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Simultaneous Alcohol/Cannabis Use and Driving Under the Influence in the U.S.

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Abstract

Introduction: Alcohol and cannabis are commonly involved in motor vehicle crashes and fatalities. This study examines whether simultaneous use of alcohol/cannabis is associated with driving under the influence of alcohol and cannabis in the U.S.

Methods: Drivers aged 16 years with any past-year alcohol and cannabis use in the 2016–2019 National Survey on Drug Use and Health ($n=34,514$) reported any past-year driving under the influence of alcohol-only, cannabis-only, both alcohol/cannabis, or not driving under the influence. Survey-weighted associations between simultaneous alcohol/cannabis use and each of the driving under the influence outcomes were computed adjusting for sociodemographics and daily alcohol/cannabis use. Analyses were conducted from November 2020 to September 2021.

Results: In 2016-2019, 42% of drivers with past-year alcohol and cannabis use reported driving under the influence (8% alcohol-only, 20% cannabis-only, 14% alcohol/cannabis). Simultaneous alcohol/cannabis use was associated with 2.88-times higher adjusted odds of driving under the influence of cannabis-only (95% CI=2.59, 3.19) and 3.51-times higher adjusted odds of driving under the influence of both alcohol/cannabis (95% CI=3.05, 4.05), compared to not driving under the influence. Associations with driving under the influence of alcohol-only were unexpectedly in the opposite direction (adjusted conditional odds ratio=0.59, 95% CI=0.45, 0.79).

Conclusions: Overall, 2 in 5 drivers who used alcohol and cannabis reported driving under the influence of alcohol and/or cannabis. People reporting simultaneous alcohol/cannabis use were more likely to report cannabis-related driving under the influence. Prevention strategies should target individuals reporting simultaneous alcohol/cannabis use to reduce the occurrence of driving under the influence.

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Credit Author Statement

Gonçalves, Martins, Mauro conceptualized and designed this study. Gonçalves, Gutkind, and Castaldelli-Maia managed the literature searches and summaries of previous related work. Gonçalves and Segura undertook the statistical analysis, and all the authors, including Mauro, participated in the interpretation of the data. All authors contributed to critical revision of manuscript for important intellectual content and have approved the final manuscript.

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INTRODUCTION

Alcohol and cannabis are 2 of the most common substances involved in impaired driving and motor vehicle crashes in the U.S.¹⁻⁵ From September 2019 to March 2020, a total 22% of all seriously injured drivers tested positive for alcohol and 21% for cannabis.⁶ The effects of alcohol on driving have been well characterized,^{3,7,8} including a dose-dependent effect on driving performance, psychomotor, and cognitive impairments.⁹

Cumulative evidence shows associations between acute cannabis use and psychomotor and cognitive functioning impairment, which interferes with driving skills; cannabis dose, tolerance, and driver's experience also contribute to driving impairment.^{4,10-13} In simulated driving studies, driving under the influence (DUI) of acute cannabis use affected reaction time, lane tracking, and attention.¹⁴⁻¹⁶ Additionally, greater impairment is observed among individuals with higher levels of Δ^9 -tetrahydrocannabinol (THC),¹⁷ and with alcohol and cannabis co-use.^{15,16,18} Findings from simulation studies¹⁶ are consistent with literature indicating that acute cannabis use increases the odds of motor vehicle crashes.^{1,3,19,20}

Simultaneous alcohol/cannabis use may have an additive or synergistic effect on driving abilities, and it is associated more severe driving related outcomes than either substance alone.^{9,15,16} Compared with drivers without any substance use, simultaneous alcohol/cannabis use increased the risk of involvement in a fatal crash 25 times,² and alcohol/cannabis co-use increased the risk of causing a car crash 5 times.²¹ One study examining the rates of simultaneous alcohol/cannabis use among under-aged injured drivers in Arizona found that 32% of drivers who were tested for both substances had alcohol and cannabis positive tests.²² Another study found that high school seniors who reported simultaneous alcohol/cannabis use had higher rates of traffic violations and motor vehicle crashes than individuals who used either substance individually.²³ Also, simulation driving studies show that low amounts of either alcohol or cannabis can potentiate the effect of the other substance.^{15,16}

