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Race/Ethnicity Differences between Alcohol, Marijuana, and Co-Occurring Alcohol and Marijuana Use Disorders and their Association with Public Health and Social Problems using a National Sample

Lauren R. Pacek, BS¹, Robert J. Malcolm, MD², and Silvia S. Martins, MD, PhD¹

¹Department of Mental Health, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland ²Department of Psychiatry and Behavioral Sciences, Center for Drug and Alcohol Programs, Medical University of South Carolina, Charleston, South Carolina Dr. Martins is now at the Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, New York

Abstract

Background—Alcohol and marijuana are commonly used and misused in the United States, both singly and together. Despite this, few studies examine their co-occurring use and the corresponding association with public health and other problems. Moreover, there is a lack of investigation into differences in these associations on the basis of race/ethnicity.

Methods—The present study estimated the frequency of alcohol use disorder, marijuana use disorder, and co-occurring alcohol and marijuana use disorder and their associated public health and social problems in Whites, African Americans, and Hispanics. This cross-sectional study included 13,872 individuals and used data from the 2005–2007 National Survey on Drug Use and Health. Frequency was calculated and multinomial regression was used to assess associations between substance use disorder and psychosocial, adverse consequences such as history of being arrested, substance use treatment, and sexually transmitted infection.

Results—Alcohol use disorder was comparable between, and most prevalent among, Whites and Hispanics compared to African Americans, whereas marijuana use disorder was greatest among African Americans compared to other race/ethnicities. Co-occurring alcohol and marijuana use disorders were most prevalent for African Americans versus Whites and Hispanics, and similar in Whites and Hispanics. In general, major depressive episode was more prevalent for respondents with co-occurring use disorders or single marijuana use disorders. However, race/ethnicity differences in associations between substance use disorder and psychosocial correlates and adverse consequences were observed.

Conclusions—Findings have implications for race/ethnicity appropriate integrated prevention and treatment of single and co-occurring use disorders and psychiatric co-morbidities.

Address correspondence to: Ms. Pacek, Johns Hopkins University Bloomberg School of Public Health, 624 N. Broadway, Hampton House 888, Baltimore, MD 21205. lropelew@jhsph.edu..

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Background

Alcohol and marijuana use are prevalent among adults in the United States. To be more exact, 50% of adults report current frequent alcohol use, and an additional 14% of adults report current infrequent alcohol use.¹ Additionally, marijuana continues to be the most widely used illegal substance in the United States.² The prevalence of marijuana use has remained stable since 1991, at roughly 4.0%, among adults in the United States.²⁻⁶ Due to the widespread use of both alcohol and marijuana, alcohol use disorders (i.e., alcohol abuse and/or dependence) and marijuana use disorders (i.e., marijuana abuse and/or dependence) are also fairly common. According to results from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), the 12-month prevalence of alcohol abuse and alcohol dependence were 4.7% and 3.8%, respectively.⁷ Similarly, past-year marijuana abuse was estimated at 1.1%, and past-year dependence at 0.4%,³ with marijuana dependence being twice as prevalent as dependence on any other illegal psychoactive substance.^{6,8-9}

Sparse research findings indicate that the simultaneous use of alcohol and marijuana is associated with greater social consequences, greater rates of alcohol dependence, as well as higher rates of depression.¹⁰ Additionally, in a sample of undergraduate college students, individuals who concurrently used both alcohol and marijuana were more likely to report academic problems and other such use-related problems as compared to alcohol drinkers only.¹¹ Furthermore, an examination of alcohol-dependent patients who continued to use cannabis after discharge from inpatient alcohol treatment were significantly more likely to return to alcohol use after sustained remission.¹²

Additional research has focused more generally on co-occurring alcohol and drug use disorders (i.e., drug abuse and/or dependence), though not necessarily marijuana use (i.e., co-occurring substance use disorder), with similar findings. Co-occurring substance use disorder has been associated with more frequent psychiatric disturbance,^{10,13-17} adverse consequences such as worse prognosis for remission and greater likelihood of relapse following treatment discharge, and a greater frequency of treatment utilization as compared to individuals with a single alcohol use disorder or single drug use disorder.^{12,18} Additionally, co-occurring substance use disorder has been shown to increase the likelihood of overdose, participation in HIV risk behaviors, poor treatment outcomes,¹⁹ and a greater likelihood of sexually transmitted infections (STI).^{10,20-22} Furthermore, the simultaneous use of alcohol with other drugs has been associated with social harms including accidents, health, and work and relationship difficulty in a study using data from the 2000 National Alcohol Survey.¹⁰ Despite this knowledge, relatively few studies have examined alcohol use disorder versus any drug use disorder versus co-occurring substance use disorder in general, let alone alcohol use disorders versus marijuana use disorders versus co-occurring alcohol and marijuana use disorders specifically, and their associated public health and social problems.²³⁻²⁴

The aforementioned studies that have examined the associations between alcohol and substance use disorders and associated public health and social problems often treat the population as one homogeneous group, when research has demonstrated that co-occurring substance use disorder and its associations may differ by race/ethnicity. As previously reported,¹⁴ prevalence of substance use disorders and psychiatric symptoms differed by race/ethnicity using the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Further studies have demonstrated racial/ethnic differences in drug treatment utilization.²⁵⁻²⁷ Additionally, research has shown that the estimates of STI and arrest history differ by race/ethnicity.²⁸⁻³⁰

When considering the high estimates of use (single and co-occurring) of, and abuse and/or dependence on alcohol and marijuana, the lack of studies comparing single alcohol use disorder, marijuana use disorder, versus co-occurring alcohol and marijuana use disorder and their associated public health and social problems is noticeable.¹⁰ The aim of this study was to provide estimates of alcohol, marijuana and co-occurring alcohol and marijuana use disorders and their correlates separately for Whites, African Americans and Hispanics. Furthermore, public health and social problems often associated with co-occurring use disorders such as major depressive episode, STI, being arrested, and treatment utilization for co-occurring disorders were assessed separately by race/ethnicity. Based on prior research,^{14,25–30} we hypothesize that rates of single and co-occurring alcohol and marijuana use disorders will vary by race/ethnicity. Specifically, we anticipate that alcohol use disorders will be greatest among Whites, as compared to African Americans or Hispanics, and that marijuana use disorders will be greatest among African Americans, as compared to other racial groups. Additionally, co-occurring alcohol and marijuana use disorder will be greatest among African Americans. Furthermore, we hypothesize that, though there may be variations within race/ethnicity, public health and social problems will be most prevalent among co-occurring alcohol and marijuana use disorder as compared to either single use disorder. Knowledge of differing rates of co-occurring use disorders and associated public health and social problems, by race/ethnicity, may serve to inform the development of race/ethnicity appropriate alcohol and substance abuse prevention and treatment efforts.

