug use.

Primary outcomes

The main outcome measures for the current study were self-reported past 6-month use of stimulants (crack cocaine, powdered cocaine, amphetamine or methamphetamine [“crystal, speed, crank, glass or ice”]) and of opioids (heroin or un-prescribed opioid painkillers, phrased as “painkillers that weren’t prescribed for you, such as Oxycontin, Vicodin, morphine or other opioid painkillers”).

Primary exposure variable

A three-level indicator variable, specifying no cannabis use (reference category), medical cannabis use, and non-medical cannabis use, was derived from frequency of cannabis use (using local terms “marijuana” and “pot”) in the past 6 months, and whether the participant had a “prescription” for medical cannabis (“Do you currently have a prescription for medical marijuana?”) At the time of interviews, a recommendation for cannabis use under California State law would have necessitated a physician’s recommendation letter to buy cannabis at a dispensary for up to one year. The term “prescription” was chosen based on pilot studies in the same population, indicating that the term was understood as a written recommendation from a doctor. Furthermore, this definition of medical vs. non-medical use mirrors that used by the National Survey on Drug Use and Health to assess non-medical use of prescription opioids (SAMSHA, 2013).

Covariate variables

Secondary exposures included factors previously reported to be associated with stimulant and opioid use in low income populations, including social determinants of health, health status, and experience of violence (Riley et al., 2015). Social determinants of health included race and ethnicity, recent homelessness, age, completion of high school, monthly income, and unmet subsistence needs. Race and ethnicity were self-reported and then dichotomized for this analysis into White vs. non-White, though sensitivity analyses were conducted to determine whether there were differences across other racial/ethnic groups (African-American, Asian/Pacific Islander, Hispanic or Latina). Recent homelessness was defined by whether the participant reported sleeping in a shelter or public place in the past 6 months. Monthly income was dichotomized into greater or equal to vs. less than the population median monthly income. Unmet subsistence needs included insufficient access to food, clothing, a restroom, a place to wash, or a place to sleep (Gelberg, Gallagher, Andersen, & Koegel, 1997).

Health conditions included HIV, chronic health conditions, and general health. HIV status was determined through antibody testing. Having at least one chronic health condition was determined by participant self-report of experiencing or receiving care in the past 6 months for heart disease, emphysema, asthma, hypertension, or diabetes. Physical and mental health summary (component) scores were assessed with the Short Form (SF)-12 questionnaires (range: 0-100), with higher scores indicating better health (Larson, 2002). The SF-12 physical health questionnaire covers domains of physical functioning, physical role functioning, bodily pain, and general health. One question from the SF-12 physical health questionnaire, “how much did pain interfered with your daily activities?” was examined separately. The SF-12 mental health question covers domains of vitality, social functioning,

emotional role functioning, and mental health. Physical, sexual, and emotional violence was assessed using questions based on the Severity of Violence against Women Scales (Marshall, 1992), which have been previously tested in this population (Riley et al., 2014). Physical violence included being hit, slapped, kicked, bitten, chocked, shot, stabbed, or struck with an object. Sexual violence included being forced to have sex of any kind. Emotional violence included experiencing threats, harassment, cruelty, aggression, harm to another person, or loss of property from malicious intent.

Data analysis

Chi-square tests and ANOVA were used to compare study factors by the primary exposure, cannabis use category. Unadjusted and adjusted associations were estimated with logistic regression. Two logistic regression models estimated associations between exposures of interest and two outcome variables, (1) stimulant use or (2) opioid use. Because pain interference with daily activities was highly correlated with the SF-12 physical health score (r=−.66), only pain interference was included in models as chronic pain is a specific indication for medical cannabis.

Adjusted analysis was based on multivariable logistic regression. As the primary exposure of interest, it was decided a priori that cannabis use category would be retained in all models. Following Hosmer and Lemeshow recommendations (Hosmer Jr, Lemeshow, & Sturdivant, 2013), all other variables associated with the respective outcome at a level of significance where p<.25 were included in the multivariable model. Variables were removed by largest p-value until all variables had a p-value of <.1. Because HIV is one of the primary qualifying conditions for receiving a medical cannabis recommendation and we over-sampled HIV-infected women to meet the original study aims, HIV status was also tested as an effect modifier by assessing the significance of an HIV by cannabis use interaction.