Concerningly, the number of drivers testing positive for alcohol and other drugs have increased,⁶ and the prevalence of simultaneous alcohol/cannabis use in the past year is about 5% of the general U.S. population.⁵ Similar sociodemographic characteristics are associated with simultaneous alcohol/cannabis use²⁴⁻²⁷ and with DUI²⁸⁻³⁰ such as younger age, male sex, and non-Hispanic White race. High income is also associated with DUI.²⁹ Collectively, research suggests that simultaneous alcohol/cannabis use increases driving impairment, and increases the risk of traffic fatality more than either substance individually, particularly among young adolescents.^{16,31} However, no nationally representative study has tested these relationships among adults.

The U.S. has consistent legislation on which levels of alcohol are considered illegal to drive and impaired driving (blood alcohol concentration of ≥ 0.08 g/dL, except for Utah, blood alcohol concentration of ≥ 0.05 g/dL)³² and standard measures for determining acute alcohol intoxication.^{10,22,27} However, the same is lacking for THC (the main active psychoactive constituent of cannabis) intoxication by itself, and with the interaction with other substances, as alcohol use.^{14,34} Additionally, the relationship between biological measures of THC

metabolites and cognitive and motor functions is complex, as THC metabolites remain in a person's system for days after acute intoxication.^{35–38} Considering the limitations in biological measures to determine impairment due to cannabis use, self-reported DUI could provide clinically relevant information.

Examining the effect of simultaneous alcohol/cannabis use on self-report DUI of alcohol-only, cannabis-only, and both substances using a nationally representative sample could contribute to better understanding the impact in U.S. adolescents and adults. This study uses the National Survey on Drug Use and Health (NSDUH) to investigate whether simultaneous alcohol/cannabis use is associated with higher odds of DUI of alcohol/cannabis (DUI-A/C) compared with simultaneous use. The hypothesis is that simultaneous alcohol/cannabis use is associated with higher odds of DUI-A/C compared with no simultaneous use in this national sample of U.S. adolescents and adults.

METHODS

Public files from the 2016–2019 NSDUH were used. NSDUH is a nationally representative sample of non-institutionalized civilians in the U.S. including individuals aged 12 years conducted by the Substance Abuse and Mental Health Services Administration. Data were collected via face-to-face household interviews using computer-assisted interviewing and audio computer-assisted survey instruments to increase the accuracy of responses to potentially sensitive questions. The overall interview response rates for screening and interviews during 2016–2019 ranged from 45.8% to 53.3% in individuals aged 12 years.^{5,35–37} Detailed methodological descriptions on NSDUH can be found elsewhere.³⁸

Study Sample

Across the 4 survey years, 225,622 observations were pooled, adding survey year indicators. Observations from participants aged 12–15 years ($n=36,150$) were excluded, because age 16 years is the most common minimum age for a driver's permit in the U.S.³⁹ Observations from respondents who reported not being a driver ($n=16,721$), without use of both alcohol and cannabis in the past year ($n=137,541$), or had missing data on simultaneous alcohol/cannabis use ($n=696$) were also excluded. The final study sample included 34,514 observations from drivers who were aged 16 years reporting past-year alcohol and cannabis use.

Measures

Two questions were used to create 4 mutually exclusive self-report DUI categories: (1) *During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?* and (2) *During the past 12 months, have you driven a vehicle while you were under the influence of marijuana?* Categories included reporting no DUI, DUI of alcohol-only (DUI-A), DUI of cannabis-only (DUI-C), and reporting both DUI of alcohol and DUI of cannabis (DUI-A/C).

