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Intercorrelation of Alcohol and Other Drug Use Disorders among a National Sample of Drivers

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Abstract

This study examined the relationship between alcohol, marijuana, cocaine, and pain killer use disorders in a sample of drivers. We studied nighttime drivers aged 16 to 87 (*n* = 4,277) from the 2007 National Roadside Survey who reported substance use behaviors and provided breath tests for alcohol. Logistic regression analyses assessed the relationships between (a) substance (i.e., alcohol/marijuana/cocaine/pain killer) use disorders, (b) demographic characteristics, and (c) BAC levels. Overall, 13.2% of participants met criteria for marijuana use disorder; 7% met criteria for cocaine use disorder; and 15.4% met criteria for extra-medicinal pain killer use disorder. When self-report data were analyzed, three reciprocal associations emerged: (1) marijuana use disorders and alcohol use disorders were correlated; (2) marijuana use disorders and cocaine use disorders were correlated; and (3) cocaine use disorders and painkiller use disorders were correlated. BAC data revealed that marijuana and cocaine use disorders were both associated with positive BAC levels, but only cocaine use disorders were associated to BAC levels over the legal limit. Results suggest significant poly-substance use disorders in sample of nighttime drivers, with variations by demographic characteristics. The individual and public health consequences of multiple substance use disorders among drivers are significant.

Keywords

Substance Use disorder; Alcohol, Marijuana; Cocaine; Pain Killers

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In an ongoing national survey of persons aged 12 years or older in the United States (U.S.), the National Survey on Drug Use and Health (NSDUH) found the most commonly used illicit drugs among adults age 18–25 in the prior 30-days to be marijuana (19.8%), cocaine (1.7%), and non-medicinal use of pain killers (2.4%; SAMHSA, 2016). With such widespread use, questions of substance use during common daily activities in which substance-induced states may be detrimental to the safety of the individual or others, such as

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driving, become particularly relevant. Although the harmful effects of alcohol on driving performance have been thoroughly studied (e.g., Bernosky-Smith et al., 2011; Mann et al., 2010; Miller et al., 2009; Taylor & Rehm, 2011), the role of illicit substances on driving performance has received relatively little scientific attention.

In a study of stimulant users, Mann et al. (1993) found that cocaine users were 2–3 times more likely to be involved in automobile accidents than non-substance users. Further, young drivers (between 21–25 years of age) are approximately 2.5 times more likely to use marijuana and other drugs and drive rather than to drink alcohol and drive (Fergusson et al., 2008) and about 17% of teenagers reported having driven while under the influence of marijuana (Anderson et al., 2010). The use of opioid-based pain killers may result in reduced capacity for concentration, slowed information processing times, a reduction in object tracking, and poorer visual acuity (Leung, 2011). Although the use of any one of these substances while driving is enough to cause concern, poly-substance use and driving outcomes also need consideration. The use of more than one substance at a time enhances the effects that are felt when substances are used separately, what McCabe et al. (2006) call the “additive effect”. For instance, a pain killer is much more toxic when used with other drugs that depress the central nervous system then when taken alone (Cone et al., 2004).

Studies have found that alcohol use combined with drug use results in an increased probability of crash risk (Drummer et al., 2004; Hels et al., 2011; Movig et al., 2004). In a 2011 study of nine European countries who participated in the DRiving Under the Influence of Drugs (DRUID) study, Hels, et al. classified drivers who used “multiple drug combinations” in the highest crash risk category. Further, drivers who display positive blood alcohol content (BAC) are three to four times more likely to use marijuana and cocaine compared to those with a BAC = 0.0 (Voas et al., 2012). Simulation participants who used both marijuana and alcohol prior to driving displayed greater driving impairment than those who used only alcohol or marijuana (Downey et al., 2013).

Some studies have looked beyond substance use, to drivers who meet clinical criteria for substance use disorders. In one study, drivers who met clinical criteria for marijuana dependence were over 6.5 times more likely than those who did not meet criteria to also use cocaine and over 2.5 times more likely to use non-medicinal pain killers while driving (Scherer, Voas, & Furr-Holden, 2013). In another study of driver sex differences in opioid users, men were more likely than women to be dependent on opioids, though women were more likely to use non-medicinal pain killers (Back et al., 2011). Given that substance users are more prone to mistakes while driving than are non-users (Downey et al., 2013), research is needed that examines poly-substance use disorders and driving.