Method

Survey Design

Data were from the combined 2005–2007 datasets of the National Survey on Drug Use and Health (NSDUH) public use data files.^{2,4–6} The NSDUH is a series of cross-sectional surveys sponsored by the Substance Abuse and Mental Health Services Administration whose primary purpose was to measure the prevalence and correlates of drug use among the general population in the United States (U.S.). The target population of this survey was non-institutionalized respondents who were 12 years and older. Race/ethnicity categories included: Non-Hispanic White, Black/African American, Native American, Native Hawaiian or other Pacific Island, Asian, more than one race and Hispanic.^{2,4–6,31} Survey items were administered in the respondent's households via computer-assisted personal interviewing conducted by an interviewer (CAPI) and audio computer-assisted self-interviewing (ACASI). The surveys used independent multistage area probability sample for each of the 50 states and the District of Columbia. Final samples of 68,308, 67,802, and 67,870 were obtained with a response rate of 76%, 74%, and 74% for 2005, 2006 and 2007, respectively. An incentive of U.S. \$30 was given for participation.

Sampling weights for the NSDUH survey were computed to control unit-level and individual-level non-response and were adjusted to ensure consistency with population estimates obtained from the US Census Bureau. In order to use data from the three years of combined data, a new weight was created upon aggregating the three datasets by dividing the original weight by the number of datasets combined. Further descriptions of the sampling methods and survey techniques for the 2005–2007 NSDUH are found elsewhere.^{2,4–6}

The subpopulation of interest included adult substance users who self-reported their race/ethnicity to be White, African American or Hispanic. Other races were excluded due to small cell sizes. Respondents who reported past year co-occurring alcohol and marijuana use disorder defined as alcohol and/or marijuana abuse and/or dependence were included. Alcohol use disorder and marijuana use disorder were assessed based upon the criteria listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).³²

Adult respondents meeting criteria for past year alcohol use disorder, marijuana use disorder, or co-occurring alcohol and marijuana use disorder for the 2005, 2006 and 2007 NSDUH datasets included 4,707, 4,596, and 4,569 of the sample respectively. A raw total of 13,872 were included in the study.

Measures

Substance Use Disorder—Past year alcohol use disorder was determined given that respondents met criteria for either alcohol abuse, dependence, or both according to DSM-IV criteria.³² Also, past year marijuana use disorder was defined given that respondents met DSM-IV criteria for either abuse, dependence, or both abuse and dependence of marijuana. Questions assessing alcohol and marijuana abuse criteria in the NSDUH included: (1) “Did drinking alcohol/using marijuana or hashish cause you to have serious problems like this [neglecting children, missing work or school, doing a poor job at work or school; losing a job or dropping out of school] at home, work, or school?”; (2) “Did you regularly drink alcohol/use marijuana or hashish and then do something where being drunk/using marijuana or hashish might have put you in physical danger?”; (3) “Did drinking alcohol/using marijuana or hashish cause you to do things that repeatedly got you in trouble with the law?”; (4) “Did you have any problems with family or friends that were probably caused by your drinking/your use of marijuana or hashish?” AND “Did you continue to drink alcohol/use marijuana or hashish even though you thought it caused problems with family or friends?” All abuse criteria questions were asked with regard to the past 12-month period. Questions assessing dependence criteria for both alcohol and marijuana included: (1) “Was there a month or more when you spent a lot of your time getting or drinking alcohol/getting or using marijuana or hashish?” OR “Was there a month or more when you spent a lot of time getting over the effects of the alcohol you drank/the marijuana or hashish you used?”; (2) “Were you able to keep to the limits you set, or did you often drink more than you intended to/use more marijuana or hashish than you intended to?”; (3) “Did you need to drink more alcohol/use more marijuana or hashish than you used to in order to get the effect you wanted?” OR “Did you notice that drinking the same amount of alcohol/using the same amount of marijuana or hashish had less effect than it used to?”; (4) “Were you able to cut down or stop drinking alcohol/using marijuana or hashish every time you wanted to or tried to?”; (5) “Did you continue to drink alcohol/use marijuana or hashish even though you thought it was causing you to have problems with your emotions, nerves, or mental health?” OR “Did you continue to drink alcohol/use marijuana or hashish even though you thought it was causing you to have physical problems?”; (6) “Did drinking alcohol/using marijuana or hashish cause you to give up or spend less time doing these types [working, going to school, taking care of children, etc.] of important activities?” An additional withdrawal criteria question was included to assess alcohol dependence: “Did you have 2 or more of these symptoms [sweating or feeling that your heart was beating fast, having your hands tremble, having trouble sleeping, vomiting or feeling nauseous, seeing, hearing, or feeling things that weren't really there, feeling like you couldn't sit still, feeling anxious, having seizures or fits] at the same time that lasted for longer than a day after you cut back or stopped drinking alcohol?” All dependence criteria questions were asked regarding the past 12-month period. NSDUH researchers classified individuals responding “yes” to at least one out of four abuse criteria or “yes” to at least three out of the seven dependence criteria as having a past year alcohol or marijuana use disorder.^{2,4-6}

Demographic characteristics—Demographic variables collected in the NSDUH survey included: gender, age, education, income and marital status. Based on the observed distribution and given that age was collected as a categorical, rather than continuous variable in the NSDUH, age was categorized into approximate tertiles, using the levels of 18–25 years, 26–34 years, and greater than 35 years of age. Education status was grouped into the

following categories: less than high school, high school, some undergraduate school, and undergraduate/graduate school. Annual income levels consisted of < \$20,000, \$20,000–\$49,000, \$50,000–\$74,999 and > \$75,000. Marital status included: never married, divorced/separated and married.