A binary exposure variable of simultaneous alcohol/cannabis use indicated *using marijuana or hashish at the same time or within a couple hours of their last alcohol use*.

Covariates included 2 binary variables of substance use frequency: (1) daily alcohol use (> 300 days in the past year)⁴⁰ and (2) daily cannabis use (> 300 days in the past year).

Substance use binary variables (yes/no) included past-year tobacco use (i.e., any use of cigarettes, cigars, pipes, or smokeless tobacco), past-year drug use other than cannabis (i.e., any use of cocaine, hallucinogens, heroin, inhalants, methamphetamine, and misuse of pain reliever, sedatives, stimulants, and tranquilizers). Meeting DSM-5 proxy criteria indicated past-year alcohol use disorder (AUD) and cannabis use disorder (CUD) (AUD and CUD variables were created based on a proxy measure of the DSM-5 categories excluding craving and withdrawal, as done by Compton et al.⁴¹). Living in a medical cannabis law (MCL) state indicated the state of residence had a law approving cannabis for medical use before the date of interview. In 2016–2017, the question about MCL referred to the *interpretation of the date when a state's law took effect*, and in 2018–2019, it was based on *the date that a medical marijuana bill was signed into law or an initiative was approved by voters*.³⁸

Sociodemographic variables included age (16–20, 21–25, 26–34, 35–49, ≥ 50 years), sex (male, female), ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, or Other non-Hispanic [i.e., non-Hispanic Asian, Native American/Alaska Native, Native Hawaiian/Other Pacific Islander, or >1 race]) and family income (<\$20,000, \$20,000–\$39,999, \$40,000–\$74,999, ≥ \$75,000).

Statistical Analysis

First, a descriptive analysis of the overall sample was performed by the exposure variable (simultaneous alcohol/cannabis use versus no simultaneous use) using chi-square tests with Rao–Scott corrections for categorical variables of the survey-weighted sample characteristics. Second, a series of multinomial logistic regression models tested associations between sociodemographic and substance use variables with DUI outcomes. Bivariate models included each variable unadjusted for covariates, and then the multivariate models adjusted for sociodemographic variables (Appendix Table 1 provides details). Third, a weighted logistic regression was conducted to observe the association between simultaneous alcohol/cannabis use and any DUI (alcohol, cannabis, and other drugs) adjusting for sociodemographic variables (age, sex, race/ethnicity, family income). Fourth, a series of weighted multinomial logistic regression models were run to observe the association between self-report DUI outcome categories (using different reference categories: no DUI, DUI-A, DUI-C, compared with DUI-A/C) and simultaneous alcohol/cannabis use adjusting for sociodemographic variables (age, sex, race/ethnicity, family income). Then, a second series composed by weighted multinomial logistic regression models testing the association between self-report DUI categories and simultaneous alcohol/cannabis use adjusting for sociodemographic characteristics, alcohol, and cannabis daily use variables was run to obtain the separate conditional AORs and 95% CIs.

All statistical analyses were conducted using R software, version 4.1.0, packages survey and svrepmisc,^{42–44} adjusted for the NSDUH complex survey design. NSDUH sampling weights account for selection probability, non-response, and population distribution.³⁸ To account for 4 years of NSDUH data pooling, yearly survey weights were divided by 4 to make estimates nationally representative, and type I error was set at 5%.

RESULTS

Most participants were male (57.02%), non-Hispanic White (66.91%), with a family income \$40,000 (62.75%), and reported living in a state with an MCL (67.87%). Two thirds of participants reported any tobacco use in the past year and one third used any drug other than cannabis. In addition, 8.33% reported daily alcohol use, 19.62% daily cannabis use, and 21.46% met criteria for AUD and 17.73% for CUD. More than a quarter of the sample (27.53%) reported simultaneous alcohol/cannabis use.