Results

Participant characteristics

Among 300 study participants recruited at baseline, 245 had data available for the follow up time period of interest. Compared to the baseline sample, there were no significant differences among participants included in this sample with regard to use of stimulants, opioids, or cannabis, or to HIV status. However, those who returned at their 18 month visit were significantly less likely to have been homeless at baseline (p=.007).

Of the 245 participants, most were women of color (45% African American, 5% Latina, 3% Asian/Pacific Islander, 16% other), the average age was 47.5 years, 18% had slept in a shelter or public place in the past 6 months, and 33% reported any unmet subsistence needs in the past 6 months (Table 1). In accordance with the original study design and over-sampling HIV-infected individuals, half of study participants were HIV-infected (51%). Half had at least one chronic physical health condition other than HIV (51%). Overall health status scores were approximately 10% lower than the general population, indicating worse health (i.e., average SF-12 mental and physical health scores in the general population are

both 50 out of 100, while they were 39.1 for physical health and 42.5 for mental health in the current study).

About half the women (48%) reported using cannabis in the prior 6 months; of these about 40% (n = 52) had a medical cannabis recommendation (21% of the full sample). The cannabis groups were comparable, except with regard to homelessness, HIV status, and mental health status (Table 1). Most notably, women in the medical cannabis group had the lowest prevalence of recent homelessness, the highest HIV prevalence, and higher mental health status scores than women in the non-medical cannabis group. Almost half of study participants reported stimulant use (49%), with crack cocaine (40%) being the most commonly used stimulant, followed by methamphetamine (13%), and powder cocaine (8%). Opioid use was less commonly reported (19%), with the majority of participants reporting un-prescribed use of opioid painkillers (13%) followed by heroin use (9%). There was also substantial overlap between stimulant and opioid use, with 16% reporting use of both (33% of those who used stimulants reported using opioids and 85% of those who used opioids reported using stimulants). Significant differences were found across no use of cannabis, medical cannabis use, and non-medical cannabis use for use of both stimulants ($p<0.001$) and opioids ($p=0.003$), with increasing prevalence across these three categories ($p<0.001$).

In a sub-analysis of frequency of use, women who used medical cannabis were more likely to report daily cannabis use (63%) than women who used cannabis non-medically (16%). In examining daily use of crack (n=26) (the most commonly used stimulant), prevalence was highest among women who used cannabis non-medically (n=14, 20%), followed by women who did not use cannabis (n=10, 8%), and then women who used cannabis medically (n=2, 4%). There were only 7 participants who reported daily use of heroin and 8 who reported daily use of opioid painkillers.

Correlates of stimulant use

In unadjusted analyses, compared to no use of cannabis, non-medical use of cannabis was associated with a higher unadjusted odds of using stimulants (OR = 5.14, 95% CI: 2.69-9.80), while use of medical cannabis did not differ significantly from no use (OR = 1.81, 95% CI: 0.94-3.50) [Table 2]. Compared to non-medical cannabis use, use of medical cannabis was associated with lower odds of using stimulants (OR = 0.36, 95% CI: 0.17-0.75). In unadjusted analysis, the odds of stimulant use were three times higher among women who experienced recent homelessness (OR=3.19, 95% CI: 1.58-6.46) or emotional violence (OR=3.08, 95% CI: 1.82-5.22), two times higher among women who experienced recent physical violence (OR = 2.33, 95% CI: 1.15-4.71), and odds decreased as mental health scores increased (OR=.96, 95% CI: .94–.98).

Similar results were obtained in adjusted analysis, with the exception that physical violence was no longer significantly associated with stimulant use, and white race/ethnicity was negatively associated with stimulant use. [Table 2]

Correlates of opioid use

In unadjusted analysis, the only factor significantly associated with opioid use was non-medical cannabis use. Non-medical use of cannabis was associated with a higher odds of

using opioids (OR = 3.40, 95% CI: 1.62-7.13) compared no use of cannabis, but the odds of opioid use did not significantly differ when comparing medical cannabis use to no cannabis use (OR = 1.52, 95% CI: 0.62-3.74) [Table 2].

