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## Driving While High

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## LETTER TO THE EDITOR

# Driving While High

Dear Editor,

As of May 2019, ten U.S. states and Washington DC have legalized non-medical/recreational use of cannabis. With increased access to legal marijuana across the country, some have raised concerns regarding unintended implications of these policies, such as the risk of motor vehicle crashes, which is the leading cause of mortality and injury among youth and young adults. Driving under the influence of marijuana is particularly concerning among young adults and college students, due to the increased level of substance use reported during the transition from high school to post-high school environments, such as college.

Initial research suggests that some may disregard the increased risk that alcohol and marijuana can have on one's ability to control a motor vehicle (Davis et al., 2016). In 2014, about one half of a sample from Colorado believed they could drive safely after using marijuana, while only 6% believed it would be safe to drive after drinking alcohol (Brooks-Russell, Wytinck, Wilfong, & Runyan, 2015). Despite the perceived low risk associated with driving while intoxicated (DWI) by marijuana, marijuana use, as well as combined alcohol/marijuana use, can increase the odds of receiving a speeding/driving ticket, having a motor vehicle crash and having a fatal motor vehicle crash (Chihuri, Li, & Chen, 2017). Moreover, marijuana use decreases both occasional and heavy users' driving performance, including: decreases driving speed, increases mean and variability in headways and decreases cognitive functions, such as reaction time, divided attention, expected response and lane position (Bosker et al., 2012).

Initial literature has begun to examine perceptions about and attitudes toward drugged driving (Malhotra, Starkey, & Charlton, 2017) and riding in the vehicle with someone who was intox-

icated (Li, Ochoa, Vaca, & Simons-Morton, 2018). Those who believe DWI by marijuana is unsafe are less likely to drive after using marijuana (Malhotra et al., 2017) and less likely to receive citations (Davis et al., 2016); however, there is little research that has examined marijuana-impaired driving beyond prevalence and incidence. In the present study, we employed a qualitative data collection technique to assess beliefs about marijuana-impaired driving without manipulating or condensing the direction of the participants' responses. We believed this data collection method was necessary to explore behaviors and beliefs about marijuana-impaired driving among a population of college students living in a state that did not permit the use of marijuana (medically or recreationally) at the time of the study. Using focus group sessions, we sought to explore college students' beliefs about marijuana-impaired driving and better understand reasons that college students may DWI by marijuana.

Participants were recruited as a part of a larger substance use study that assessed substance use beliefs and behaviors among undergraduate and graduate students at a large southern university. Data were collected between August and December 2015. Eligible participants were at least 18 years of age and enrolled at the university. A screening survey was distributed through an online daily campus newsletter to purposively recruit participants who reported the use of or exposure to marijuana; participants were not required to have ever used marijuana to be eligible for the current study. Following recruitment, all identifiable measures were deleted to protect participants. Due to the sensitivity of the data collected, no demographic or identifiable measures were collected from the focus group participants or linked between the screening survey and the focus group session.

Seven focus group sessions, lasting between 35 and 50 minutes, were conducted. Informed consent was obtained, with a signature, before the focus group sessions began, and participants were paid \$10 at the end of the session. This study was approved by the IRB at the University of Arkansas, protocol # 15-03-569. A structured script was used to assess participants' perceived acceptance of the behavior and rationale for engaging in the behavior. Participants were asked: "How often do you believe college students drive after using marijuana?" and "What are some reasons someone might drive after smoking marijuana?"

The principle investigators facilitated all focus group sessions and recorded detailed notes to report participants' discussions along with their verbal and non-verbal cues. Using the audio-recordings from the session, the first four focus group sessions were transcribed verbatim. Transcriptions were cross-checked using the audio-recordings and authors' notes. Personal identities of participants and any identifying measures (e.g., names or locations on campus) reported were removed from the transcripts to protect identities of all participants. Authors analyzed data separately, met to discuss identified axial-codes and created a codebook based on the first four transcripts. After the initial codebook was developed, three additional focus group sessions were held. Sessions were conducted until the researchers found a saturation of codes expressed by the participants. Saturation was determined by the inclusion of identified themes in multiple discussions and when no new themes were identified in additional focus group sessions; following analysis of the three additional focus group sessions, saturation was met. Coders discussed discrepancies between codes until final consensus was reached, and the codebook was updated as necessary. Finally, data analysis employed Braum and Clarke's (2006) thematic analysis approach, a process by which researchers determine 'themes' from the identified codes.