Table 1 displays sociodemographic characteristics, substance use, and MCL according to simultaneous alcohol/cannabis use. Significant differences in all variables were observed while comparing individuals with and without simultaneous alcohol/cannabis use. Higher proportions of past-year tobacco use, drug use other than cannabis, daily alcohol use, daily cannabis use, AUD and CUD were observed in respondents with simultaneous alcohol/cannabis use.

Figure 1A shows the prevalence of self-reported DUI categories, and within each DUI category, the proportion of daily alcohol use (Figure 1B), daily cannabis use (Figure 1C), and simultaneous alcohol/cannabis use (Figure 1D). Most participants reported no DUI-A/C (57.63%), whereas 42.37% had any DUI. This included DUI-C (20.42%), DUI-A/C (14.06%) and DUI-A (7.89%).

Binomial logistic regression revealed that simultaneous alcohol/cannabis use was associated with 2.88 (95% CI=2.69, 3.09) times the odds of driving under the influence of alcohol or any other drug including cannabis (result not shown in tables). DUI-A/C (compared with no DUI) was associated with being younger, male, non-Hispanic White, reporting higher income, not living in a MCL state, and all substance use variables (any tobacco use, any drug use other than cannabis, daily alcohol use, daily cannabis use, and simultaneous alcohol/cannabis use). Appendix Table 1 provides more details.

Table 2 reports multinomial logistic regression models of self-report DUI categories by simultaneous alcohol/cannabis use adjusted for sociodemographic characteristics (age, sex, ethnicity, family income). Compared with no DUI, individuals with simultaneous alcohol/cannabis use were more likely to report DUI-A/C (AOR=4.39, 95% CI=3.92, 4.39) and DUI-C (AOR=4.28, 95% CI=3.89, 4.71), and less likely to report DUI-A. Compared with DUI-A only, reporting simultaneous alcohol/cannabis use was associated with 9.48 (95% CI=7.29, 12.33) times the odds of DUI-A/C. Compared with DUI-C only, simultaneous alcohol/cannabis use was not associated with DUI-A/C.

Table 3 reports estimates from multinomial logistic regression models of self-report DUI categories and simultaneous alcohol/cannabis use adjusted for sociodemographic characteristics (age, sex, ethnicity, family income), including daily alcohol use and daily cannabis use. Compared with the no DUI category, daily alcohol use was positively associated with DUI-A (AOR=2.35, 95% CI=1.80, 3.07), and daily cannabis use was positively associated with DUI-C (AOR=3.57, 95% CI=3.16, 4.04). Both daily alcohol (AOR=1.72, 95% CI=1.72, 2.20) and daily cannabis use (AOR=1.92, 95% CI=1.62, 2.27) were associated with DUI-A/C. Compared with no DUI, respondents reporting simultaneous

use had 3 times higher odds of reporting DUI-C (AOR=2.88, 95% CI=2.59, 3.19) and 3.51 times higher odds of DUI-A/C (95% CI=3.05, 4.05). Simultaneous alcohol/cannabis use was also associated with DUI-A/C when the reference category was changed to DUI-A (AOR=5.93, 95% CI=4.33, 8.11) and DUI-C (AOR=1.22, 95% CI=1.05, 1.42).

DISCUSSION

This study examined whether simultaneous alcohol/cannabis use was associated with self-report DUI outcomes in a nationally representative sample of drivers aged 16 years with past-year use of alcohol and cannabis. Forty-two percent of participants reported DUI of alcohol or cannabis (8% DUI-A, 20% DUI-C, and 14% DUI-A/C) in this sample. Simultaneous alcohol/cannabis use was associated with DUI-A/C (compared with no DUI, DUI-A, and DUI-C) and with DUI-C (compared with no DUI) after adjusting for sociodemographic characteristics and frequency of alcohol and cannabis use. Findings are in accordance with prior research showing that the association of simultaneous alcohol/cannabis use and DUI (when compared with concurrent use,²⁶ alcohol use only,²⁸ and fatal crashes²). This study adds to the literature reporting more recent nationally representative data from the U.S. (2016–2019) and compares different types of DUI categories.