In adjusted analyses, non-medical cannabis use maintained similar significance and magnitude of association with opioid use, and completion of high school also became significantly (and negatively) associated with opioid use (AOR: 0.50, 95% CI: 0.25-0.98). [Table 2]

Interaction terms between cannabis use category and HIV status, mental health status, or homelessness were not significant for either stimulant use or opioid use ($p>.05$).

Discussion

In this study of unstably housed women living in San Francisco, we found differential associations between medical and non-medical cannabis use with respect to the use of stimulants. Specifically, the odds of stimulant use were lower among women who used cannabis medically when compared to those who used cannabis non-medically. Additionally, non-medical cannabis use increased the odds of stimulant use when compared to no cannabis use, while medical cannabis use did not increase the odds of stimulant use. These results corroborate study hypotheses and are consistent with prior research showing that medical cannabis use is associated with lower levels of non-cannabis drug use among housed U.S. adults living in states with medical cannabis laws from the National Survey on Drug Use and Health (Lin et al., 2016), as well as research showing a lower frequency of drug problems among emergency department patients in California (Woodruff & Shillington, 2016), and lower level drug problem severity among primary care patients in Washington State (Roy-Byrne et al., 2015). Research among housed U.S. adults from the National Epidemiological Survey on Alcohol and Related Conditions found that medical cannabis use is associated with lower rates of alcohol use disorder but did not find any significant associations with other substance use disorders (Choi et al., 2017). Results presented here contribute to the literature by being among the first to show differential associations between medical cannabis and non-medical cannabis use with respect to the use of stimulants in a sample of marginalized women with high burdens of physical and mental illness, experiences of violence, and at high risk for HIV transmission and overdose.

Considering opioids, non-medical cannabis use increased the odds of opioid use when compared to no use, but non-medical use did not increase the odds of opioid use compared to either medical use or non-use. This lack of significant association may be due to in part to limited power to detect significant differences as opioid use was less prevalent in this sample, though odds ratio estimates were in a similar direction as those for stimulants.

The positive association between non-medical cannabis use and stimulant use is in line with previous work reporting that non-medical cannabis use is correlated with the use of other illicit substances in community and clinical populations (Bierut et al., 2008; Narvaez et al., 2014). Results suggest that stimulant use is associated with lower mental health scores and homelessness in a vulnerable population, which is similar to prior studies reporting that

frequent stimulant use and greater drug dependence were associated with poorer mental health among homeless persons in the United States (Stringfellow et al., 2016) and Toronto, Canada, (Grinman et al., 2010) and living on the streets among homeless women in Canada (Torchalla et al., 2011). Findings emphasize the concurrent burdens of poor mental health, stimulant use, and unstable housing among impoverished women. Additionally, our prior work suggests that the incident use of stimulants among unstably housed women who did not use at study entry is predicted by recent sexual violence (Riley et al., 2015). Results of this study reiterate the importance of violence in that stimulant use is associated with recent emotional violence at this later study point.

Timing and reasons for using cannabis among women experiencing violence is beyond the scope of the current study; however one possibility supported by prior studies is that cannabis may be used by some to manage and cope with trauma by favoring the sedating effects of cannabis rather than the intensity and agitation of stimulant use, and medical cannabis may be preferred to manage the quality and safety of the cannabis and minimize legal risks such as arrest (Lau et al., 2015a; MacCoun, Reuter, & Schelling, 1996). While self-medication with cannabis specifically (vs. substances in general) has not been studied in this population, self-medication for psychological distress has been suggested as one of several motives for cannabis use among male veterans experiencing post-traumatic stress disorder (Bonn-Miller, Vujanovic, & Drescher, 2011). Additionally, women who use cannabis for therapeutic purposes in Canada report using cannabis for illness self-management, as a way to manage addiction to other substances, and, by acquiring cannabis from dispensaries and through known channels rather than unregulated “street” sources, to have more assurance of the quality and safety of cannabis (Bottorff et al., 2011).

