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Frequent Marijuana Use, Binge Drinking and Mental Health Problems Among Undergraduates

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Abstract

Background and Objectives—In light of the rapidly changing legal status of marijuana in the U.S., there has been increased interest in the potentially adverse outcomes of heavy marijuana use among young persons. The goal of this study was to investigate frequent marijuana use among undergraduates, and its association with the use of illicit substances, mental health problems, and stress.

Methods—Undergraduates from one university in the Northeast were surveyed using a questionnaire derived from the American College Health Association-National College Health Assessment (N =1,776). Logistic regression analyses were used to examine relationships between frequency of marijuana use and other substance use, binge drinking, negative consequences of drinking, mental health problems, and perceived stress. Analyses were adjusted for demographics differences such as gender, race, year in school, and sorority/fraternity membership.

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Results—Approximately 1 in 12 undergraduates (8.5%) reported using marijuana more than 10 days in the past month. Frequent marijuana use was associated with increased likelihood of other substance use and alcohol-related negative outcomes. Marijuana use was associated with increased reports of anxiety, and frequent use was associated with depression and substance use problems. Perceived stress was not associated with marijuana use.

Conclusions and Scientific Significance—These findings, indicating that frequent use is related to depression, other substance use and negative outcomes, contribute to our understanding of marijuana use among undergraduates. Given the relatively high prevalence of marijuana use among young persons, future studies should seek to uncover potentially causal relationships between frequent marijuana use and a variety of negative outcomes.

INTRODUCTION

Marijuana is the most commonly used illicit drug in the United States.[1] Data indicate that the prevalence of marijuana use among college students has increased since 2000.[2] For example, in 2000, 13.6% of young adults reported past-month marijuana use[3]; by 2013, the percentage increased to 19.1%.[1] In addition, 23 states and the District of Columbia now allow the medical use of marijuana for certain conditions, and within the past two years, four states legalized the recreational use of marijuana for adults. These developments may increase the availability and use of marijuana by adults and there is some concern that use by young people might be increased as a result.[4,5] It is important to note that there are not yet any data to support or refute this concern.

Heavy, long-term use of smoked marijuana use has been shown to negatively affect lung function[6] and cardiovascular health.[7] In addition, it is estimated that approximately 9% of those who use marijuana will become dependent at some point in their lifetime.[8,9] Young adulthood is a particularly critical period for the development of drug use problems. It has been estimated that 20% of young adults meet criteria for substance abuse or dependence, and only 7% of these young adults receive treatment.[10] As the availability of marijuana becomes more widespread, it will be important to monitor the correlates of frequent marijuana use in young adults, a group that might be at greater risk for marijuana-related negative effects, including dependence.

Currently, there are some gaps in the field's understanding of the relationship between frequent marijuana use and other substance use, mental health, and stress among young people. Marijuana use has commonly been associated with the use of other substances among young people.[11–15] For example, one study that included undergraduates from 140 universities across the U.S. found that approximately 99% of marijuana users also reported current use of other substances.[14] In particular, concurrent use of marijuana, cigarettes, and binge drinking is common among undergraduates.[11,12,14,16–18] While the association between marijuana and binge alcohol use has been studied extensively, the effect of marijuana-alcohol co-use on drug-related negative consequences has only been examined in a handful of studies among undergraduates.[19–21] For example, undergraduates who used both marijuana and alcohol in the past year reported higher rates of substance-related negative consequences when compared to students who had only used alcohol.[21] However,

this study measured any past year marijuana or alcohol use; therefore it is unknown whether this relationship differs depending on frequency of use. Such information may be important in determining the consequences associated with poly-drug use.

Importantly, the extent to which frequent marijuana use is related to mental health problems, and particularly to depression and anxiety, remains unclear. A recent systematic review of longitudinal and population-based studies indicated inconsistent and weak associations between marijuana use and risk of affective outcomes, although stronger associations were observed with early-onset, frequent marijuana use.[22] For example, only five out of ten studies that investigated marijuana use and a diagnosis of depression found evidence of an association. Of note, the studies that compared rates of depression across marijuana use frequencies found stronger associations. Fewer studies examined anxiety outcomes, although these studies also reported weak or null associations. Thus, the relationship between frequent marijuana use and mental health remains unclear. As the transition from adolescence to adulthood brings increased risk for drug use and the onset of mental health problems, it is important to expand on this literature.