Daily alcohol/cannabis use increased the likelihood of DUI-A and DUI-C, respectively, and both alcohol and cannabis daily use were associated with DUI-A/C. The association of daily cannabis use and DUI raises concern as the proportion of individuals aged 18–64 years reporting daily cannabis use increased (compared with 2007–2014 and 2002–2017).⁴¹ Despite a decrease in the proportion of people with CUD from 2002 to 2017,⁴¹ associations of daily use and DUI highlight the potential hazards from this pattern of consumption.

Of note, the use of biological measures to determine THC intoxication remains challenging, considering that the presence of cannabis metabolites is not sufficient to determine cognitive and motor impairment.^{34,45–47} Implications of cannabis testing are also inconsistent across states (non-zero versus zero-tolerance THC blood concentrations laws).⁴⁸ Future studies should investigate whether it is possible to establish a threshold of THC metabolites that indicate impaired driving skills, and also examine how THC dose, tolerance, and driving experience interact in combination with alcohol and cannabis acute use.

From a harm reduction perspective, identifying which population subgroups are at high risk for DUIs could assist the development of more focused prevention strategies considering risk patterns of substance intake. For example, a systematic review identified a consistent association of lower prices for alcohol sales (i.e., drink specials/happy hour) with higher levels of alcohol use, and also negative consequences such as DUI.⁴⁹ The authors also suggested the need for investigations on the association of drink regulations with reducing harmful alcohol use and related outcomes. Another issue that could potentially impact simultaneous alcohol/cannabis use is the density and proximity of cannabis and alcohol outlets.⁵⁰ Considering ongoing shifts in cannabis availability,⁵¹ future research should also investigate the potential impact of low or “promotional” cannabis prices with higher levels of use, intoxication, and simultaneous use of other substances.

Cannabis legislation is an important environmental factor that may influence cannabis availability as well as cannabis-involved DUI. As of June 2021, a total of 36 states and the District of Columbia had medical cannabis laws, and 18 states and the District of Columbia legalized recreational use.⁵² These shifts in cannabis policies may also impact the occurrence of DUI and alcohol/cannabis use. One study comparing the prevalence of DUI-C before and after MCL implementation reported that DUI-C doubled (1.02% to 1.92%) from 1991–1992 to 2012–2013.⁵³ The increase was higher in states that enacted an MCL compared with those that did not enact this law,⁵³ but no change was observed in DUI-A. Although a study looking at the number of traffic fatalities and recreational cannabis laws (RCLs) during the years of 2005–2017 revealed an increase in traffic fatalities after the implementation of RCLs in Colorado but not in Washington State.⁵⁰ Additionally, studies using nationally representative data reported increase in co-use and simultaneous alcohol/cannabis use related to MCLs/RCLs.^{54,55} Future studies should investigate more severe patterns of DUI, such as DUI-A/C, and observed the associations of simultaneous use as well as MCLs and RCLs within each state.

Limitations

Limitations are noted. First, DUI information was self-reported, which can be affected by recall bias and individuals' perception of whether they were under the influence of a substance. Self-perception of intoxication may not correspond with perceived driving skills, as individuals with observed motor impairment in cognitive tasks reported low subjective feeling of intoxication after 45 minutes of cannabis use.⁴⁵ However, considering the challenges on accessing cannabis recent use thorough biological measures, self-report is a feasible alternative to measure DUI behaviors. Second, DUI-A/C combined 2 DUI questions; as the NSDUH assessed these separately, it is not clear whether DUI-A/C reflected use of both alcohol and cannabis on the same occasion or 2 different episodes of DUI (e.g., 1 episode of DUI-A and a separate occasion of DUI-C). Future studies should investigate differences between simultaneous DUI-A and DUI-C (on the same occasion) versus separate episodes of DUI-A and DUI-C in the past year. Despite this limitation, the categorical outcome allowed comparisons across different DUI combinations. There is no information regarding the number of occasions that the DUI occurred, other data on driving experience (e.g., years of experience, frequency of driving), and drivers aged 15 years.