Public health and social problems—Mental health characteristics included past year major depressive episode (MDE; depression). Depression symptoms were based on the criteria in the DSM-IV;³² that is, respondents were classified as having a MDE if they acknowledged having 5 of 9 criteria nearly every day for a two week period. More specifically, MDE questions for adults were adapted from the depression section of the National Comorbidity Survey-Replication.³³ Also, self-reported data were collected on social consequences, including past year STI, arrest or booking for breaking the law, and treatment or counseling for alcohol and/or drug use. In order to assess past year STI, participants were presented with a list of medical conditions, one of which was STI, and were asked the question “Which, if any of these conditions did a doctor or other medical professional tell you that you had in the past 12 months?”. Information on past year arrest was extrapolated from the following question: “Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking a law?”. Responses included “none,” being arrested “one time,” “two times,” or “three or more times.” Responses indicating past year arrest one or more times were combined to create a dichotomous variable, “arrested in the past year” versus “not arrested in the past year.” Information regarding uptake of past year alcohol and/or drug treatment was assessed using the following question: “During the past 12 months, that is since [DATEFILL] have you received treatment or counseling for your use of alcohol or any drug, not counting cigarettes?” Responses were dichotomous (yes/no).

Statistical Analysis

Analyses were conducted in STATA 10.0 taking into account the weights and complex sampling design (stratification and clustering).³⁴ Specifically, Taylor series estimation methods were used to obtain proper standard error estimates. Descriptive statistics by race/ethnicity of demographics variables were calculated using percentages and their standard errors. Overall Chi-square tests were used to determine whether differences in demographics, MDE, and adverse consequences in substance use disorders existed by race/ethnicity. Subsequently, pair-wise chi-squares using a Bonferroni correction were used to determine specific differences by race/ethnicity. Multinomial regression was used to establish the relationship between alcohol use disorder, marijuana use disorder and co-occurring alcohol and marijuana use disorder and correlates: demographics, MDE, STI and social problems, while statistically controlling for gender, age, marital status, income, education, and cocaine use disorder. Hypotheses tests were two-sided and tested at a Bonferroni-corrected alpha level of 0.02.

Results

Sample characteristics

The majority of the sample reported White race (75%), followed by Hispanic ethnicity (14%), and African American race (11%). Results demonstrate that respondents with alcohol use disorder, marijuana use disorder, or co-occurring alcohol and marijuana use disorder are most likely to be male, with male gender more predominant in Hispanics compared to African Americans, $\chi^2(1, N = 3,468) = 672.85, p = 0.0021$ and Whites, $\chi^2(1, N = 12,409) = 540.18, p = <0.0001$. For all racial/ethnic categories, respondents were more likely to be 18–25 years of age or greater than 34 years of age. However, Hispanics were more likely to be younger as compared to Whites, $\chi^2(2, N = 12,409) = 1181.62, p = <0.0001$, or African

Americans, $\chi^2(2, N = 3,468) = 890.30, p = 0.0113$. For all race/ethnicity categories, respondents were more likely to be single compared to married or divorced/separated. Furthermore, African Americans were more likely to be single compared to Whites, $\chi^2(2, N = 11,867) = 1320.03, p < 0.0001$, and Hispanics, $\chi^2(2, N = 3,468) = 1780.61, p = 0.0004$. Most respondents reported their income to be \$20,000 to \$49,999 ($SE = 0.66$). However, Whites were more likely to report higher income as compared to African Americans, $\chi^2(3, N = 11,867) = 4161.96, p < 0.0001$, or Hispanics, $\chi^2(3, N = 12,409) = 1921.95, p < 0.0001$. Similarly, Whites reported higher education than African Americans, $\chi^2(2, N = 11,867) = 2088.49, p < 0.0001$, or Hispanics, $\chi^2(2, N = 12,409) = 6784.49, p < 0.0001$. Descriptive statistics can be found in Table 1.

Single and co-occurring alcohol and marijuana use disorders varied by race/ethnicity

Estimates of alcohol and marijuana use disorders in this sample were high. Eighty-seven percent of participants had a single alcohol use disorder, while 12.18% had a single marijuana use disorder, and 8.75% had a co-occurring alcohol and marijuana use disorder. Alcohol use disorders were more likely to be reported among Whites than African Americans, $\chi^2(1, N = 11,867) = 1062.90, p < 0.0001$, and more likely among Hispanics as compared to African Americans, $\chi^2(1, N = 3,468) = 2260.68, p < 0.0001$. Alcohol use disorders were similar among Whites and Hispanics, $\chi^2(1, N = 12,409) = 19.44, p = 0.2838$. African Americans were more likely to report marijuana use disorders than Whites, $\chi^2(1, N = 11,867) = 1401.45, p < 0.0001$ and Hispanics, $\chi^2(1, N = 3,468) = 2605.30, p < 0.0001$. Co-occurring alcohol and marijuana use disorders were more likely among African Americans as compared to Whites, $\chi^2(1, N = 11,867) = 643.67, p < 0.0001$ and Hispanics, $\chi^2(1, N = 3,468) = 715.37, p = 0.0007$.

Other drug use disorders vary by race/ethnicity

Estimates of drug use disorders (i.e., abuse and/or dependence) for substances other than alcohol or marijuana in this sample were relatively low. The most prevalent was cocaine use disorder (3.36%). Additionally, cocaine use disorder was the only other drug use disorder to differ significantly between races, $\chi^2(2, N = 13,872) = 403.76, p = 0.0005$. Information on drug use disorders stratified by race/ethnicity can be found in Table 2.

Public health and social problems vary by race/ethnicity

Whites—Table 3 lists the estimates of past year MDE and adverse consequences by alcohol use disorder, marijuana use disorder and co-occurring alcohol and marijuana use disorder. For Whites, past year MDE varied significantly between the single and co-occurring use disorders, and was most prevalent among individuals with marijuana use disorder, $\chi^2(2, N = 10,321) = 481.01, p = 0.001$. However, past year STI was most common among individuals with co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 13,872) = 167.86, p = 0.0013$. Past year history of arrest also varied by drug use disorder, and was most prevalent among respondents with co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 10,321) = 1661.58, p < 0.0001$. Also, the frequency of past year treatment for alcohol or drugs was most common among respondents with or co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 10,321) = 574.60, p < 0.0001$.