Finally, the relationship between stress and marijuana use remains largely uncharacterized. Stress is an important risk factor and motivator for marijuana use, particularly in frequent compared to occasional users.[23] For example, college students consistently report stress relief as the most common reason for marijuana use,[24–26] and these stress-coping motives can predict marijuana use problems among undergraduates.[25,26] Yet, to our knowledge, the relationship between perceived stress and frequency of marijuana use among college students has not been investigated.

The current study aims to begin to fill these gaps by addressing four aims: 1) to investigate the relationship between frequent marijuana use and use of other substances; 2) to examine the relationship between frequent marijuana use and alcohol consumption, binge drinking, and perceived negative consequences of drinking; 3) to investigate the relationship between frequent marijuana use and mental health problems; 4) to examine the relationship between perceived stress and marijuana use among undergraduates at a small Northeastern university. We hypothesized that there would be a significant association between frequent marijuana use and other substance use, binge drinking and alcohol-related adverse outcomes, diagnosis of anxiety and depression, and stress.

METHODS

Sample

Data were collected in spring 2009 using the American College Health Association-National College Health Assessment (ACHA-NCHA).[27] The ACHA-NCHA is a national survey that consists of approximately 300 variables assessing student health, health-related behaviors, access to health information, and health-related outcomes. It has been evaluated extensively for reliability and validity in U.S. college students.[28] The present study uses data from the drug use, mental health, and stress variables from the full instrument and included data from 1,776 undergraduate students from a highly competitive private institution in the Northeast United States. All enrolled undergraduates in the primary undergraduate academic school

were invited via their campus email account to participate (N =5,859). Up to three reminders over the course of a 3 week period were sent to non-responders. A total of 1,841 surveys were received (31.4%). Participants had the option to skip questions, which accounts for the variation in the sample size according to question. Participants were entered into a drawing for gift certificates from a travel provider or the bookstore upon completion of the survey. Data from graduate students were excluded from all analyses. The university's Institutional Review Board approved the study.

Measures

Demographics—Participants reported demographic information including age, gender, year in school, race/ethnicity, membership in fraternity/sorority, and approximate grade point average (GPA).

Marijuana and Other Substance Use—Seven questions were used to assess substance use. Participants were asked "Within the last 30 days, on how many days did you use:" marijuana, cigarettes, alcohol, cocaine, methamphetamine, other amphetamines, and hookah? Response choices ranged from *1: never used, 2: have used, but not in the past 30 days, 3: 1–2 days, 4: 3–5 days, 5: 6–9 days, 6: 10–19 days, 7: 20–29 days, to 8: used daily.*

Binge Drinking and Negative Consequences of Drinking—Participants were asked "Over the last two weeks, how many times have you had 5 or more drinks in one sitting?" Response choices ranges from *1:N/A don't drink, 2:none, 3:1 time, 4:2 times, 5: 3 times, 6: 4 times, 7: 5 times, 8: 6 times, 9: 7 times, 10: 8 times, 11: 9 times, 12:10 times or more.* Negative consequences of drinking were assessed by a six-part question: "Within the last 12 months, have you experienced any of the following as a consequence of your drinking: did something you later regretted, forgot where you were or what you did, got in trouble with the police, had unprotected sex, physically injured yourself, and physically injured another person." Response choices ranged from 1 to 3, or *1: N/A don't drink, 2: no, 3: yes.*

Mental Health—Three questions were used to assess mental health. Participants were asked, "Within the past 12 months, have you been diagnosed or treated by a professional for depression (or anxiety/substance use disorder) ?" Response choices ranged from 1 to 6, or *1: no, 2: diagnosed but not treated, 3: diagnosed and treated with medication, 4: diagnosed and treated with psychotherapy, 5: diagnosed and treated with medication and psychotherapy,* or *6: other treatment.*