Investigations into multiple substance use disorders are needed given the prevalence. In a study using the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) sample, Stinson and colleagues (2005) found that when taking all drugs into account, 55.2% of persons with a 12-month drug use disorder also had a 12-month alcohol use disorder. Among adults with a 12-month alcohol use disorder, the prevalence of any 12-month drug use disorder was 13.05%; 9.89% had a cannabis use disorder; 2.51% had a cocaine use disorder; and 2.41% had an opioid use disorder (Stinson et al., 2005). Using data from the Collaborative Study of Genetics of Alcoholism, in a multi-site sample of patients in alcohol treatment programs, Dick et al (2007) found 52% of the alcohol-dependent sample to also meet DSM-IV criteria for an illicit drug dependence diagnosis: of those 71.5% met criteria for marijuana dependence; 58.5% met criteria for cocaine dependence; 18.5% met criteria for opioid dependence. Caetano and Weisner (1995) also found high rates of at least weekly use of marijuana (22–58%), cocaine/crack (24–56%), and codeine/other opiates (4–24%) in an adult alcohol-dependent treatment sample.

Given these rates of widespread and clinically significant poly-substance use, the impact of multiple substance disorders on activities such as driving is under-examined, in part due to the difficulty of obtaining such data. Rates of substance use among drivers is traditionally drawn from sources such as crash sites, hospital records, or arrests by police in which the driver is suspected of using substances. Although the practical considerations of using these populations present advantages, they also have the shortcoming of ignoring substance-using drivers who are not involved in accidents or met with legal complications. The existing literature paints an incomplete picture of substance use among drivers. To address this shortcoming in the U.S., the National Roadside Survey (NRS; Lacey et al., 2009a) gathered data from a random sample of drivers, including oral fluid samples and self-report measures of alcohol, marijuana, cocaine, and pain killer use disorders.

Gaining an accurate understanding of the prevalence of substance use disorders among drivers is vital for several reasons: (1) drivers who use multiple substances are at the highest risk for crash involvement (Downey et al., 2013; Drummer et al., 2004; Hels et al., 2011); (2) substance users–and persons who meet use disorder criteria–are more likely to make driving errors than non-substance users (Downey et al., 2013), and (3) there are high rates of concurrent alcohol and other drug use disorders in the general population (Dick et al., 2007; Hasin et al., 2007; Stinson et al., 2005). The NRS provides a unique opportunity to examine a sample of nighttime drivers, and is well-suited to gaining an understanding of the rates of multiple substance use disorders among drivers. Although any combination of substances may be of concern, the highest rates of substance use disorders are found among users of marijuana, cocaine, and pain killers (NSDUH, 2011), which are also the most commonly misused illicit substances in the U.S. (SAMHSA, 2004). In the present study, we examine the rates of concurrent use disorders of alcohol, marijuana, cocaine, and pain killers among a sample of nighttime drivers in the U.S..

Methods

Study Design and Sample

This study was a secondary analysis of the NRS conducted in 2007. The NRS was administered to day and nighttime weekend drivers in the 48 contiguous states and examined the prevalence of substance use disorders among drivers. A detailed description of the 2007 NRS can be found elsewhere (Lacey et al., 2009a; 2011). Participants of the 2007 NRS were randomly selected drivers at designated roadside survey stations (See Lacey et al., 2009a; 2011 for information on the sampling plan). Drivers were flagged down by police officers who directed them to off-road study personnel. Participants were informed that their selection in the study was random, they had done nothing wrong, and participation in the survey was both anonymous and confidential. Drivers who provided informed consent completed a 22-item interview assessing demographics, driving habits, and substance use behaviors and provided biological measurements including breath tests, oral fluid samples, and blood samples. Recruiting and survey procedures were approved by the Pacific Institute's Institutional Review Board.

Participants who agreed to participate were offered the opportunity to earn $5 for completing an alcohol use survey, and an additional $10 to provide oral fluid samples and complete a drug use survey. Finally, they were offered an additional $50 to provide a blood sample. Oral fluid and blood samples were used to screen for a variety of substances including marijuana, cocaine, and pain killers. It is feasible that drivers who refused to participate in the current study were under the influence of a substance and were subsequently reluctant to divulge information despite assurances of confidentiality. Drivers who refused to participate in the current study were offered an additional financial incentive of $150 to provide at least a breath test. Of these participants, approximately 50% agreed to provide a breath sample before departing, though no oral fluid or blood samples were collected nor were self-report measures administered.