African Americans—Past year MDE varied by drug use disorder among African Americans, and was more prevalent among respondents with co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 1,448) = 1373.25, p = 0.0122$. History of being arrested was also most prevalent in respondents with co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 1,448) = 3514.83, p < 0.0001$.

Hispanics—Among Hispanics, neither past year MDE nor STI history differed by use status. History of being arrested, however, was most prevalent among respondents with co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 1,983) = 4820.47, p < 0.0001$. Past year treatment for alcohol or drug abuse was more prevalent among Hispanics reporting co-occurring alcohol and marijuana use disorder, $\chi^2(2, N = 2,005) = 1185.34, p = 0.0093$...

Public health and social problems vary by single and co-occurring use disorder within race/ethnicity: Results from the multinomial regression

Whites—Results of the multinomial regression model are listed in Table 4. Whites reporting past year MDE were approximately 40% less likely to report having an alcohol use disorder than they were to report having a marijuana use disorder (AOR=0.60, 98% CI=0.40, 0.90). Compared to co-occurring alcohol and marijuana use disorder, Whites with past year arrest(s) were 48% less likely (AOR=0.52, 98% CI=0.34, 0.81) to report single alcohol use disorder. Among Whites, neither STI nor arrest history were associated with disorder status.

African Americans—African American respondents with past year MDE were 74% less likely to report having a single alcohol use disorder than they were to report having a co-occurring alcohol and marijuana use disorder (AOR=0.26, 98% CI=0.09, 0.71), and were 76% less likely to report having a single marijuana use disorder as compared to a co-occurring use disorder (AOR=0.24, 98% CI=0.09, 0.65). Past year STI was 4.67 times more likely among African Americans reporting an alcohol use disorder as compared to those reporting a co-occurring alcohol and marijuana use disorder (98% CI=1.03–21.12). History of being arrested was 53% less likely (AOR=0.47, 98% CI=0.23, 0.98) for African American respondents with an alcohol use disorder as compared to respondents with a co-occurring use disorder. Among African Americans, there was no relationship between treatment for alcohol or drugs and any particular disorder status.

Hispanics—Among Hispanics, neither past year MDE, STI history, arrest history, nor treatment history was associated with disorder status.

Discussion

Hypotheses regarding variation of alcohol, marijuana, and co-occurring alcohol and marijuana use disorders by race/ethnicity category were largely validated by the findings of this study. Many of these findings are also supported by prior literature, in that the frequency of alcohol use disorder was greater for Whites as compared to African Americans.⁹ Additionally, marijuana use disorders were most common among African Americans, as compared to Whites or Hispanics.^{9,23,35–36} Also consistent with our hypotheses, African American participants were found to report co-occurring alcohol and marijuana use disorders significantly more frequently than either White or Hispanic participants. Additionally, when briefly examining the variation of drug use disorders, other than alcohol or marijuana, by race/ethnicity we found that overall, the presence of other drug use disorders was quite low (i.e., cocaine use disorder was the most prevalent, including only 3.36% of the total sample). Furthermore, cocaine use disorder was the only other drug use disorder to differ by race/ethnicity.

A novel approach, and subsequent findings, of the study included the examination of racial/ethnic differences in the association between alcohol, marijuana, and co-occurring alcohol and marijuana use disorders and public health and social problems. In the multinomial regression model, we observed that Whites with past year MDE were more likely to have a marijuana use disorder than an alcohol use disorder, a finding generally unrecognized in

clinical settings. This finding could have implications for the promotion of additional counseling and treatment for MDE among Whites seeking treatment for marijuana use disorders. Consistent with our hypothesis that adverse correlates would be more likely among individuals with co-occurring use disorders, African Americans with past year MDE were more likely to have a co-occurring alcohol and marijuana use disorder than either a single alcohol use disorder or marijuana use disorder. However, among Hispanics, no association between particular use disorder and MDE was apparent. Previous research indicates that presentation and interpretation of symptoms of mental disorders might differ according to race/ethnicity,³⁷ thus, there is the possibility that the Hispanics in our sample are experiencing a different presentation of depressive symptomatology, or are interpreting such symptoms differently.³⁸⁻⁴³

Similar to findings from past research, history of STI was most common among African Americans in this sample.²⁸⁻²⁹ In addition, in the adjusted model, past year STI was far more common among African Americans with a co-occurring use disorder than among those with a single alcohol use disorder. This finding is also consistent with prior research showing that co-occurring substance use disorders increase the likelihood of contracting an STI.^{10,20-22} It is possible that the co-occurring use of alcohol and marijuana could result in impaired cognition, which could facilitate risky sexual behaviors resulting in contraction of STI, above and beyond that of alcohol use disorder alone among this group of African Americans.

Consistent with observations in the general population of the United States,³⁰ a higher history of arrest was found for African Americans in the present study. Past-year arrest was found to be higher for African Americans than for Whites, though similar to the rates for Hispanics. Consistent with our hypothesis, among both Whites and African Americans, past year history of arrest was more common among individuals with a co-occurring alcohol and marijuana use disorder than among individuals with a single alcohol use disorder.

Although it is possible that drug use disorders other than alcohol and/or marijuana may have had associations with the various demographic and mental health variables reported in the paper, we believe that this is unlikely in the present sample. A brief examination indicated that other drug use disorders (i.e., not alcohol and/or marijuana use disorders) were relatively uncommon. Furthermore, estimates of only one drug use disorder, cocaine use disorder, differed by race/ethnicity. As a result, cocaine use disorder was included as a covariate in our adjusted final model.

