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Trends in and correlates of medical marijuana use among adults in the United States



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ABSTRACT

Background: Trends in and correlates of medical marijuana use are important to inform ongoing clinical, research, policy, and programmatic efforts. This study assessed trends in and correlates of medical marijuana use among U.S. adults.

Methods: We analyzed data from approximately 147,200 U.S. civilians aged 18 or older who participated in the 2013–2015 National Surveys on Drug Use and Health. Descriptive analyses, multivariable logistic regressions, and zero-truncated native binomial regressions were applied.

Results: Among U.S. adults, the prevalence of medical marijuana use increased from 1.2% in 2013 to 1.6% in 2015 ($p = 0.0007$). After adjusting for covariates, adults residing in medical marijuana states (states with legalized medical marijuana use) were 1.3 times more likely to use marijuana medically in 2015 than in 2013 (adjusted odds ratio (AOR) = 1.3, 95% confidence interval (CI) = 1.03–1.61), and adults in nonmedical marijuana states were 1.4 times more likely to report medical marijuana use in 2015 than in 2013 (AOR = 1.4, 95% CI = 1.05–1.90). Among adults who used marijuana exclusively for medical purposes in the past 12 months, trends in 12-month cannabis use disorders, daily or near daily use, and the number of days of marijuana use remained unchanged during 2013–2015. We identified how correlates of medical marijuana use among adults in medical marijuana states differed from their counterparts in nonmedical marijuana states.

Conclusions: Adults were more likely to use marijuana medically in 2015 than in 2013 in both medical and nonmedical marijuana states. Clinicians need to learn about and address evolving patterns of medical marijuana use in patients.

1. Introduction

Laws and policies related to marijuana use are shifting markedly in the U.S. By 2017, 29 states and the District of Columbia (DC) legalized medical marijuana use and several states and DC had legalized marijuana for nonmedical use (Hasin et al., 2015a, 2016b, 2017; Pacula and Sevigny, 2014; ProCon.org, 2017; Roy-Byrne et al., 2015). Most of the existing research has focused primarily on the impact of marijuana legalization on marijuana use prevalence among adults and youth in states that passed these laws compared to other states (Hasin et al., 2015a, 2015b, 2017; Martins et al., 2016; Pacula and Sevigny, 2014; Pacula et al., 2015; Silins et al., 2014; Wen et al., 2015; Wong and Clarke, 2015). Little is known about trends in medical marijuana use that is recommended by a doctor or other health care professional, especially trends in marijuana used exclusively for medical purposes (hereafter referred to as “medical-only”) among U.S. adults.

Marijuana use may help improve symptoms related to some medical

conditions and psychiatric disorders (D’Souza and Ranganathan, 2015; Hill, 2015; Whiting et al., 2015); however, heavy marijuana use is associated with adverse health consequences (e.g., cancer, chronic obstructive pulmonary disease, and heart disease), unemployment, lower income, diminished life satisfaction, and criminal behavior (Schauer et al., 2016; Volkow et al., 2014).

Using state registration data to track trends in registered medical marijuana participation, an earlier study found significant variations by state and within states over time (Fairman, 2016). A recent study found that 17% of marijuana users residing in medical marijuana states reported use for medical purposes (Lin et al., 2016). Recognizing that a physician might recommend medical marijuana use to a patient regardless of their residing state (Chaudhry et al., 2016; ProCon.org, 2017), another recent study reported that 21.2% of medical marijuana users resided in states that had not legalized such use (Compton et al., 2017).

As medical marijuana laws and practices evolve (Fairman, 2016;

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Pacula and Sevigny, 2014; Pacula et al., 2015), it is likely that there will be changes in the prevalence and correlates of medical marijuana use recommended by a doctor or other health care professional among adults in the U.S., in states with legalization of medical marijuana use (hereafter referred to as “medical marijuana states”), and in states without legalization of medical marijuana use (hereafter referred to as “nonmedical marijuana states”). Examining these trends and correlates over 3 years is the main purpose of this study. In addition, because individuals are not always aware of their state’s laws, we assessed whether and how self-reported marijuana use recommended by a doctor or other health care professional varied by the actual and the perceived medical marijuana legalization in their residing state. Our results may help inform ongoing marijuana policy discussions, help clinicians provide optimal care for patients using marijuana, and inform future research, public health messages, and programmatic efforts. We addressed the following questions:

1. What are the prevalence of any medical marijuana use and of medical-only marijuana use among adults in each U.S. state? Have there been changes in the prevalence of any medical marijuana use and of medical-only marijuana use among all adults and among adult marijuana users in the U.S.?
2. What are the correlates of any medical marijuana use and medical-only marijuana use among U.S. adults? Is perceived medical marijuana legalization in the residing state associated with any medical marijuana use and medical-only marijuana use? Do the correlates of any medical marijuana use and medical-only marijuana use differ by legalization status of medical marijuana use in the residing state?
3. What are the prevalence and correlates of cannabis use disorders and of marijuana use frequency in the past 12 months among adults who used marijuana only for medical purposes (“medical-only marijuana users”) in the U.S.? Do they differ by legalization status of medical marijuana use in their residing state?