Of the 10,909 eligible drivers (commercial drivers and drivers under 16 were not interviewed), 9,094 agreed to participate in the interview, 7,719 provided an oral fluid sample, and 7,882 responded to the drug questionnaire (Lacey 2009b). Of the 9,094 drivers who agreed to participate, 4,277 completed the alcohol use questionnaire and gave oral fluid and/or blood samples and were included in the current analysis. Participants who report having used any of the substances of interest in the current study in the prior year were counted as "Use," while those who met diagnostic criteria for a substance use disorder were additionally counted under "Use Disorder."

Measures

General Demographics.—Participant self-reported demographic information included age, sex, race, and highest education level attained. Age was categorized into four groups to be congruent with previous work by Voas et al. (2012): ˂21 years, ≥21 to ≤34 years, ≥35 to ≤44 years, and ≥45 years. For purposes of analyses, drivers were categorized as young (˂34 years of age) and old (≥34 years of age).

Substance Use History.—Participants self-reported whether they used alcohol, marijuana, cocaine or non-prescription pain killers in the prior year. Drivers who reported having used any of these substances were given additional questions to assess whether they met criteria for Substance Use Disorder as assessed by the instruments listed below.

Blood Alcohol Content.—Study personnel obtained data on blood alcohol content (BAC) using a passive alcohol sensor device and later with a preliminary breath test device. To protect participant confidentiality, breath test results could not be read by the study personnel at the time of data collection, but were stored in the device and later linked to questionnaire data (see Lacey et al., 2009b). BAC was categorized as no measurable BAC (or negative BAC); BAC between zero and <0.08 (drivers who were under the legal alcohol limit); and greater than or equal to 0.08 (drivers who were at or over the legal alcohol limit).

Alcohol Use Disorders.—Alcohol use disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS; Grant & Dawson, 1997; Cottler et al., 1997; Pull et al., 1997). The AUDADIS is constructed to allow for one item per diagnostic symptom as classified by the Diagnostic and Statistical Manual–fifth edition (DSM-5; APA, 2013). Participants self-reported on 12 items assessing alcohol use in the past 12 months. Individual items utilized "yes" or "no" responses to indicate whether the statement is true of the participant's experience with alcohol use. The AUDADIS has demonstrated good internal validity and temporal stability (Grant et al., 1995) and been used to assess DSM-5 diagnostic criteria for alcohol use disorders (e.g., Agrawal, Heath, & Lynskey, 2012)

Drug Use Disorders.—Drug use disorders were assessed using the Drug Use Disorder (DUD) Questionnaire (Scherer, Furr-Holden, & Voas, 2013). The DUD is a self-report questionnaire developed to assess use disorder criteria for marijuana, cocaine, and extra-medicinal pain killer use. Participants were asked if they used marijuana, cocaine or non-prescription pain killers in the prior year. If they endorsed using one or more of these three substances, they completed a 12-item questionnaire for each of the substances they had used (i.e., if a participant endorsed using marijuana in the prior year he/she was asked to fill out the DUD for marijuana use). Participants completing the DUD answer 12 items with "yes" or "no" responses to indicate whether the statement is true of their particular substance use experience. The DUD has demonstrated adequate construct validity with participants endorsing marijuana, cocaine, and/or pain killer use disorders who have also screened positive for these substances in blood analysis consistent with DSM-5 diagnostic criteria (Scherer, Furr-Holden & Voas, 2013). As in the DSM-5, participants were labeled as meeting the criteria for substance use disorder if they answered "yes" to two or more of the items used in this scale.

Statistical Analyses

Apart from descriptive statistics, all analyses were weighted as described in Lacey et al. (2009a) to allow for the data to be nationally representative. A series of logistic regression analyses were conducted to determine relationships between (a) substance use disorders (i.e., alcohol/marijuana/cocaine/pain killer use disorders), (b) each substance use disorder and demographic characteristics, and (c) BAC levels and substance use disorders. Data were analyzed using SPSS v. 18.0 (SPSS Inc., Chicago, IL). Odds ratios were used to display the strength of association and significant estimates were reported for alphas levels below 0.05.