Limitations of this study should be noted. The NSDUH has a cross-sectional design which prevented determination of causal inferences regarding the temporal order of substance disorders and correlates. Additionally, data on other common comorbid psychiatric disorders (e.g., such as antisocial personality disorder and generalized anxiety disorder) were limited in the NSDUH, insofar as information regarding DSM-IV criteria were not collected for those disorders, and thus could not be included in the present analyses. An additional limitation of the present study includes potential differences between prevalence estimates from the NSDUH and those obtained by clinicians. In a clinical validation study, Jordan and colleagues (2008) demonstrated that in comparison to a clinician-administered Structured Clinical Interview for DSM-IV (SCID-IV),⁴⁴ criteria utilized by the NSDUH generally tends to produce false positives, with a few exceptions. For instance, it was also suggested that the NSDUH criteria tends to underestimate the prevalence of adult marijuana dependence.⁴⁵ As a result, it is possible that prevalence estimate findings from the present study represent either an over- or under-approximation, depending upon the substance use disorder in question, as compared to what a clinician might find. Furthermore, data were obtained via self report, and therefore, may be prone to bias due to stigmas associated with drug use,

mental health or social consequences.³¹ However, the 2005–2007 NSDUH studies incorporated audio computer assisted self-interviewing technology (ACASI), thereby increasing study validity.^{2,4–6,46}

Strengths of this study included a nationally representative sample, which allowed generalization of study findings to the U.S. population of adult respondents with substance use disorders. Also, study results provided frequency estimates of alcohol use disorders, marijuana use disorders, and co-occurring alcohol and marijuana use disorders by race/ethnicity and allowed for the comparison between individuals with single versus co-occurring alcohol and marijuana use disorder by race/ethnicity. Differences found in terms of demographics, MDE, adverse consequences and treatment history may be used to inform both prevention and treatment services. This is especially warranted given that individuals with both alcohol use disorder and marijuana use disorder have been known to be less likely to suspend drug use and more likely to be readmitted to treatment compared to individuals with only alcohol use disorder or marijuana use disorder.^{18,47}

Although the results of this study indicated distinct differences between individuals with alcohol or drug versus co-occurring alcohol and drug use disorders, the history of substance abuse treatment has focused on treatment of single versus dual diagnoses of substance use disorder. The prevention of substance use disorders may need to move away from a single disorder focus and instead include systematic assessment of co-occurring disorders.⁴⁸ Furthermore, treatment trials may wish to recruit individuals with co-occurring substance use disorders in order to improve generalizability.

Further implications of study results suggest that an important part of substance abuse prevention or treatment should also include the screening and assessment of psychiatric disturbances.^{22,49} Our results indicate that this is especially pertinent to Whites with marijuana use disorder who may have a higher frequency of MDE. Furthermore, treatment programs may need to be tailored to meet the needs of individuals with co-occurring substance use disorders and psychiatric comorbidity. That is, substance use and psychiatric services should be a part of an integrated treatment plan.²²

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References

1. Pleis JR, Lucas JW, Ward BW. Summary health statistics for U.S. adults: National Health Interview Survey, 2008. National Center for Health Statistics. *Vital Health Stat.* 2009; 10(242)
2. Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2007. 2007
3. Compton WM, Grant BF, Colliver JD, Glantz MD, Stinson FS. Prevalence of marijuana use disorders in the United States: 1991–1992 and 2001–2002. *JAMA.* 2004; 291(17):2114–2121. [PubMed: 15126440]

4. Substance Abuse and Mental Health Services Administration. Results from the 2005 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2006.
5. Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2008.
6. Substance Abuse and Mental Health Services Administration. Results from the 2008 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2009.
7. Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991–1992 and 2001–2002. *Drug Alcohol Depend.* 2004; 74:223–234. [PubMed: 15194200]
8. Anthony, JC.; Helzer, JE., editors. *Psychiatric Disorders in America*. Free Press; New York, NY: 1991.
9. Anthony JC, Warner LA, Kessler RC. Comparative epidemiology of dependence on tobacco, alcohol, controlled substance, and inhalants: basic findings from the National Comorbidity Survey. Comparative epidemiology of dependence on tobacco, alcohol, controlled substance, and inhalants: basic findings from the National Comorbidity Survey. *Exp Clin Psychopharmacol.* 1994; 2:224–268.
10. Midanik LT, Tam TW, Weisner C. Concurrent and simultaneous drug and alcohol use: results of the 2000 National Alcohol Survey. *Drug Alcohol Depend.* 2007; 90(1):72–80. [PubMed: 17446013]
11. Shillington AM, Clapp JD. Substance use problems reported by college students: combined marijuana and alcohol use versus alcohol-only use. *Subst Use Misuse.* 2001; 36(5):663–672. [PubMed: 11419493]
12. Aharonovich E, Liu X, Samet S, Nunes E, Waxman R, Hasin D. Postdischarge cannabis use and its relationship to cocaine, alcohol, and heroin use: a prospective study. *Am J Psychiatry.* 2005; 162:1507–1514. [PubMed: 16055773]
13. Skinstad AH, Swain A. Comorbidity in a clinical sample of substance users. *American J Drug Alc Abuse.* 2001; 27(1):45–64.
14. Smith SM, Stinson FS, Dawson DA, Goldstein R, Huang B, Grant BF. Race/ethnic differences in the prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Psychological Medicine.* 2006; 36(7):987–998. [PubMed: 16650344]
15. Kandel DB, Huang FY, Davies M. Comorbidity between patterns of substance use dependence and psychiatric syndromes. *Drug Alcohol Depend.* 2001; 64(2):233–241. [PubMed: 11543993]
16. Regier DA, Farmer ME, Rae DS, et al. Comorbidity of mental disorders with alcohol and other drug abuse: results from the Epidemiologic Catchment Area [ECA] Study. *JAMA.* 1990; 264(19):2511–2518. [PubMed: 2232018]
17. Merickangas KR, Mehta RL, Molnar BE, et al. Comorbidity of substance use disorders with mood and anxiety disorders: results of the International Consortium in Psychiatric Epidemiology. *Addictive Behaviors.* 1998; 23(6):893–907. [PubMed: 9801724]
18. Karno MP, Grella CE, Niv N, Warda U, Moore AA. Do substance type and diagnosis make a difference? A study of remission from alcohol- versus drug-use disorders using the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Studies on Alcohol and Drugs.* 2008; 69(4):491–495. [PubMed: 18612563]
19. Petry NM. A behavioral economic analysis of polydrug abuse in alcoholics: asymmetrical substitution of alcohol and cocaine. *Drug Alcohol Depend.* 2001; 62:31–39. [PubMed: 11173165]
20. Sacks S, Cleland CM, Melnick G, et al. Violent offenses associated with co-occurring substance use and mental health problems: evidence from CJDATS. *Behav Sci Law.* 2009; 27(1):51–69. [PubMed: 19156677]
21. Agrawal A, Lynskey MT, Madden PA, Bucholz KK, Heath AC. A latent class analysis of illicit drug abuse/dependence: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Addiction.* 2007; 102(1):94–104. [PubMed: 17207127]