Stress—Levels of stress during the past 12 months were assessed with a single question, "Within the last 12 months, how would you rate the overall level of stress you have experienced?" Responses ranged from 1 to 5, or *1: no stress, 2: less than average stress, 3: average stress, 4: greater than average stress, 5: tremendous stress.*

Data Analyses

Students were first separated into groups based on level of past-month marijuana use: "non-users" were defined as those who reported no past 30-day marijuana use, "occasional users" as those who reported 1–2 days of use, "regular users" reported 3–9 days of use, and

"frequent users" were defined as those who reported >10 days of use in the past month. Current use refers to those who report any past month marijuana use. Comparisons on demographic characteristics among students with different levels of marijuana use were made using chi-square tests with significance set at $p < .05$. Logistic regression analyses were used to examine the relationships between marijuana use and other drug use, binge drinking, negative consequences of drinking, mental health, and perceived stress. Results estimating the strength of associations are reported using adjusted odds ratios with 95% confidence intervals. Odds ratios were adjusted by including gender, race, year in school, and fraternity/sorority membership (ie, all demographic factors that were significantly associated with marijuana use) in logistic regression analyses.

RESULTS

Marijuana use in the past month was reported by 23.8% (323/1,357) of undergraduates. Ten percent (10.2%) reported using marijuana 1–2 days in the past month, 7.1% reported using 3–9 days, and 8.5% reported using >10 days.

Demographics

The average age of students was 19.9 years old. Forty-seven point three percent (47.3%) identified as White, 6.2% as Black, 11.0% as Hispanic, 26.9% as Asian or Pacific Islander, and 8.5% as Multiracial. Students were approximately evenly distributed across undergraduate year in school (29.8% 1st year, 26.0% 2nd year, 24.7% 3rd year, and 19.5% 4th year). Nine point eight percent (9.8%) reported that they belonged to a fraternity or sorority. Fifty-four point seven percent (54.7%) of students reported a GPA in the A range, 41.4% in the B range, and 3.9% reported a C or below.

Demographics Associated With Marijuana Use

Marijuana use was significantly more common among males, white students, seniors, and members of fraternities/sororities (Table 1). These demographic factors were also significantly associated with frequency of use. Female students were more likely to report no use or occasional use while males reported more frequent use ($p = .002$). Sixty-four percent (64.0%) of the students who reported frequent use were White. Black and Asian/Pacific Islander students exhibited low rates of marijuana use. Sophomore students more frequently reported occasional use, while seniors were more likely to report regular or frequent use ($p = .029$). Seventeen point eight percent (17.8%) of students who used marijuana frequently reported belonging to a fraternity or sorority, compared to 7.8% of non-users ($p = .000$). There were no significant associations between marijuana use and age or approximate GPA.

Marijuana and Other Substance Use

Marijuana users, compared to non-users, were significantly more likely to report current use of all other substances (Table 2). Frequent marijuana users were also more likely to use all other substances when compared to occasional users and non-users. There was a strong association between marijuana and alcohol use ($p = .001$). Almost all students who reported marijuana use also reported alcohol use. The strongest association was observed for cocaine.

Compared to non-users, occasional users had 6.9 higher adjusted odds (95%CI = 4.0–11.9) of also reporting cocaine use, regular users had 13.7 higher adjusted odds (95%CI =7.8–23.9), and frequent users had 25.8 higher adjusted odds (95%CI =15.0–44.2). Further, of the students who reported frequent marijuana use, a majority (>80%) also reported current use of cigarettes, hookah, and alcohol, almost half (46.7%) reported using cocaine use, and 30.3% reported using amphetamines. Compared to those who reported no use, frequent users had 14.7 higher adjusted odds of cigarette use (95%CI =8.1–26.6), 16.8 higher adjusted odds of alcohol use (95%CI =2.3–123.0), 25.8 higher adjusted odds of cocaine use (95% CI =15.0–44.2) 7.6 higher adjusted odds of amphetamine use (95%CI =2.9–20.2), and 22.3 higher adjusted odds of current hookah use (95%CI =9.6–51.8).