Thirty-two college students (17 males and 15 females) participated in the seven focus group sessions, ranging from two to six students per group. Many participants believed it was more acceptable to DWI by marijuana than by alcohol. While most were familiar with the risks of drinking and driving, fewer were aware of the dangers of marijuana-impaired driving. The participants' rationalization of the behavior provided four themes: risk compared to alcohol-impaired driving, low perceived risk, perceived improved driving ability and perceived dangers. Many believed DWI by marijuana was common, and it was safer than drunk driving.

*I think a lot of people don't think anything of it... it's so common and so accepted, it's something people do... they don't feel that intense altered change like you would if you were under the influence of alcohol. #13*

A few participants believed marijuana-impaired driving was unacceptable, and of those, some justified the behavior "in emer-

gencies.” One participant compared his/her beliefs about alcohol- and marijuana-impaired driving juxtaposition by stating:

*I abhor drinking and driving, can't stand it. Being high and driving, that's not really that big of an issue. #16*

Some participants compared the dosage of smoking marijuana to drinking.

*I know a lot of people who just take it like, 'Oh I smoked a bowl, so I'll be fine' but if they smoked a bunch they wouldn't drive. It's kind of like having two beers and driving versus 20. #29*

Others believed the effects caused by marijuana-impaired driving were not as detrimental as alcohol-impaired driving:

*It's a different experience if you're drunk than if you're high when you're trying to drive, so they probably think, it's safer to drive when you're high, but they know it's probably wrong to drive when you're drunk. #20*

Some believed marijuana to be a safer alternative to alcohol or other drugs. Defending their rationale for DWI by marijuana, many participants reported a low perception of risk associated with the behavior, both in terms of their driving, as well as that of their peers. Several participants claimed that driving after the use of marijuana was not likely to result in a car crash or a fatality, and some believed the only effects to driving performance caused by marijuana was decreased speed, which was not perceived to be harmful. While most were aware that marijuana could decrease driving speed, many did not believe this physiological response, or other unacknowledged effects, could cause a fatal motor vehicle crash.

Some participants also reported a perceived increase in their driving ability. These participants interpreted driving ability by their driving speed. Several mentioned driving less aggressively, decreasing road rage and helping them relax when DWI by marijuana.

*I drive better when I'm stoned just because I'm not racing through traffic, and I'm not angry. I always look down when I'm driving stoned, and I'm always right on the speed limit, and I feel like I'm going super-fast. #31*

Despite participants' belief that DWI by marijuana was common practice, some did not approve of the behavior. A few participants explained that they thought it was acceptable when they were younger (high school), but they believed that they had matured while at college, and now realized that it was something that people should not do. Others recognized that marijuana and alcohol "*both slow reaction time.*"

Perceived tolerance of the effects of smoking marijuana was discussed during several focus group sessions. Several participants believed driving performance improved with increased tolerance to marijuana. Some specifically raised caution to new marijuana users based on their own experiences or the experiences of their peers. One participant described their experience by stating, "*I ran over a center median whenever I drove [while impaired by marijuana]. That was the very first time I smoked, and I had to get home. And.... Uh, never again.*" #18

Several participants believed DWI by marijuana was safer than alcohol-impaired driving, without risk (safe), and in some cases, some believed DWI by marijuana improved their driving ability. This finding was consistent with previous studies from the UK and Australia that found people to believe DWI by marijuana improved their driving, caused them to be more cautious, gave them more control of the car, and decreased their road rage (Neale, 2001). Despite this perceived improvement in driving ability, self-reported performance may not be predictive of their actual driving ability. Until proven otherwise, public health advocates should consider marijuana-impaired driving to be dangerous and should caution users to not drive after use.