Results

The study sample ($n = 4{,}277$) ranged in age from 16 to 87 ($M_{age} = 34.22$, $sd = 14.22$) and the majority of the sample was male (63.4%) and identified as White (48.4%; Table 1). Of drivers who completed the AUDADIS, 2,702 also completed the DUD for marijuana ($n = 1{,}590$), cocaine ($n = 1{,}018$), or extra-medicinal pain killer ($n = 1{,}338$) use (see Table 1). For each substance respectively, 4.9% ($n = 210$) of those who completed the DUD for marijuana met criteria for marijuana use disorder; 2.2% ($n = 93$) of those who completed the DUD for cocaine met criteria for cocaine use disorder; and 4.8% (*n* = 206) who completed the DUD for extra-medicinal pain killer use met criteria for pain killer use disorder (Table 1).

Male drivers were significantly more likely than female drivers to meet diagnostic criteria for pain killer use disorder. Young drivers were more likely than old drivers to meet diagnostic criteria for both alcohol and marijuana use disorders. Finally, White drivers were more likely than Black drivers to meet diagnostic criteria for both alcohol and cocaine use disorders, while Black drivers were more likely than White drivers to meet diagnostic criteria for both marijuana and pain killer use disorders (Table 2).

Predictors of Poly-substance Use Disorders

Drivers who met AUDADIS criteria for alcohol use disorders were about 11 times more likely than drivers who did not meet AUDADIS criteria to also meet use disorder criteria for marijuana and vice versa (adjusted odds ratio [AOR] = 11.09; 95% confidence interval [CI] = 4.98–24.73 and AOR = 11.16; 95% CI = 5.11–24.38, respectively). Similarly, drivers who met DUD criteria for marijuana use disorder were more likely than drivers who did not meet DUD criteria to also meet use disorder criteria for cocaine and vice versa (AOR = 42.20, 95% CI = 13.61–130.92 and AOR = 26.96; 95% CI = 8.77–82.89, respectively). Finally, drivers who met DUD criteria for pain killer use disorder were more likely than drivers who did not meet DUD criteria to also meet use disorder criteria for cocaine and vice versa (AOR = 29.85; CI = 10.93–81.50 and AOR = 25.81; 95% CI = 9.88–67.40) (Table 2).

Drivers who were found to be over the legal limit of 0.08 BAC at the time of participation were twice as likely as negative BAC drivers to meet criteria for cocaine use disorder, but about a fourth as likely to meet criteria for extra-medicinal pain killer use disorder (AOR = 2.01; 95% CI = 1.52–2.66 and AOR = 0.24; 95% CI = 0.15–0.37, respectively). Also, drivers who had consumed alcohol but were not over the legal limit where about one and a half times more likely to meet criteria for marijuana use disorder than those who had negative BAC (AOR = 1.43; CI = 1.25–1.64) (Table 3).

Discussion

In this cross-sectional study, we examined the relationship between alcohol, marijuana, cocaine, and pain killer use disorders in a sample of nighttime drivers. When self-report data were analyzed, three reciprocal associations emerged: (1) marijuana use disorders and alcohol use disorders were correlated; (2) marijuana use disorders and cocaine use disorders were correlated; and (3) cocaine use disorders and painkiller use disorders were correlated. BAC data revealed that though marijuana use disorders and cocaine use disorders were both associated with positive BAC levels, only cocaine use disorders were associated to BAC levels over the legal limit. It is interesting that marijuana and pain killer use disorders were not correlated. This may be related to the use of marijuana to manage pain. That is, if participants are using marijuana to deal with pain, their use of pain killers may be reduced. Although such a phenomenon would not explain the entirety of this result, it may contribute. Future research could determine if such a relationship exists and, if so, the implications of this association.

Our findings build upon prior reports of substance use among driving samples (Scherer et al., 2013) and substance use disorders in the general population (Dick et al., 2007; Hasin et al., 2007; Stinson et al., 2005) to include prevalence data on substance use disorders in a sample of nighttime drivers. The individual and public health consequences of our findings are significant. The use of marijuana, cocaine, and extra-medicinal pain killers has been found to increase the risk of involvement in automobile crashes (Anderson, et al., 2010; Leung, 2011; Mann et al., 1993) and the propensity to drink alcohol and drive (Fergussen et al., 2008). Chronic poly-substance use compounds the psychological effects and potential toxicity of any one substance (McCabe et al., 2006) which increases the likelihood of involvement in accidents, such as motor vehicle crashes, and further endangers the lives of the user and others. Research examining the role of polysubstance use on crash involvement, however, is sparse. Prior research has tended to lump all polysubstance users into a single category for purposes of determining driving-related outcomes (e.g., Hels et al., 2011; Lacey et al., 2009; Ramirez et al., 2016). Some recent research, however, has begun to delineate classes of multiple substance users (Scherer et al., 2015). The current study adds to the need for research examining the crash impact of various classes of polysubstance users by demonstrating patterns of clinically significant polysubstance use among drivers.