Marijuana Use, Binge Drinking, and Negative Consequences of Drinking

Frequency of marijuana use was significantly associated with frequency of binge drinking, even after adjusting for potential confounding factors (1–2 days use: Adjusted OR =3.8, 95%CI =2.3–5.9; 3–9 days: Adjusted OR =3.3, 95%CI =1.9–5.6; >10 days: Adjusted OR =5.5, 95% CI =3.3–9.1). For example, 36.9% of students who used marijuana frequently also reported binge drinking on at least three occasions in the past 2 weeks, compared to 23.2% of occasional users and 6.4% of non-users. Seventy three percent (73.2%) of students who did not use marijuana also did not binge drink. A number of alcohol-related negative consequences were also significantly associated with marijuana use, even when controlling for binge drinking (Table 3). Students who reported using marijuana were also more likely to report regretting something they did while intoxicated, forgetting what they did, and having unprotected sex. Frequency of marijuana use was associated with drinking-related trouble with the police. Specifically, when compared to non-users, regular marijuana users were 4.0 times more likely (95%CI =1.3–12.4) to have an encounter with the police, and frequent users were 7.6 times more likely (95%CI =2.8–20.9). Marijuana use was not associated with injuring self or others after adjusting for demographic factors.

Marijuana Use, Mental Health, and Stress

Marijuana use was significantly associated with major depressive disorder, anxiety disorders, and substance use disorders (Table 4). Specifically, major depression was significantly associated with frequent marijuana use in the past month (Adjusted OR =1.9; 95%CI =1.0–3.6). In contrast, anxiety was significantly associated with marijuana use, but not frequency of use. There were no significant associations between perceived stress and marijuana use.

DISCUSSION

Approximately 1 in 12 undergraduates (8.5%) reported using marijuana more than 10 days in the past month. Results indicate that frequent marijuana use was associated with other substance use, binge drinking, and negative consequences related to drinking compared with individuals who did not use marijuana. Frequent marijuana use was also associated with mental health problems in this sample; there was no link between marijuana use and perceived stress.

Frequent marijuana use was associated with increased rates of other substance use, and particularly with cocaine. These data are generally consistent with previous reports in high school and college students, indicating that students who use marijuana commonly report using other substances as well.[29] Indeed, a number of studies have reported that students who use marijuana engage in a larger cluster of risky/deviant behaviors, including other drug use.[12,30,31]

Almost three out of four marijuana users (68%) reported that they had engaged in binge drinking at least once in the past two weeks. Further, frequent marijuana users engaged in binge drinking more often than occasional users, who in turn engaged in binge drinking more often than non-users. These data are generally consistent with previous reports indicating that college students who reported current use of marijuana were 6.8 times more likely (95%CI =6.11–7.62) to engage in binge drinking.[14] Our results extend prior work by showing that more frequent use of marijuana is associated with the greatest risk for frequent binge drinking.

Importantly, even when groups were matched for frequency of binge drinking, use of both marijuana and alcohol was associated with more negative consequences related to drinking, compared with those who used alcohol but not marijuana. The present findings are consistent with a handful of studies indicating that college students who report any past-year alcohol and marijuana use were more likely to experience negative consequences than students who only used alcohol.[19–21] These results build on this work by indicating that frequency of use is also positively associated with alcohol-related adverse consequences. While the current survey did not specifically ask students about concurrent marijuana and alcohol use, the data lend partial support to the hypothesis that poly-drug abuse may increase negative consequences associated with drug use. Future studies should attempt to more directly assess the prevalence and physical/psychosocial consequences of poly-drug use among young people.

Frequent marijuana use was also associated with mental health problems. Specifically, an association between marijuana use and major depression was observed among students who reported using marijuana frequently (>10 days per month). We also found that any past month marijuana use was associated with increased odds of being diagnosed or treated for anxiety. The literature on this point is inconsistent. In an integrative data analysis across four large population based studies, a total of 6,900 participants were assessed repeatedly on measures of marijuana use and depression over the period from mid-adolescence to adulthood.[32] The authors found that frequency of marijuana use was associated with increasing depressive symptoms, with the strongest association occurring in adolescence and declining with age. However, another recent, large scale longitudinal study followed a cohort of adolescents up to 29 years of age and found no association between marijuana use and major depressive episodes, even when examining frequency of use.[33] These researchers did, however, report persistent associations between marijuana use and anxiety disorder.