CONCLUSIONS

In this sample of drivers with past-year alcohol and cannabis use, 2 in 5 people reported DUI of alcohol-only, DUI of cannabis-only or both in the past year. Simultaneous alcohol/cannabis use was common in the DUI-C and DUI-A/C categories, with about half of the participants in each category reporting this pattern. Simultaneous use was associated with increased odds of these DUI outcomes. These findings have public health implications showing that people who report simultaneous alcohol/cannabis use are at high risk for DUI-C and DUI-A/C in the past years (2016–2019). Prevention strategies targeting specific behaviors, such as simultaneous alcohol/cannabis use, should be tested to reduce DUI burden.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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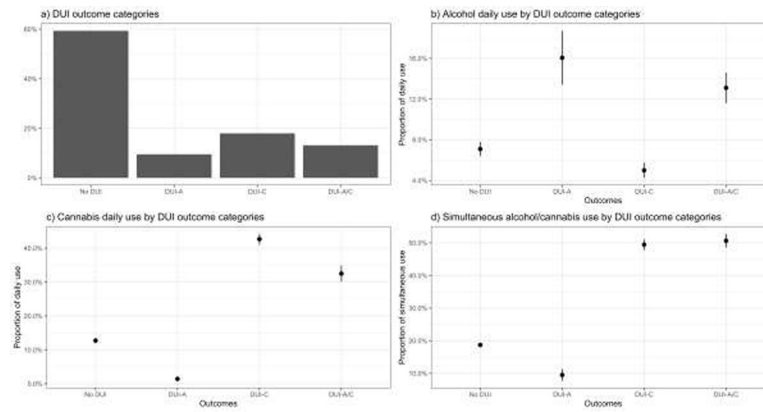


Figure 1.

Proportion of self-report driving under the influence of alcohol only, cannabis only and alcohol and cannabis, and alcohol and cannabis use patterns in each DUI outcome category.

Notes: The figure a refers to the proportion of DUI in each category. The figures b, c and d describe the proportions of daily alcohol use, daily cannabis use, and simultaneous alcohol/cannabis use, and the error bars in the lines refer to CIs.

DUI, driving under the influence; DUI-A, DUI of alcohol-only; DUI-C, DUI of cannabis-only; DUI-A/C, reporting both DUI of alcohol and DUI of cannabis.

Table 1.

Descriptive Sociodemographic Characteristics and Substance Use Patterns of Drivers by Simultaneous Use of Alcohol/Cannabis (N=34,514)

Characteristics	Overall proportion Col. Weight %	Yes, simultaneous alcohol/ cannabis use (27.53%) Col. Weight %	No, simultaneous alcohol/ cannabis use (72.47%) Col. Weight %
Age group, years			
16–20	13.86	12.30	14.29
21–25	18.66	20.22	17.96
26–34	25.18	27.42	24.37
35–49	22.03	22.97	21.85
50	20.27	17.10	21.53
Sex			
Male	57.02	63.52	54.44
Female	42.98	36.48	45.56
Ethnicity			
Non-Hispanic White	66.91	64.73	68.04
Non-Hispanic Black	12.65	15.77	11.35
Hispanic	6.82	13.29	13.63
Others	13.62	6.21	6.98
Family income			
<\$20,000	18.49	20.17	17.70
\$20,000–\$39,999	18.76	20.40	18.04
\$40,000–\$74,999	25.07	26.84	24.37
\$75,000	37.68	32.59	39.88
Substance use and MCL variables			
Any tobacco use, past year	59.74	68.82	56.13
Any drug use other than cannabis, past year	33.36	44.51	29.21
Daily alcohol use	8.33	11.25	7.24
Daily cannabis use	19.62	46.02	9.43
AUD DSM-5 proxy	21.46	26.81	19.39
CUD DSM-5 proxy	17.73	33.40	11.49
Living in MCL state	67.87	71.04	66.75

Note: Table describes sociodemographic characteristics, substance use variables and status of MCL residence weighted prevalence of drivers 16 years old who reported any use of alcohol and cannabis in the past year divided by simultaneous use of alcohol/cannabis (NSDUH 2016–2019). All comparisons showed p -value < 0.001.