We found significant relationships between alcohol and marijuana using both BAC and self-report data. Specifically, marijuana use disorders were associated with drinking and driving, but primarily among low or moderate alcohol users (i.e., BAC below the legal limit) and not excessive users (i.e., BAC above the legal limit). Indeed, those who use alcohol excessively had no significant relationship with marijuana use disorders. This is consistent with previous research that has found the only factor that predicts cross-sectional BAC level among drivers is whether marijuana was used (Furr-Holden et al., 2011), which may indicate a preferred substance of use. That is, generally people tend to prefer using either marijuana or alcohol, but not both simultaneously. However, among those with substance use disorders, prior studies have found evidence of simultaneous use (Ahoronovich et al., 2005; Scherer et al., 2013). Each of the substances in the current study have been reported to impact driving-related skills and hence increase crash likelihood, and their combined use may further compound this concern. There is debate in the literature about whether substance use disorders increase the likelihood of crash involvement (Blomberg et al., 2009), with some authors suggesting it has no substantial impact (Furr-Holden et al., 2011). However, thus far, no studies have examined the crash risk associated with polysubstance use among those meeting clinical diagnostic criteria. The current study suggests that among those that meet criteria for substance use disorders, there is an increased likelihood of meeting diagnostic criteria for another substance. Future research examining the risks of substance use disorders on crash involvement, should consider the possibility of polysubstance use disorders and how that may interact with crash risk.

Drivers who had a BAC above the legal limit were about twice as likely as those with a negative BAC to meet use disorder criteria for cocaine. This is of concern as simultaneous use of cocaine and alcohol has been found to cause higher peak concentrations of cocaine compared to when cocaine is used alone (McCance et al., 1998) and mixing alcohol and cocaine has been found cause impulsive behavior and interfere with thinking and concentration (Harris et al., 2003). Although we were unable to explore why drivers with

BAC levels over the legal limit were more likely to report cocaine use disorders, prior research has also reported drivers with positive BAC to be three to four times more likely to use cocaine than drivers with a negative BAC (Voas et al., 2012). Potentially, cocaine use reduces the alcohol-induced impairments felt after alcohol consumption (Pennings, Leccese, & Wolff, 2002) or simultaneous cocaine and alcohol use heighten euphoria and perceived well-being (McCance et al., 1998) and judgments are altered causing users to feel more confident or conclude driving under the influence has lower risk.

Our findings also reveal that drivers who met diagnostic criteria for marijuana use disorder were over 42 times more likely than those who did not meet the same criteria to also meet use disorder criteria for cocaine. Conversely, drivers who met diagnostic criteria for cocaine use disorder were 27 times more likely to meet the same criteria for marijuana use. Although here we report on substance use disorders, research has found drivers who met clinical criteria for marijuana dependence to be 6.5 times more likely than those who did not meet criteria to use cocaine (Scherer, Voas, & Furr-Holden, 2013). Other research has also found cannabis use among youth (age 14 to 25) in Spain to predict cocaine use (Becoña et al., 2012). As marijuana use continues to gain popular support for legalization and becomes increasingly prevalent, the relationship between marijuana use disorders and cocaine use disorder requires scientific attention.

Lastly, drivers who met DUD criteria for pain killer use disorder were almost 30 times more likely than drivers who did not meet this criteria to also meet use disorder criteria for cocaine. While we are aware of previous research that has reported on the prevalence of alcohol use co-occurring with pain killer or cocaine use (Midanik, et al., 2007) as well as rates of cocaine or opioid dependence in an alcohol dependent sample (Dick et al., 2007), there is little research to-date on the proportion of simultaneous cocaine and pain killer use disorders. Given the national increase in concern around opiate use, the finding that these individuals have an increased likelihood of cocaine use disorders among drivers is somewhat alarming. National increases in opioid use necessitate that future research explore how the dual diagnosis of pain killer and cocaine dependence may impact potential crash involvement, as well as other adverse outcomes. The current research highlights the need to assess opioid dependent drivers as a risk for other substance use or use disorders.