It is important to note that only a minority of those with depression, anxiety, and substance use disorders seek treatment, suggesting that the present study may underestimate problems, as it examined self-reports of treatment over the past 12 months. Nevertheless, the current

data suggests that the association between marijuana use and mental health in college students may be strongest in those with more severe mental health problems, and specifically in treatment-seeking subsamples.

We did not observe an association between marijuana use and perceived stress. This finding was unexpected because data from previous research show a relationship between stress and substance use.[23] The results may be due to the low variability in levels of perceived stress in our sample. Over 50% of students reported experiencing greater than average or tremendous stress in the past 12 months. Future studies should attempt to refine and expand the instrument used to measure stress in order to further explore this relationship.

The present results must be interpreted within the context of a few limitations. Importantly, study participants were students at one university located in the Northeastern section of the U.S. This, coupled with the fact that we obtained a 30% completion rate, raises questions about the generalizability of the results. The finding that 23.8% of the current respondents reported using marijuana in the past month is consistent with results from the 2009 Monitoring The Future survey of college students. In that study, 18.5% of the respondents reported current marijuana use.[34] These observations enhance the likelihood of the current findings applying more broadly, though replication with unselected samples is needed to confirm this.

The current findings are also constrained by the cross-sectional nature of the study, such that causation cannot be determined for any of the measured variables. Longitudinal data is needed to infer the temporal order of substance use, stress, and mental health problems. Another concern is that it is possible that other unknown factors may have contributed to the observed associations, despite the fact that analyses were adjusted for significant demographic factors. Finally, the uneven distribution in frequency of marijuana use may have reduced the power of the logistic regression models. This may explain the wide confidence intervals reported for adjusted odds ratios of other substance use.

In summary, the present findings add to a growing database investigating consequences of combined marijuana and alcohol use among undergraduates; they provide evidence for an interaction between frequent marijuana use and alcohol-related adverse consequences. As poly-drug abuse is widespread among illicit drug users and particularly among young people, it is important to understand the physical and psychosocial consequences of poly-drug use in this population. The data also contributes to a growing literature on frequent marijuana use and affective mental health problems among undergraduates. A better understanding of the relationship between marijuana use and mental health can inform future research and ultimately public policy. It is important to note, however, that 95% of the students in this study reported a GPA in the B range or better, suggesting that they continued to do well academically despite marijuana use or any other issues.

Nonetheless, the current study reports data collected in 2009 and the legal status of medical and recreational marijuana use have dramatically changed since this time. Before 2012, recreational use of marijuana was illegal in all 50 states. Adults may now legally use the drug for recreational purposes in four states: Alaska, Colorado, Oregon, and Washington.

These interesting developments should impact the prevalence of marijuana use. It is our hope that the current data may be used to determine how the prevalence and correlates of marijuana use change as acceptance of marijuana becomes more widespread. Given the relatively high prevalence of marijuana use among young persons, future studies should investigate the potentially causal relationships between frequent marijuana use and mental health. As marijuana policies are liberalized across the country, this issue will become even more vital, especially for organizations comprised of large numbers of young adults.