Although not the focus of the current study. substitution of cannabis for other drugs to manage cravings, improve appetite and appearance, and use a less stigmatized substance has been reported in qualitative work with older cannabis users (Lau et al., 2015a, 2015b), people who inject heroin (Wenger, Lopez, Comfort, & Kral, 2014), medical cannabis patients (Lucas et al., 2016; Reiman, 2009), people who use in cannabis in the Netherlands (Sifaneck & Kaplan, 1995), young men who use crack in Brazil (Labigalini, Rodrigues, & Da Silveira, 1999), and women who use crack in Jamaica (Dreher, 2002), and was reported in quantitative studies of people who use drugs in Canada (Socias et al., 2017). This prior research regarding substitution of cannabis for other drugs suggests that other drug use may be reduced, however we note that non-medical cannabis use was associated with higher odds of stimulant use in the current study. Future prospective research may offer a better understanding of whether medical cannabis use predicts lower levels of other drug use among unstably housed women living in U.S. urban settings who are actively attempting to reduce use or abstain from other drugs.

There are several potential limitations of this study. First, given that this is a cross sectional analysis, we are unable to determine causality. Thus, we cannot determine whether medical cannabis use led to reductions in street drug use, or if women who used stimulants or opioids were more likely to use additional street drugs like non-medical cannabis. In either case, individuals using medical cannabis present with lower risk profiles for homelessness and stimulant use, thus the inclusion of cannabis source in risk assessment may aid medical

management and safety planning for impoverished women. Second, compared to the whole cohort, a lower proportion of women included in the current analysis were homeless at baseline, which may have biased the sample toward higher functioning individuals or those with more resources to acquire a physician recommendation for medical cannabis. While lower rates of homelessness during the study period of interest resulted from this differential loss to follow up, the proportion of individuals experiencing street and shelter-based homelessness was still substantially higher than in the general population. Third, while ACASI technology was used to minimize socially desirable responding, substance use information was self-reported, which may have led to underreporting of use. However, underreporting would have led to a bias toward the null, suggesting that effects are at least as strong as those reported here. Fourth, the relatively small number of participants reporting medical cannabis use and reporting opioid use may have reduced our statistical power to detect significant differences in opioid use prevalence in those reporting medical vs. non-medical cannabis use.

While true for all studies addressing this topic, a final limitation is the classification of “medical” and “non-medical” cannabis use. The definition used here, having a “prescription” to refer to a medical recommendation for cannabis, was based on pilot interviews with unstably housed women. It increased internal validity by making terminology familiar and easy to understand within the study group; however, it may not fully reflect intentions or the level of medical supervision. While use of the term “prescription” rather than the legally correct term “recommendation” may have also misclassified some participants, our pilot work indicated that misclassification would have been far greater if the adapted version had not been used. Furthermore, given that recommendations are only valid for 12 month, some participants who were classified as using cannabis non-medically may have been previously using cannabis for medical reasons and continuing to do so but without a recommendation.

Conclusions

In addition to social determinants of health, mental health status, and experiences of violence, findings presented here suggest relationships between cannabis use and the use of street drugs that depend on whether cannabis use is recommended in a medical context. These findings suggest that medical and non-medical cannabis use should be considered separately in research, health services, and policy development regarding the influence of cannabis on other drugs, especially in light of the rapidly evolving changes in the legal status of recreational and medical cannabis use.

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Table 1

Social determinants, substance use, health status, and violence experience during the prior 6 months stratified by cannabis use category among unstably housed and homeless women (N = 245)