AUD, alcohol use disorder; CUD, cannabis use disorder; MCL, medical cannabis laws; NSDUH, National Survey on Drug Use and Health.

Table 2.

Associations of Self-Report DUI and Simultaneous Alcohol/Cannabis Use Among Drivers (N=34,514)

Simultaneous alcohol/cannabis use	DUI alcohol-only X no DUI	DUI cannabis-only X no DUI	DUI A/C X no DUI	DUI A/C X DUI alcohol-only	DUI A/C X DUI cannabis-only
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Yes	0.46 (0.36, 0.59) **	4.28 (3.89, 4.71) **	4.39 (3.92, 4.39) **	9.48 (7.29, 12.33) **	1.03 (0.91, 1.16)
No	ref	ref	ref	ref	ref

Note: Boldface indicates statistical significance (* $p < 0.05$; ** $p < 0.01$). Tables reflects the results of multinomial logistic regression models of self-report driving under the influence categories by simultaneous alcohol/cannabis use adjusted for sociodemographic characteristics (age, sex, ethnicity, income) in drivers 16 years old who reported any use of alcohol and cannabis in the past year (NSDUH 2016–2019).

DUI, driving under the influence; DUI A/C, DUI alcohol and cannabis in the past 12 months; AOR, adjusted conditional odds ratio; NSDUH, National Survey on Drug Use and Health

Table 3.

Associations of Self-Report DUI, Daily Substance Use and Simultaneous Alcohol/Cannabis Use Among Drivers (N=34,514)

Variable	DUI alcohol-only X no DUI AOR (95% CI)	DUI cannabis-only X no DUI AOR (95% CI)	DUI A/C X no DUI AOR (95% CI)	DUI A/C X DUI alcohol-only AOR (95% CI)	DUI A/C X DUI cannabis-only AOR (95% CI)
Daily alcohol use, last year (300 days)					
Yes	2.35 (1.80, 3.07) **	0.60 (0.46, 0.77) **	1.72 (1.72, 2.20) **	0.73 (0.54, 0.99) *	2.90 (2.20, 3.82) **
No	ref	ref	ref>	ref	ref
Daily cannabis use, last year (300 days)					
Yes	0.12 (0.07, 0.21) **	3.57 (3.16, 4.04) **	1.92 (1.62, 2.27) **	16.09 (8.67, 29.84) **	0.54 (0.45, 0.64) **
No	ref	ref	ref	ref	ref
Simultaneous alcohol/ cannabis use					
Yes	0.59 (0.45, 0.79) **	2.88 (2.59, 3.19) **	3.51 (3.05, 4.05) **	5.93 (4.33, 8.11) **	1.22 (1.05, 1.42) *
No	ref	ref	ref	ref	ref

Note: Boldface indicates statistical significance (* $p<0.05$; ** $p<0.01$). Table reflects the results of multinomial logistic regression models of self-report driving under the influence categories by simultaneous alcohol/cannabis use, daily alcohol use and daily cannabis use adjusted for sociodemographic characteristics (age, sex, ethnicity, income) in drivers 16 years old who reported any use of alcohol and cannabis in the past year (NSDUH 2016–2019, N=34,514).

DUI A/C, DUI alcohol and cannabis in the past 12 months; AOR, adjusted conditional odds ratio; NSDUH, National Survey on Drug Use and Health.