22. Buckley PF. Prevalence and consequences of the dual diagnosis of substance abuse and severe mental illness. *J Clin Psychiatry*. 2006; 67(Suppl 7):5–9. [PubMed: 16961418]
23. Stinson FS, Grant BF, Dawson DA, Ruan WJ, Huang B, Saha T. Comorbidity between DSM-IV alcohol and specific drug use disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug Alcohol Depend*. 2005; 80(1): 105–116. [PubMed: 16157233]
24. Staines GL, Magura S, Foote J, Deluca A, Kosanke N. Polysubstance use among alcoholics. *J Addict Dis*. 2001; 20(4):53–69. [PubMed: 11760926]
25. Perron BE, Mowbray OP, Glass JE, et al. Differences in service utilization and barriers among Blacks, Hispanics, and Whites with drug use disorders. *Substance Abuse Treatment, Prevention, and Policy*. 2009; 4:3.
26. Hatzenbuehler ML, Keyes KM, Narrow WE, Grant BF, Hasin DS. Racial/ethnic disparities in service utilization for individuals with co-occurring mental health and substance use disorders in the general population: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2008; 69(7):1112–1121. [PubMed: 18517286]
27. Lundgren L, Amodeo M, Ferguson F, Davis K. Racial and ethnic differences in drug treatment entry by injection drug users in Massachusetts, 1996–1999. *J Subst Abuse Treat*. 2001; 21(3):145–153. [PubMed: 11728788]
28. Haverkos HW, Turner JF Jr, Moolchan ET, Cadet JL. Relative rates of AIDS among racial/ethnic groups by exposure categories. *Journal of the National Medical Association*. 1999; 91(1):17–24. [PubMed: 10063784]
29. Blankenship KM, Smoyer AB, Bray SJ, Mattocks K. Black-white disparities in HIV/AIDS: the role of drug policy and the corrections system. *J Health Care Poor Underserved*. 2005; 16(4 Suppl B):140–156. [PubMed: 16327113]
30. Harrison, PM.; Beck, AJ. [Accessed on October 4, 2010] Prison and Jail Inmates at Midyear 2005, Bureau of Justice Statistics site. <http://bjs.ojp.usdoj.gov/content/pub/pdf/pjim05.pdf/>.
31. Snodgrass, JA.; Grau, EA.; R.A.C.. National Household Survey on Drug Abuse: changes in race and ethnicity questions. Substance Abuse and Mental Health Services Administration; Rockville, MD: 1999–2001.
32. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. APA; Washington, DC: 1994.
33. National Comorbidity Survey (NCS). National Comorbidity Survey Replication (NCS-R). [Accessed January 18, 2011] <http://www.hcp.med.harvard.edu/ncs/>.
34. StataCorp. *Stata Statistical Software: Release 10.0*. Stata Corporation; College Station, Texas: 2007.
35. Chen K, Kandel D. Relationship between extent of cocaine use and dependence among adolescents and adults in the United States. *Drug Alcohol Depend*. 2002; 68(1):65–85. [PubMed: 12167553]
36. Grant BF, Hartford TC. Comorbidity between DSM-IV alcohol use disorders and major depression: results of a national survey. *Drug Alcohol Depend*. 1995; 39(3):197–206. [PubMed: 8556968]
37. Baker FM, Bell CC. Issues in the Psychiatric Treatment of African Americans. *Psychiatr Serv*. 1999; 50:362–368. [PubMed: 10096640]
38. Mezzich J, Raab E. Depressive symptomatology across the Americas. *Arch Gen Psychiatry*. 1980; 37:818–23. [PubMed: 7396661]
39. Escobar J, Gomez J, Tuason V. Depressive symptomatology in North and South American patients. *Am J Psychiatry*. 1983; 140:47–51. [PubMed: 6847984]
40. Kolody B, Vega W, Meinhardt K, Bensussen G. The correspondence of health complaints and depressive symptoms among Anglos and Mexican-Americans. *J Nerv Ment Dis*. 1986; 174:221–28. [PubMed: 3958703]
41. Canino GJ, Bird HR, Shrout PE, et al. The prevalence of specific psychiatric disorders in Puerto Rico. *Arch Gen Psychiatry*. 1987; 44:727–35. [PubMed: 3498456]
42. Canino IA, Rubio-Stipec M, Canino G, Escobar JI. Functional somatic symptoms: a cross-ethnic comparison. *Am J Orthopsychiatry*. 1992; 62:605–12. [PubMed: 1443069]

43. Lewis-Fernandez R, Das AK, Alfonso C, Weissman MM, Olfson M. Depression in US Hispanics: Diagnostic and management considerations in family practice. *J Am Board Fam Med.* 2005; 18(4): 282–296.
44. First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured clinical interview for DSMIV-TR Axis I disorders, Research Version, Non-patient Edition. (SCID-I/NP). Biometrics Research, New York State Psychiatric Institute; New York: 2002.
45. Jordan BK, Karg RS, Batts KR, Epstein JF, Wiesen C. A clinical validation of the National Survey on Drug Use and Health assessment of substance use disorders. *Addictive Behaviors.* 2008; 33:782–798. [PubMed: 18262368]
46. Macalino GE, Celentano DD, Latkin C, Strathdee SA, Vlahov D. Risk behaviors by audio computer-assisted self-interviews among HIV-seropositive and HIV-seronegative injection drug users. *AIDS Educ Prev.* 2002; 14:367–378. [PubMed: 12413183]
47. Ives R, Ghelani P. Polydrug use [the use of drugs in combination]: a brief review. *Drugs Educ Prev Pol.* 2006; 13(3):225–232.
48. Rounsaville BJ, Petry NM, Carroll KM. Single versus multiple drug focus in substance abuse clinical trials research. *Drug Alcohol Depend.* 2003; 70(2):117–125. [PubMed: 12732403]
49. Kavanaugh DJ, Connolly JM. Interventions for co-occurring addictive and other mental disorders [AMDs]. *Addictive Behaviors.* 2009; 9:838–845.