Our findings suggest some may believe heavy users are immune to the effects of DWI by marijuana. One participant referenced a finding by Bosker et al.'s (2012), that non-habitual marijuana users were significantly more likely to experience a decline in driving ability and habitual users' driving ability was not affected. However, the study found driving abilities among

all marijuana users, habitual and non-habitual, were significantly altered when under the influence of marijuana (Bosker et al., 2012). Those advocating for the recreational legalization of marijuana may magnify this misinterpretation, thus blurring the lines of harm reduction. With the increased decriminalizing of the medical and recreational use of marijuana in the US, it is important to accurately address areas for potential harm, such as DWI by marijuana.

Consistent with our findings, past studies have found participants to compare drugged driving to drunk driving. Similarly, these studies found that people were more acutely aware of the risks associated with alcohol-impaired driving than they were DWI by marijuana (Danton, Misselke, Bacon, & Done, 2003). Many of our participants endorsed the belief that DWI by alcohol was unacceptable, but DWI by marijuana could be justified by tolerance level and experience. In the past, researchers have suggested employing education and media campaigns, similar to those currently being used for drinking and driving, to help reduce marijuana-impaired driving (Neale, 2001). It is important to note that although these recommendations were made nearly 15 years before the data in our study were collected, our analysis reveals that peoples' beliefs about marijuana-impaired driving may not have changed much since the early 2000s. Simultaneously, access to marijuana has rapidly increased across the US and around the world. A concern that derived from the current analysis is the belief that DWI by marijuana improved drivers' performance. While studies have cited this finding internationally (Neale, 2001), it is unclear if this message is widely endorsed across the US. Our study is the first to report this belief among a sample of US college students. We believe communication strategies that endorse the message 'sober is the only safe way to drive' are needed.

Davis et al. (2016) recommended that health education specialists address adverse outcomes of DWI by marijuana rather than the legal ramifications related to driving impairment. Based on their findings, they suggest that media campaigns that display DWI fines may not be as effective as education about the physiological effects that marijuana can have on one's driving ability. Due to some participants in our study suggesting that decreased driving speed was the only consequence associated with marijuana use, we recommend health communication campaigns provide education that informs drivers about the physiological

impairments caused by marijuana use. Moreover, those developing behavior change interventions, such as educational programs or awareness campaigns are encouraged to use the most current theoretical frameworks to assess behavioral determinants (e.g., perceived consequences, perceived social and physical environment) and evaluate potential changes in these determinants, intention to perform behavior and actual behavior (Sharma & Mohata, 2018). Engaging college students in participatory dialogue may increase their awareness of potential consequences of DWI by marijuana. Such strategies may help them change their physical environment, such as using Uber or Lyft instead of driving under the influence of marijuana (Sharma & Mohata, 2018).

There are limitations to this study. Due to the methodological approach, findings should not be generalized to all college students. Such qualitative analysis was intended to expand our understanding of college students' beliefs about marijuana-impaired driving, but it was not our intention to make definitive conclusions about the sample's perceptions or behaviors. As mentioned earlier, the state from which this sample was drawn did not allow any form of legal (medical or recreational) use of marijuana at the time the data were collected; however, a state-wide medical marijuana policy was passed shortly after the focus group sessions were held. Such a political climate may have shaped the tone of conversations or may have been indicative of those who volunteered to participate. Moreover, recruitment techniques and sample size may have influenced our findings. With a larger or more diverse sample, other themes may have emerged.

As marijuana policies continue to emerge across the US, public health advocates will be faced with new challenges for prevention and safety. The perceived harm of marijuana-impaired driving should be routinely measured to determine educational needs for communities with increased access to marijuana. Health education and prevention specialists should use accurate and scientifically-proven information to educate their communities in addition to updated theoretical frameworks to create evidence-based strategies for behavior change. Rather than comparing relative harm of DWI by marijuana to drunk driving, public health messages should raise awareness about the physiological effects marijuana use can have on one's ability to control a motor vehicle.



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