			Cannabis Use						
	Overall		**No Cannabis Use N=124**		**Medical Cannabis Use N=52**		**Non-medical Cannabis Use N=69**		**Omnibus p-value**
	N/mean	**%/SD**	**N/mean**	**%/SD**	**N/mean**	**%/SD**	**N/mean**	**%/SD**	
Social Determinants									
Age (mean, SD)	47.5	8.5	47.8	8.6	47.8	8.8	46.9	8.2	0.733
White race/ethnicity (vs. other races)	70	29%	36	29%	16	31%	18	26%	0.842
Completed High School	158	64%	73	59%	36	69%	49	71%	0.174
Slept in a shelter/on the street (past 6 mo)	44	18%	21	17%	4	8%	19	28%	0.017
Unmet subsistence needs (past 6 mo)	80	33%	37	30%	16	31%	27	39%	0.281
≥ Median monthly income (past 6 mo)[a]	118	48%	56	45%	27	52%	35	51%	0.630
Illicit substance Use (past 6 mo)									
Stimulants[b]	117	48%	42	34%	25	48%	50	72%	<.001
Opioids[c]	46	19%	15	12%	9	17%	22	32%	0.003
Health Conditions & Status (past 6 mo)									
HIV-infected	126	51%	64	52%	35	67%	27	39%	0.009
Chronic physical health condition[d]	124	51%	61	49%	28	54%	35	51%	0.853
SF-12 Physical Health score[e] (mean, SD)	39.1	11.2	38.8	11.5	36.3	9.8	39.9	11.3	0.139
Pain interferes quite a bit/extremely with daily activities	89	36%	45	36%	22	42%	22	32%	0.498
SF-12 Mental Health score[e] (mean, SD)	42.5	12.3	43.4	13.1	44.8	12.1	39.2	11.8	0.032
Experience of Violence (past 6mo)									
Physical	40	16%	18	15%	11	21%	11	16%	0.551
Sexual	7	3%	2	2%	1	2%	4	6%	0.270
Emotional	135	55%	59	48%	32	62%	44	64%	0.055

[a] Median monthly income of $929 USD

[b] Stimulants include crack cocaine, powder cocaine, methamphetamine

[c]Opioids include heroin, un-prescribed opioid painkillers

[d]Chronic health condition was defined as at least one of the following: heart disease, emphysema, asthma, hypertension, diabetes

[e]Higher SF-12 scores indicate better health

Table 2

Adjusted and unadjusted associations between stimulant/opioid use (outcomes) and cannabis use category (exposure)

	Stimulant use[a] - unadjusted			Stimulant use[a] – adjusted final model			Opioid use[b] – unadjusted			Opioid use[b] – Adjusted final model		
	OR	**95%**	**CI**	**AOR**	**95%**	**CI**	**OR**	**95%**	**CI**	**AOR**	**95%**	**CI**
Cannabis Use												
Non-medical vs. none	**5.14**	**2.69**	**9.80**	**4.34**	**2.17**	**8.70**	**3.40**	**1.62**	**7.13**	**3.81**	**1.78**	**8.15**
Medical vs. none	1.81	0.94	3. 50	1.82	0.87	3.79	1.52	0.62	3.74	1.65	0.67	4.11
Medical vs. non-medical	**0.36**	**0.17**	**0.75**	**0.42**	**0.18**	**0.96**	0.45	0.19	1.08	0.43	0.18	1.06
Age	0.99	0.96	1.02				0.98	0.94	1.02			
White vs. non-White	0.64	0.37	1.13	**0.44**	**0.23**	**0.87**	0.64	0.30	1.38			
High school completion	0.90	0.53	1.52				0.59	0.31	1.13	**0.50**	**0.25**	**0.98**
Homelessness	**3.19**	**1.58**	**6.46**	**2.72**	**1.22**	**6.07**	1.84	0.86	3.94			
Unmet subsistence needs	1.59	0.94	2.70				1.77	0.92	3.40			
≥ Median monthly income[c]	1.11	0.67	1.84				1.22	0.64	2.32			
HIV positive	0.81	0.49	1.34				1.29	0.68	2.46			
Chronic physical condition[d]	1.28	0.78	2.12				1.20	0.63	2.29			
Pain interference	1.19	0.71	2.01				1.62	0.85	3.10			
SF-12 Mental Health score	**0.96**	**0.94**	**0.98**	**0.96**	**0.94**	**0.99**	0.98	0.96	1.01			
Physical Violence	**2.33**	**1.15**	**4.71**				1.32	0.58	3.00			
Sexual Violence	2.81	0.54	14.77				3.40	0.74	15.8			
Emotional Violence	**3.08**	**1.82**	**5.22**	**2.70**	**1.48**	**4.91**	1.50	0.77	2.90			

[a] Stimulants include crack cocaine, powder cocaine, methamphetamine

[b] Opioids include heroin, un-prescribed opioid painkillers

[c] Median monthly income of $929 USD

[d] Chronic health condition was defined as at least one of the following: heart disease, emphysema, asthma, hypertension, diabetes

OR = Odds Ratio, AOR = Adjusted Odds Ratio, CI = Confidence Interval **bold** = p<0.05