TABLE 1

Characteristics of Adults with Substance Use Disorder by Racial/Ethnic Category, NSDUH 2005–2007
(Unweighted N = 13,872).

Characteristic	Total, % ^a (SE) ^b	White, % (SE)	African American, % (SE)	Hispanic, % (SE)
	N = 13,872; 100%	N = 10,404; 74.57%	N = 1,463; 11.46%	N = 2,005; 13.96%
Male	68.26 (0.59)	66.77 (0.69) ^A	68.45 (1.57) ^A	76.08 (1.83) ^B
Age				
18–25	34.90 (0.53)	34.77 (0.65) ^A	32.00 (1.66) ^B	37.98 (1.71) ^C
26–34	22.14 (0.64)	20.03 (0.67)	26.44 (2.02)	29.88 (2.22)
>34	42.95 (0.86)	45.19 (0.95)	41.56 (2.24)	32.13 (2.23)
Marital Status				
Married	31.92 (0.93)	34.06 (1.14) ^A	19.06 (1.72) ^B	31.03 (1.96) ^C
Single	53.79 (0.93)	51.12 (1.04)	66.20 (1.92)	57.86 (2.06)
Divorced or Separated	14.29 (0.60)	14.82 (0.75)	14.74 (1.93)	11.11 (1.52)
Income				
<\$20,000	23.86 (0.70)	20.41 (0.70) ^A	39.69 (2.23) ^B	29.33 (2.22) ^C
\$20,000–49,999	34.45 (0.69)	32.29 (0.76)	40.17 (2.33)	41.29 (2.05)
\$50,000–74,999	15.34 (0.54)	16.64 (0.63)	9.46 (1.13)	13.24 (1.20)
>\$75,000	26.36 (0.73)	30.67 (0.89)	10.68 (1.30)	16.13 (1.80)
Education				
<High School	16.93 (0.50)	12.00 (0.49) ^A	24.27 (1.67) ^B	37.23 (1.82) ^C
High School	31.22 (0.60)	30.83 (0.77)	36.42 (2.37)	29.00 (1.54)
College	51.86 (0.72)	57.17 (0.81)	39.31 (2.29)	33.77 (2.29)
Past Year Major Depressive Episode ^c	15.67 (0.52)	15.91 (0.61) ^A	15.96 (1.65) ^A	14.19 (1.58) ^A
Past Year STI ^d	2.60 (0.21)	2.32 (0.23) ^A	4.66 (0.67) ^B	2.45 (0.54) ^A
Past Year Arrest	16.24 (0.52)	14.06 (0.62) ^A	23.74 (1.75) ^B	21.55 (1.67) ^B
Past Year Treatment for Alcohol or Drugs	8.35 (0.43)	8.12 (0.52) ^A	9.03 (1.10) ^A	9.04 (1.02) ^A
Alcohol Use Disorder	86.99 (0.41)	87.99 (0.50) ^A	77.73 (1.65) ^B	89.22 (0.91) ^A
Alcohol Abuse ^c	50.23 (0.64)	52.38 (0.77) ^A	38.94 (2.06) ^B	47.99 (1.82) ^A
Alcohol Dependence ^c	36.76 (0.76)	35.61 (0.86) ^A	38.79 (2.11) ^{AB}	41.22 (1.74) ^B
Marijuana Use Disorder	12.18 (0.43)	10.98 (0.46) ^A	22.43 (1.63) ^B	10.18 (0.98) ^A
Marijuana Abuse ^c	3.96 (0.23)	3.47 (0.22) ^A	6.82 (1.12) ^B	4.26 (0.84) ^{AB}
Marijuana Dependence ^c	8.21 (0.39)	7.51 (0.41) ^A	15.61 (1.29) ^B	5.92 (0.61) ^A
Co-occurring Alcohol and Marijuana Use Disorder ^e	8.75 (0.30)	7.85 (0.34) ^A	14.47 (1.35) ^B	8.87 (1.06) ^A
Alcohol Abuse and Marijuana Abuse	1.85 (0.15)	1.79 (0.18) ^A	2.65 (0.59) ^A	1.53 (0.29) ^A
Alcohol Abuse and Marijuana Dependence	2.08 (0.17)	1.89 (0.19) ^A	3.87 (0.87) ^B	1.64 (0.41) ^A
Alcohol Dependence and Marijuana Abuse	1.53 (0.15)	1.21 (0.13) ^A	2.90 (0.98) ^{AB}	2.12 (0.73) ^{AB}
Alcohol Dependence and Marijuana Dependence	3.29 (0.20)	2.96 (0.22) ^A	5.05 (0.64) ^B	3.58 (0.70) ^{AB}

Categories that do not share superscripts (A, B, or C) refer to statistically significant differences between categories at a Bonferroni corrected alpha of 0.02

^a represents weighted column percentages

^b SE = standard error

^c defined using the criteria listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994)

^d STI = sexually transmitted infection;

^e co-occurring substance use disorder is defined as meeting abuse or dependence criteria for both alcohol and marijuana; Co-occurring alcohol abuse and/or dependence *and* marijuana abuse and/or dependence

Table 2

Drug Use Disorders for Substances other than Alcohol or Marijuana by Racial/Ethnic Category, NSDUH 2005–2007 (Unweighted $N = 13,872$).

