College student marijuana involvement: Perceptions, use, and consequences across 11 college campuses

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HIGHLIGHTS

• We examined the prevalence of marijuana use and consequences across 11 universities.
• We observed marijuana use rates similar to representative samples of college students.
• We observed large differences in the number of consequences experienced.
• Marijuana users had more positive perceptions of marijuana compared to non-users.
• These data provide a useful baseline prior to increased legalization of marijuana use.

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ABSTRACT

Background: Marijuana is currently the most commonly used illicit drug in the United States, and with the movement toward legalization of recreational marijuana, the country faces numerous issues regarding policy, prevention, and treatment of marijuana use. The present study examines the prevalence of marijuana use and consequences and compares users and non-users on a wide range of other marijuana-related constructs among college students across 11 universities.

Method: Participants included 8141 college students recruited from the psychology department participant pools of 11 universities throughout the US, including four major regions of the US (West, South, Midwest, Northeast) and states with varying policies regarding the legality of marijuana use.

Results: We observed marijuana use rates similar to representative samples of young adults and college students (i.e., 53.3% lifetime marijuana users, 26.2% past month marijuana users). About 1 in 10 past month marijuana users experienced no consequences from their use, whereas nearly 1 in 10 experienced 19 or more consequences. Lifetime marijuana users had more positive perceptions of marijuana compared to non-users on a wide range of marijuana-related variables.

Conclusions: We report descriptive statistics on a wide range of marijuana-related variables. We hope that these data provide a useful baseline prior to increased legalization of recreational marijuana use. Multi-site studies like this one are needed to study the risky and protective factors for problematic marijuana use. These findings can inform interventions and public policy.

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1. Introduction

Considering major shifts in marijuana laws in the United States, Bob Dylan's (1964) lyrics are, indeed, true today: “The times, they are a changin’.” As of mid-2016, four states (Alaska, Colorado, Oregon, and Washington) and the District of Columbia have legalized possession and recreational use of marijuana. Medical marijuana has become legal in 23 states and the District of Columbia. At least eleven states have decriminalized possession of marijuana (i.e., they have reduced the penalties associated with possession) and it is plausible if not likely that these states will move toward legalization soon (Stebbins, Frohlich, & Sauter, 2015).

In the current climate of spreading legalization and decriminalization of marijuana use, there are countless issues facing the country regarding policy, prevention, and treatment of marijuana use. Although data from large epidemiological studies demonstrate that chronic

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marijuana use is associated with various psychosocial and medical problems, many questions still remain. For example, as more states make it legal to possess and use marijuana:

- How will recreational marijuana use in the general public be impacted?
- How will recreational marijuana use among adolescents and young adults be impacted?
- How will perceptions of healthy versus unhealthy use of marijuana be determined?
- What new standards might be necessary for the diagnosis of cannabis use disorder?
- What are the likely public health consequences of legalization?
- How will attitudes regarding marijuana change?
- How can regulation of legal marijuana markets minimize potential harm?

Hasin et al. (2015) analyzed data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) from years 2001–2002 and 2012–2013 to determine changes in the prevalence of cannabis use disorders (CUD) based on DSM-IV criteria, including marijuana abuse and dependence. They found that past-year prevalence of DSM-IV CUD in 2012–2013 was 2.9%, approximately double the prevalence of those with CUD in 2001–2002 (1.5%). They also found that approximately 30% to 36% of past-year users between 2001 and 2013 had a CUD. In a sample of first-year college students between the ages of 17 and 20 years old, Caldeira, Arria, O’Grady, Vincent, and Wish (2008) found that 9.4% of these students had CUD, or 24.6% of those who reported cannabis use in the past year. Students who had used cannabis five times or more over the past year had various cannabis-related problems. According to the National Survey of Substance Use and Health (NSDUH), the peak period of marijuana use occurs between the ages 18 and 25 years old (Center for Behavioral Health Statistics and Quality, 2015), which is also the age of most college students in the United States (U.S. Census Bureau, 2015). The long-term consequences of heavy marijuana use (especially in younger populations) may include addiction, altered brain development, poor educational outcome, increased likelihood of school dropout, cognitive impairment, lower IQ, diminished life satisfaction, and lower achievement (Volkow, Baler, Compton, & Weiss, 2014).