2. Methods

2.1. Study population

We examined data from adults aged 18 or older who participated in the 2013–2015 National Surveys on Drug Use and Health (NSDUH), a face-to-face yearly survey conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA). NSDUH provides national and state representative data on marijuana and other substance use and use disorders among the U.S. civilian, non-institutionalized population aged 12 or older (SAMHSA, 2017).

NSDUH employed a state-based design with an independent, multistage area probability sample within each state and the District of Columbia. Data were collected by interviewers during personal visits to households and non-institutional group quarters. The interview averaged about an hour. Audio computer-assisted self-administered interviewing (ACASI) was used, providing respondents with a private, confidential way to record answers. The annual mean weighted response rate for the 2013–2015 NSDUH was 57.9% (2013 NSDUH: 60.2%; 2014 NSDUH: 58.3%; 2015 NSDUH: 55.2%) (SAMHSA, 2017). Details regarding NSDUH methods are provided elsewhere (SAMHSA, 2017).

2.2. Measures

2.2.1. Outcome measures

NSDUH collected whether a respondent resided in a state in which medical marijuana use was legal at the time of the survey interview, a time-dependent variable determined by (1) the respondent’s date of interview, (2) the respondent’s current state of residence, and (3) an external source (ProCon.org, 2017) containing the most recent list of states with medical marijuana laws along the exact date (mm/dd/yyyy) the law went into effect. If the respondent had moved from one

residence to another within the 12 months prior to the survey interview, NSDUH collected the state in which the respondent lived 12 months previously.

Beginning in 2013, NSDUH respondents who reported using marijuana in the past 12 months (12-month marijuana users) were asked if any marijuana use in the past 12 months was recommended by a doctor or other health care professional and if “yes”, whether all marijuana use in the past 12 months was recommended by a doctor or other health care professional. If users reported that any marijuana use was recommended by a doctor or other health care professional, they were coded as “any medical marijuana use”. If users reported that all marijuana use was recommended by a doctor or other health care professional, they were coded as “medical-only marijuana use”. NSDUH asked 12-month marijuana users to state the number of days they used marijuana. “Daily or near daily users” were those reporting on average using 5 days + per week, 20 days + per month, or 240 days + in the past 12 months. In addition, NSDUH respondents were queried on whether they thought that medical marijuana use was legal in their residing state (SAMHSA, 2017).

2.2.2. Measures of correlates

Our rationale for examining potential correlates was based on the clinical purposes for this study as well as the existing literature on medical and medical-only marijuana use. To help provide optimal care for patients using marijuana, it is important for clinicians to understand the sociodemographic characteristics (age, sex, race/ethnicity, education, employment status, family income, health insurance, marital status, metropolitan statistical area (MSA), region), health status (self-rated health, the number of past-year emergency room (ER) visits), behavioral health status (major depressive episode (MDE), suicidal ideation, nicotine dependence, alcohol use disorders, cannabis use disorders, cocaine use, heroin use), and specific medical marijuana use factors (residing in a medical marijuana state and perceived medical marijuana legalization in residing state) of their patients who use marijuana medically. Understanding these correlates can help clinicians identify patients at risks for behavioral health problems and develop appropriate treatment plans and intervention strategies. Knowledge of related characteristics can help inform marijuana policy discussions, public health messages, and future research.

In particular, a recent study (Compton et al., 2017) reported that the following marijuana users were less likely to have medical-only marijuana use: users aged 18–29; users residing in non-West regions; users who reported non-fair/poor self-rated health; and users with heavy alcohol use. In contrast, the following marijuana users tended to have medical-only marijuana use: users disabled for work; those without health insurance or with Medicaid; users residing in large MSA; users residing in a state with legalization of medical marijuana use; and users perceiving state legalization of medical marijuana use (Compton et al., 2017). Those who reported medical marijuana use also had more medical problems and psychiatric disorders (Roy-Byrne et al., 2015; D’Souza and Ranganathan, 2015; Hill, 2015; Whiting et al., 2015).

The 2013–2015 NSDUH assessed use of alcohol, tobacco, marijuana, cocaine, and heroin in the past 12 months from all respondents. NSDUH assessed MDE, cannabis use disorders, and alcohol use disorders in the past 12 months based on assessments of individual diagnostic criteria from the DSM-IV (American Psychiatry Association, 1994). Nicotine dependence among cigarette smokers was assessed using the Nicotine Dependence Syndrome Scale (Shiffman et al., 2004). These measures have good validity and reliability (Gruza et al., 2007; Jordan et al., 2008; SAMHSA, 2010). The 2013–2015 NSDUH asked all adult respondents about suicidal ideation: “At any time during the past 12 months, did you seriously think about trying to kill yourself?”

2.3. Statistical analysis

First, we estimated the annual average prevalence of any medical

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