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TABLE 1

Demographics associated with marijuana use among undergraduates

Frequency of marijuana use in the past 30 days	**None (1,036) (n) %**	**1–2 Days (139) (n) %**	**3–9 Days (96) (n) %**	**>10 Days (90) (n) %**	***p*-value**
Age M (SD)	19.8 (1.5)	19.9 (1.3)	19.9 (1.4)	20.2 (1.3)	.16
Gender					**.001**
Female (56.5%)	(595) 57.4%	(84) 60.4%	(51) 53.1%	(39) 43.3%	
Male (43.5%)	(441) 42.6%	(55) 39.7%	(45) 46.9%	(50) 55.6%	
Race					**<.0001**
White (47.3%)	(438) 43.6%	(74) 54.0%	(53) 56.4%	(57) 64.0%	
Black (6.2%)	(71) 7.0%	(3) 2.2%	(4) 4.2%	(4) 4.5%	
Hispanic (11.0%)	(103) 10.3%	(18) 13.1%	(15) 16.0%	(9) 10.1%	
Asian or Pacific Islander (26.9%)	(308) 30.7%	(26) 19.0%	(9) 9.6%	(10) 11.2%	
Multiracial (8.5%)	(75) 7.5%	(15) 10.9%	(13) 13.8%	(8) 9.0%	
Undergraduate Year in School					**.02**
1 (29.8%)	(322) 31.0%	(33) 23.7%	(29) 30.2%	(17) 18.9%	
2 (26.0%)	(261) 25.1%	(49) 35.3%	(20) 20.8%	(20) 22.2%	
3 (24.7%)	(258) 24.9%	(29) 20.9%	(22) 22.9%	(24) 26.7%	
4 (19.5%)	(184) 17.7%	(26) 18.7%	(24) 25.0%	(28) 31.1%	
Fraternity/Sorority (9.8%)	(80) 7.8%	(16) 11.5%	(20) 20.8%	(16) 17.8%	**<.0001**
Approximate GPA					.158
A (54.7%)	(576) 55.6%	(71) 51.4%	(55) 57.3%	(36) 40.0%	
B (41.4%)	(408) 39.4%	(63) 45.7%	(40) 41.7%	(48) 53.3%	
C or below (3.9%)	(42) 3.9%	(4) 2.9%	(1) 1.0%	(6) 6.7%	

p-values <.05 are in bold.

TABLE 2

Marijuana use and any past 30 day other substance use among undergraduates

Frequency of marijuana use in past 30 days	None (1,034) (n) %	1–2 days (138) (n) %	3–9 days (96) (n) %	>10 days (89) (n) %
Cigarettes	(123) 11.9%	(85) 61.2%	(74) 77.9%	(75) 83.3%
OR 95%CI	1.0 (reference group)	**4.6 3.2–6.6**	**10.3 6.2–16.9**	**15.6 8.7–27.9**
Adjusted OR 95%CI	–	**4.6 3.2–6.7**	**9.8 5.9–16.4**	**14.7 8.1–26.6**
Alcohol	(745) 72.1%	(138) 100.0%	(96) 100.0%	(88) 98.9%
OR 95%CI	1.0 (reference group)	–	–	**21.7 3.0–156.5**
Adjusted OR 95%CI	–	–	–	**16.8 2.3–123.0**
Cocaine	(1) .1%	(24) 17.3%	(29) 30.2%	(42) 46.7%
OR 95%CI	1.0 (reference group)	**6.7 3.9–11.4**	**13.9 8.2–23.6**	**28.7 17.2–48.0**
Adjusted OR 95%CI	–	**6.9 4.0–11.9**	**13.7 7.8–23.9**	**25.8 15.0–44.2**
Amphetamines	(9) .9%	(15) 10.9%	(15) 15.6%	(27) 30.3%
OR 95%CI	1.0 (reference group)	**5.9 2.4–14.1**	**6.4 2.4–16.9**	**8.2 3.3–20.7**
Adjusted OR 95%CI	–	**5.7 2.3–14.0**	**5.6 2.0–15.4**	**7.6 2.9–20.2**
Hookah	(210) 20.3%	(102) 73.4%	(79) 83.2%	(83) 92.2%
OR 95%CI	1.0 (reference group)	**4.9 3.2–7.2**	**8.7 5.0–15.0**	**24.4 10.6–56.2**
Adjusted OR 95%CI	–	**4.8 3.2–7.1**	**8.4 4.8–14.6**	**22.3 9.6–51.8**

p-values <.05 are in bold.