Altogether, these findings suggest that college students are an important group to study with regards to marijuana use. In the Monitoring the Future study (Johnston, O’Malley, Bachman, Schulenburg, & Miech, 2015), respondents in 2014 were asked to rate the risk associated with marijuana use. Only 8–10% of respondents between 19 and 30 years old rated experimental use as a “great risk,” while approximately 35% rated regular use to carry “great risk.” This latter response (35%) reflected a steep decline in the assessment of risk from the year 2006, when 55–58% of respondents perceived regular marijuana use to be a “great risk.” Johnston, O’Malley, Bachman, et al. (2015) and Johnston, O’Malley, Miech, Bachman, and Schulenburg. (2015) attribute this decline in the perception of marijuana risk to the legalization of recreational and medical marijuana. Furthermore they attribute peak levels of daily marijuana use to decreased perceptions of risk. While surveys like the MTF and NSDUH attempt to estimate marijuana-related attitudes of college students (e.g., MTF, NSDUH), these surveys are necessarily limited in their ability to assess a wide range of marijuana-related constructs.

In the present study, we examine a wide range of marijuana-related constructs that may be profoundly impacted by legalization/decriminalization of marijuana use, and/or hold promise as predictors of marijuana-related outcomes. For example, to capture the overall level and variability in personal beliefs, we assessed beliefs regarding marijuana-related policies and perceived impacts of marijuana. In terms of predictors, marijuana use motives (Simons, Correa, Carey, & Borsari, 1996), social norms (Neighbors, Geisler, & Lee, 2008; Napper, Kenney, Hummer, Fiorot, & LaBrie, 2016), identification with being a marijuana user (Neighbors, Foster, Walker, Kilmer, & Lee, 2013), and perceived availability of marijuana (Swaim, 2003) have been found to predict higher marijuana use and/or negative consequences. On the other hand, use of protective behavioral strategies (Pedersen, Hummer, Rinker, Traylor, & Neighbors, 2016) has been found to predict lower marijuana use/consequences. Taken together, assessment of these constructs can serve as an informative baseline for future research examining the antecedents, mechanisms, and sequelae of marijuana-related policy changes.

Given the unprecedented changes in the legal status of marijuana occurring in states across the United States (Stebbins et al., 2015), it is imperative that large scale studies be conducted to observe the impact of such policy changes. The present study reports descriptive statistics and basic findings from a large, multi-site study conducted by the Marijuana Outcomes Study Team (MOST) designed to examine many fundamental research questions. In the present study, we examined the prevalence of marijuana use among college students in the United States and characterized the different levels of marijuana-related consequences experienced by current (i.e., past month) marijuana users. Further, we examined a wide range of marijuana-related constructs that may cause or be influenced by marijuana-related policy changes including marijuana descriptive norms, marijuana injunctive norms, marijuana internalized norms, beliefs regarding marijuana users, marijuana user identification, perceived availability of marijuana, protective behavioral strategies for marijuana, marijuana motives, and beliefs regarding policies and impacts of marijuana. As a preliminary analysis, we examined the differences between lifetime marijuana users and non-users on these marijuana-related constructs.

2. Method

2.1. Participants and procedures

We recruited college students from the psychology department participant pools at 11 universities throughout the United States (see Supplemental Fig. 1). This protocol was approved by the institutional review boards at each participating university. At each site, a consent document was presented to the participants on which they provide consent by either clicking “Continue” or by answering affirmatively to a question of whether they would like to participate. Although we received 8894 total survey entries, 1.80% (n = 160) were identified as duplicate cases, 0.004% (n = 37) reported their age to be under 18 years old, and 6.83% of responders missed over one-third of the items (n = 556), leaving a sample of 8141 respondents. To ensure that data collection was standardized at each data collection site, all data were collected using the same software (i.e., PsychData), and all participants completed the same survey items in the same order and format across all sites. All data were collected between September 2015 and May 2016 by participants who were awarded research participation credit. Participating universities were deliberately chosen to represent the four major regions of the United States (West, South, Midwest, Northeast) as defined by the United States census, and to include states with varying policies regarding the legality of marijuana use, including two states with legal recreational marijuana use (Colorado and Washington), four states with legal medical marijuana use (New Mexico, New York, Wyoming, and California), and five states without legal provisions for marijuana use (Alabama, Virginia, North Dakota, Texas, Kansas).

The majority of the sample was White (64.7%), with 12.1% Black/African American, 15.5% Asian, 3.1% American Indian/Alaska Native, 1.3% Native Hawaiian/Pacific Islander, and 9.3% Other. About 18.0% of the sample reported being Hispanic, Latino, or of Spanish origin. Women were over–represented in our sample (66.9%), likely as a result of recruiting from psychology department participant pools. About 93.8% of the sample were between the ages of 18 and 25 years old (M = 20.40, Median = 19.00, SD = 4.19). About 6.7% of the sample reported