Study limitations include the use of a cross-sectional design, which precludes causal interpretation. Furthermore, the current study would have been strengthened by inclusion of data on motor vehicular crashes, but such data were unavailable. In addition, we chose to utilize substance use disorder criteria in the current study to more closely resemble DSM-V diagnostic criteria as opposed to DSM-IV-TR criteria of substance abuse and dependence. However, some previous research has found differences between persons who meet abuse criteria and those who meet dependence criteria of any substance, and combining them into a single substance use disorder group may have negated some of these differences. Finally, as this research focuses on the top three most misused substances and on a sample of persons with access to a car and the ability to drive at nighttime, the generalizability of these findings is somewhat limited.

This study is the first attempt to observe rates of poly-substance use disorders in a sample of nighttime drivers, and highlights the need for future research to examine how polysubstance use and polysubstance use disorder prevalence may impact adverse driving outcomes (i.e., driving under the influence of alcohol/drug violations or crash involvement). It also underscores the need of research on crash involvement among drivers should examine polysubstance users in greater detail, rather than simply lumping all polysubstance users together for convenience.

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Table 1.

Demographic and substance use distribution of study subsample of 2007 NRS (*N*=4,277).

	N	%
Demographics		
Sex		
Male	2,712	63.4
Female	1,545	36.1
Race		
White	2,069	48.4
Black	742	17.3
Other	1,466	34.3
Education		
High school or less	1,176	27.5
College or greater	3,058	71.5
Age		
<21	601	14.0
21–34	2,024	47.3
35–44	741	17.3
45+	870	20.4
Substance Use		
Alcohol		
Use	3,584	83.8
Use Disorder	693	16.2 of total sample
		19.3 of alcohol users
Marijuana		
Use	1,380	32.3
Use Disorder	210	4.9 of total sample
		15.2 of marijuana users
Cocaine		
Use	925	21.6
Use Disorder	93	2.2 of total sample
		10.1 of cocaine users
Pain Killer		
Use	1,132	26.5
Use Disorder	206	4.8 of total sample
		18.2 of pain killer users

Table 2.

Substance use disorders as a predictor of other substance use disorders among subsample of 2007 NRS drivers. ($N = 4,277$)

	Alcohol Use Disorder		Marijuana Use Disorder		Cocaine Use Disorder		Pain Killer Use Disorder	
	AOR†	(95% CI)	AOR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
Alcohol Non-use disorder v. Alcohol Use Disorder	--	--	11.09***	4.98–24.73	1.71	0.64–4.56	0.53	0.22–1.28
Marijuana Non-use disorder v. Marijuana Use Disorder	11.16***	5.11–24.38	--	--	42.20***	13.61–130.92	0.54	0.17–1.75
Cocaine Non-use disorder v. Cocaine Use Disorder	1.35	0.50–3.66	26.96***	8.77–82.89	--	--	25.81***	9.88–67.40
Pain Killer Non-use disorder v. Pain Killer Use Disorder	0.51	0.22–1.20	1.02	0.32–3.27	29.85***	10.93–81.50	--	--
Sex (Male referent)	1.03	0.61–1.71	1.04	0.46–2.35	0.73	0.24–2.18	0.32**	0.15–0.68
Age (Under 34 years referent)	0.98*	0.96–0.99	0.92**	0.88–0.97	1.02	0.98–1.05	1.01	0.98–1.03
Race (White referent)	0.38*	0.21–0.70	3.35**	1.51–7.44	0.19**	0.06–0.58	3.43***	1.89–6.19

* = p<.05,

** = p<.01,

*** = p<.001

†Adjusted Odds Ratio – adjusted for sex, age and race

In this table, variables are weighted to reflect national populations.

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Table 3.

Blood Alcohol Content (BAC) as predictor of marijuana, cocaine or pain killer use disorder among subsample of 2007 NRS drivers. (*N* = 4,277).

	N	%	Marijuana Use Disorder		Cocaine Use Disorder		Pain Killer Use Disorder	
			AOR†	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
BAC = 0.0	3,578	*85.6*	*Referent*		*Referent*		*Referent*	
0.0 < BAC < 0.08	481	11.5	1.43***	1.25–1.64	1.06	0.89–1.26	1.11	0.96–1.28
BAC > 0.08	121	2.9	0.89	0.68–1.16	2.01***	1.52–2.66	0.24***	0.15–0.37

* = p<.05,

** = p<.01,

*** = p<.001

† Adjusted Odds Ratio – adjusted for sex, age and race