

A Socioecological Perspective Regarding Risk Factors for Driving Under the Influence of Marijuana Among Young Adults

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ABSTRACT: Young adults are at high risk for using marijuana, driving under the influence (DUI) of marijuana, and fatalities or serious injuries from motor vehicle crashes related to DUI of marijuana. Within the context of increased legalization of marijuana use and shifting social norms, these public health concerns are particularly prominent. Drawing from a socioecological perspective, this commentary summarizes the literature indicating the importance of multilevel influences on DUI of marijuana among young adults. Indeed, prior research has indicated that risk for DUI of marijuana is associated with policy-level factors such as state and local policies related to marijuana, community-level factors including marijuana access (eg, legalized retail, black market), interpersonal influences including social norms, and intrapersonal factors such as risk perceptions of marijuana use and DUI. This literature should inform future research and practice aiming to develop, test, and implement multilevel interventions and develop messaging strategies aimed at curtailing DUI of marijuana.

KEYWORDS: Marijuana use, driving under the influence, young adults, psychosocial risk factors

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Marijuana is the most commonly used federally illicit drug in the United States.¹ Prevalence of marijuana use has increased dramatically, with 8.4% or 22.2 million US adults using marijuana in the past month, reflecting a 35% increase since 2002.^{2,3} Young adults (aged 18–24) represent a particularly high-risk group for marijuana use, with roughly 19.6% current (past-month) marijuana use prevalence.²

There is significant controversy regarding the effects of marijuana use, with a range of perspectives regarding its impact on both individuals and the general population. Evidence suggests that marijuana may have utility in managing a wide range of physical or medical problems (eg, chronic pain, nausea from chemotherapy, multiple sclerosis spasticity symptoms). However, the use of marijuana is also linked to some adverse health outcomes (eg, cardiovascular effects, respiratory/pulmonary effects), negative psychosocial outcomes (eg, development of schizophrenia or depression), and lower academic achievement.⁴

Of particular relevance to this commentary, marijuana use is associated with an increased risk for motor vehicle accidents and related fatalities and injuries.^{5–9} Over the past 10 years, the prevalence of drivers testing positive for marijuana has almost quadrupled.¹⁰ The risk for impaired driving under the influence (DUI) of marijuana may be particularly concerning among young adults, not only because they are at highest risk for marijuana use,² but also because young adults are disproportionately represented among those killed or seriously injured in traffic accidents.¹¹ Indeed, national estimates suggest

that 11.9% of 21 to 25 year olds reported DUI of marijuana in the past year.¹²

Moreover, one study documented that 44% of male and 9% of female first-year college students who had used marijuana in the past month reported driving after using marijuana, with much fewer reports of drinking and driving.¹³ These findings may indicate that alcohol is perceived as a greater impediment to driving or as resulting in greater risk for legal ramifications. Along the same lines, another study of 18- to 34-year-old current marijuana users found that 48% of the sample reported driving after marijuana use at least once in the past month; unfortunately, this concerning statistic was escalated by the fact that 74% of the sample reported being passengers in a car driven by someone who had been using marijuana.¹⁴ Interestingly, a smaller percentage—13%—reported driving after both marijuana and alcohol use.¹⁴ These data suggest that a large proportion of people who would drive after marijuana use would not (or did not) drive after also consuming alcohol. Perhaps, dual use heightens the perception of risk. Unfortunately, this study did not ask about driving only after alcohol use to compare the prevalence of DUI after marijuana only versus alcohol only to examine this question explicitly.

Taken together, these findings highlight the need to address DUI of marijuana, especially when comparing the rates of DUI of marijuana versus alcohol. This is particularly important during a critical period of marijuana use escalation and legalization alongside limited effective or evidence-based strategies to curb DUI of marijuana.^{15,16} This commentary serves as a call to



action to develop evidence-based interventions, particularly multilevel interventions of interventions at the macro levels, as such approaches have been shown to be highly effective in addressing DUI of alcohol.^{15,16}

Drawing from a socioecological perspective,¹⁷ we posit that several multilevel factors influence DUI of marijuana. These include policy-level factors such as state and local regulation of marijuana, community-level factors such as ways of accessing marijuana within one's community, interpersonal influences including social norms, and intrapersonal factors related to marijuana use such as perceived risk of addiction, harm to health, or negative psychosocial implications. Identifying risk factors for DUI of marijuana is critical in developing multilevel interventions and related conceptual frameworks to reduce this risky behavior, particularly among young adults.