TABLE 3

Marijuana use and negative consequences from drinking among undergraduates

Frequency of marijuana use in past 30 days	None (714) (n) %	1–2 days (137) (n) %	3–9 days (94) (n) %	>10 days (86) (n) %
Did something you later regretted 32.3%	(167) 23.4%	(72) 52.6%	(47) 50.0%	(47) 54.7%
OR 95%CI	1.0 (reference group)	**2.5 1.7–3.6**	**2.3 1.5–3.5**	**2.8 1.8–4.4**
Adjusted OR 95%CI	–	**2.0 1.4–3.0**	1.5 1.0–2.3	**2.0 1.2–3.2**
Forgot what you did or who you were with 26.1%	(123) 17.3%	(59) 43.7%	(48) 51.1%	(38) 44.7%
OR 95%CI	1.0 (reference group)	**2.6 1.8–3.7**	**3.4 2.2–5.3**	**2.7 1.7–4.3**
Adjusted OR 95%CI	–	**1.9 1.3–2.9**	**2.0 1.3–3.2**	**1.8 1.1–2.9**
Had a run-in with police 2.3%	(6) .8%	(4) 2.9%	(5) 5.3%	(8) 9.4%
OR 95%CI	1.0 (reference group)	3.0 1.0–9.7	**5.6 1.9–16.6**	**10.8 4.1–27.1**
Adjusted OR 95%CI	–	2.4 .7–7.9	**4.0 1.3–12.4**	**7.6 2.8–20.9**
Had unprotected sex 8.7%	(29) 4.1%	(27) 20.0%	(16) 17.0%	(17) 19.8%
OR 95%CI	1.0 (reference group)	**3.2 2.0–5.2**	**2.6 1.5–4.7**	**3.2 1.8–5.7**
Adjusted OR 95%CI	–	**2.8 1.7–4.6**	1.8 1.0–3.4	**2.5 1.3–4.6**
Injured self 9.8%	(42) 5.9%	(24) 17.6%	(20) 21.3%	(15) 17.4%
OR 95%CI	1.0 (reference group)	**2.0 1.2–3.2**	**2.5 1.5–4.3**	**2.0 1.1–3.6**
Adjusted OR 95%CI	–	1.4 .8–2.3	1.5 .9–2.7	1.2 .7–2.3
Injured others 1.6%	(5) .7%	(4) 2.9%	(3) 3.2%	(4) 4.7%
OR 95%CI	1.0 (reference group)	2.4 .8–7.4	2.6 .7–9.2	**3.9 1.3–12.1**
Adjusted OR 95%CI	–	1.7 .5–5.5	1.4 .4–5.3	2.1 .5–8.0

p-values <.05 are in bold.

TABLE 4

Marijuana use and past 12-month diagnosis and/or treatment for mental health disorders

Frequency of marijuana use in past 30 days	**None (1,063) (n) %**	**1–2 days (142) (n) %**	**3–9 days (97) (n) %**	**>10 days (90) (n) %**
Major Depressive Disorder	(74) 7.1%	(16) 11.3%	(13) 13.5%	(14) 15.6%
OR 95%CI	1.0 (reference group)	1.3 .7–2.2	1.7 .9–3.1	**2.0 1.1–3.6**
Adjusted OR 95%CI	–	1.2 .6–2.1	1.6 .9–3.1	**1.9 1.0–3.6**
Anxiety Disorder (unspecified)	(72) 6.9%	(23) 16.4%	(19) 19.8%	(16) 18.0%
OR 95%CI	1.0 (reference group)	**2.0 1.2–3.3**	**2.5 1.4–4.3**	**2.4 1.3–4.2**
Adjusted OR 95%CI	–	**1.9 1.2–3.2**	**2.3 1.3–4.1**	**2.2 1.2–4.1**
Substance Use Disorder	(4) .4%	(2) 1.4%	(4) 4.2%	(3) 3.4%
OR 95%CI	1.0 (reference group)	2.1 .5–9.7	**6.4 2.0–20.8**	**5.1 1.3–19.0**
Adjusted OR 95%CI	–	2.4 .5–12.4	**7.8 2.1–28.7**	**5.2 1.3–21.6**

p-values <.05 are in bold.