Characteristic	Total, % ^b (SE) ^c	White, % (SE)	African American, % (SE)	Hispanic, % (SE)	χ^2 (df)	p-value
Drug use disorders ^a						
Pain relievers	2.65(0.17)	2.00(0.14)	0.25(0.07)	0.39(0.10)	10.60(2)	0.7870
Cocaine	3.36(0.26)	2.02(0.15)	0.55(0.12)	0.78(0.16)	403.76(2)	0.0005
Hallucinogens	0.89(0.001)	0.64(0.07)	0.13(0.03)	0.13(0.06)	8.44(2)	0.7323
Heroin	0.42(0.0007)	0.27(0.04)	0.05(0.03)	0.10(0.05)	42.52(2)	0.3808
Inhalants	0.16(0.0005)	0.10(0.04)	0.02(0.01)	0.04(0.03)	11.47(2)	0.6971
Sedatives	0.20(0.0004)	0.16(0.04)	0.02(0.01)	0.01(0.01)	14.42(2)	0.4669
Stimulants	0.74(0.0009)	0.60(0.07)	0.02(0.01)	0.12(0.07)	55.55(2)	0.3262
Tranquilizers	0.83(0.10)	0.64(0.07)	0.10(0.05)	0.09(0.04)	5.96(2)	0.8654

^a Abuse and/or dependence

^b Represents weighted column percentages

^c SE = standard error

TABLE 3
Prevalence of Comorbidities of Substance Use Disorder by Racial/Ethnic Category, NSDUH 2005–2007 (Unweighted $N = 13,872$).

Characteristic	Alcohol Use Disorder ^a Column % (SE) ^d	Marijuana Use Disorder ^b Column % (SE)	Co-occurring Alcohol and Marijuana Use Disorder ^c Column % (SE)	χ^2 (df)	p-value
<i>White</i>					
<i>Post Year</i>					
Major Depressive Episode ^e	14.89 (0.65)	22.65 (2.04)	19.02 (2.50)	481.01(2)	.0001
STI ^f	2.13 (0.27)	2.81 (0.46)	5.09 (1.08)	167.86(2)	.0013
Arrest History	12.27 (0.67)	21.47 (1.59)	30.09 (3.40)	1661.58(2)	<.0001
Treatment for Alcohol or Drugs	7.29 (0.56)	11.89 (1.19)	15.09 (2.65)	574.60(2)	<.0001
<i>African American</i>					
<i>Past Year</i>					
Major Depressive Episode	15.51 (1.97)	12.87 (2.20)	31.27 (7.50)	1373.25(2)	.0122
STI	4.42 (0.87)	5.41 (1.65)	4.64 (2.22)	38.65(2)	.8326
Arrest History	18.76 (1.79)	34.82 (4.32)	39.46 (6.69)	3514.83(2)	<.0001
Treatment for Alcohol or Drugs	8.00 (1.23)	11.76 (2.60)	10.90 (3.01)	333.83(2)	.2149
<i>Hispanic</i>					
<i>Past Year</i>					
Major Depressive Episode	13.78 (1.79)	15.43 (4.07)	19.37 (5.84)	123.19(2)	.6122
STI	2.37 (0.61)	2.87 (1.06)	3.27 (1.97)	21.64(2)	.8154
Arrest History	17.97 (1.61)	37.40 (6.34)	51.73 (9.21)	4820.47(2)	<.0001
Treatment for Alcohol or Drugs	7.84 (1.03)	14.36 (3.86)	20.11 (6.44)	1185.34(2)	.0093

^a alcohol abuse and/or dependence

^b marijuana abuse and/or dependence

^c meeting abuse or dependence criteria for both alcohol and marijuana

^d SE = standard error

^e defined using the criteria listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994)

^f STI = sexually transmitted infection

TABLE 4

Adjusted Odds Ratios and 98% Confidence Intervals by Racial/Ethnic Category, NSDUH 2005–2007
(Unweighted $N=13,872$).

Characteristic	Alcohol Use Disorder ^a vs. Co-Occurring Alcohol and Marijuana Use Disorder	Marijuana Use Disorder ^e vs. Co-Occurring Alcohol and Marijuana Use Disorder	Alcohol Use Disorder vs. Marijuana Use Disorder
	AOR ^c (98% CI) ^d	AOR (98% CI)	AOR (98% CI)
<i>White</i>			
<i>Past Year</i>			
Major Depressive Episode ^f	0.76 [0.47, 1.23]	1.26 [0.70, 2.28]	0.60 [0.40, 0.90] [*]
STI ^g	0.54 [0.26, 1.13]	0.69 [0.30, 1.56]	0.79 [0.47, 1.33]
Arrest History	0.52 [0.34, 0.81] [*]	0.68 [0.42, 1.08]	0.77 [0.58, 1.02]
Treatment for Alcohol or Drugs	0.61 [0.32, 1.67]	0.75 [0.38, 1.50]	0.81 [0.54, 1.21]
<i>African American</i>			
<i>Past Year</i>			
Major Depressive Episode	0.26 [0.09, 0.71] [*]	0.24 [0.09, 0.65] [*]	1.07 [0.60, 1.89]
STI	4.67 [1.03, 21.12] [*]	4.38 [0.90, 21.29]	1.07 [0.35, 3.22]
Arrest History	0.47 [0.23, 0.98] [*]	0.75 [0.34, 1.67]	0.63 [0.35, 1.12]
Treatment for Alcohol or Drugs	0.99 [0.32, 3.01]	1.67 [0.61, 4.58]	0.59 [0.23, 1.49]
<i>Hispanic</i>			
<i>Past Year</i>			
Major Depressive Episode	0.65 [0.19, 2.15]	0.73 [0.19, 2.86]	0.88 [0.31, 2.50]
STI	1.35 [0.17, 10.73]	1.18 [0.12, 11.86]	1.14 [0.25, 5.23]
Arrest History	0.43 [0.18, 1.01]	0.70 [0.21, 2.35]	0.61 [0.27, 1.36]
Treatment for Alcohol or Drugs	0.49 [0.15, 1.56]	0.69 [0.20, 2.39]	0.71 [0.20, 2.48]

Notes:

^{*} $p < .02$

^a alcohol abuse and/or dependence

^b meeting abuse or dependence criteria for both alcohol and marijuana

^c AOR = adjusted odds ratio (adjusted for gender, age, marital status, income, education, and cocaine use disorder)

^d CI = 98% confidence interval

^e marijuana abuse and/or dependence

^f defined using the criteria listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994)

^g STI = sexually transmitted infection