At the policy level, since 2012, 8 states (Colorado, Washington, Oregon, Alaska, California, Nevada, Maine, and Massachusetts) and the District of Columbia have legalized recreational marijuana use for adults (≥ 21 years old), with the manufacturing and sale of marijuana and related paraphernalia also being legal in these states. In addition, 25 states have medical marijuana use and/or decriminalization laws.¹⁸ With most US adults favoring marijuana legalization,¹⁹ more states are likely to pass similar legislation. Unfortunately, recent studies have documented that increased marijuana use has coincided with increased state-level decriminalization and legalization of marijuana and that state-level marijuana legalization is associated with an elevation in DUI of marijuana and related motor vehicle accidents.^{20–23} However, the research regarding the link between legalization and marijuana use and DUI is not conclusive.²⁴

These policy changes have also shifted community-level factors, including changes in the availability of and accessibility to marijuana. With the legal marijuana market in the United States projected to be more than \$7 billion in 2016 and \$22 billion by 2020, it is among the fastest growing industries.²⁵ Because these numbers only represent marijuana sales in regulated states, these numbers underestimate the true marijuana "market" nationally. Individuals in states with medical or recreational marijuana legalization may now access marijuana through dispensaries or retailers, rather than just the black market available to those in states with no legalized marijuana.

These policy and retail environment changes have coincided with changes in interpersonal and intrapersonal factors regarding marijuana use and its effects. Regarding interpersonal influences, marijuana has shifted social norms. Indeed, research has documented that marijuana is perceived as more socially acceptable than the range of tobacco products, including more recent alternative tobacco products such as hookah and e-cigarettes.²⁶ One's social network also plays a significant role, with increased odds of marijuana use²⁶ and

DUI of marijuana¹⁴ being associated with greater use among peers.

Regarding intrapersonal factors, recent National Survey on Drug Use and Health (NSDUH) data indicate that risk perceptions of marijuana have decreased over time among both adolescents and adults.³ In addition, young adults perceive marijuana as less addictive and less harmful to one's health relative to various traditional and emerging tobacco products.²⁶ Central to this commentary, our research¹⁴ documented that, among young adult marijuana users, 62% reported feeling in control of their driving after marijuana use and 45% indicated little fear of facing legal ramifications resulting from marijuana-related DUI. Not surprisingly, these attitudes were correlated with DUI.

In summary, the literature indicates increasing prevalence of marijuana, particularly among young adults. Moreover, DUI of marijuana is increasingly prevalent, especially among young adult marijuana users. Continued legalization of both medical and recreational marijuana is likely to have implications for other multilevel influences and vice versa; thus, this is a critical public health issue that must be addressed through a socioecological lens.¹⁷

For future research directions, this rapidly evolving political and community context surrounding marijuana and the resulting shifts in social norms and individual beliefs about marijuana use and its effects highlight a need for comprehensive surveillance of use patterns, perceptions of marijuana, and DUI within the context of multilevel influences. Regarding practice and policy implications, findings regarding the detrimental effects of marijuana use on driving must be disseminated via educational campaigns targeting young adults, particularly those at the greatest risk for use (eg, males).^{15,16} Given that less concern about driving after marijuana use is associated with DUI of marijuana,¹⁴ explicit efforts to increase risk perceptions for legal ramifications, injury, and death related to DUI of marijuana may be critical components of intervention messaging.^{14,16,27} Such efforts must extend beyond education and involve policy-based interventions, such as publicized sobriety checkpoints, which have been shown to be effective in addressing DUI related to alcohol.¹⁵ However, more research is needed to inform policy and practice related to curtailing drug-impaired driving, as less evidence-based strategies have been identified.¹⁵ Indeed, future work must focus on developing, testing, and implementing multilevel interventions and develop messaging strategies aimed at curtailing DUI of marijuana.

Author Contributions

CJB conceptualized, wrote, finalized and approved this manuscript.

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