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Comparing adults who use cannabis medically with those who use recreationally: Results from a national sample

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Abstract

Objectives—Cannabis has been legalized for medical use in almost half of the states in the U.S. Although laws in these states make the distinction between medical and recreational use of cannabis, the prevalence of people using medical cannabis and how distinct this group is from individuals using cannabis recreationally is unknown at a national level.

Methods—Data came from the 2013 National Survey on Drug Use and Health (NSDUH). All adults endorsing past year cannabis use who reported living in a state that had legalized medical cannabis were divided into recreational cannabis use only and medical cannabis use. Demographic and clinical characteristics were compared across these two groups.

Results—17% of adults who used cannabis in the past year used cannabis medically. There were no significant differences between those who used medically versus recreationally in race, education, past year depression and prevalence of cannabis use disorders. In adjusted analyses, those with medical cannabis use were more likely to have poorer health and lower levels of alcohol use disorders and non-cannabis drug use. A third of those who reported medical cannabis use endorsed daily cannabis use compared to 11% in those who reported recreational use exclusively.

Conclusions—Adults who use medical and recreational cannabis shared some characteristics, but those who used medical cannabis had higher prevalence of poor health and daily cannabis use.

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As more states legalize cannabis for medical use, it is important to better understand similarities and differences between people who use cannabis medically and recreationally.

1. Introduction

Cannabis is the most commonly used schedule I drug in the United States, and the prevalence of past-month cannabis use among those ages 12 years and older has risen steadily in the last decade (1). This rise in use has coincided with an increase in the number of states allowing cannabis to be legally recommended for qualifying medical conditions. Simultaneously, there has been a decrease in perceived risk of cannabis use by the general population (2). Currently, twenty-four states and the District of Columbia have legalized cannabis for medical use. Although specific conditions covered vary from state to state, most states that have legalized use of medical cannabis require that a physician submits a signed form to the state and the state provides a card as verification that the patient qualifies to use medical cannabis. Legalization may be associated with effects such as decriminalization, but could also lead to a range of unintended consequences (3). To better understand the potential for broad consequences, it is important to understand the prevalence of recreational and medical cannabis use and the similarities and differences between people who use for medical reasons and those who use for recreational purposes.

Although there is now a distinction between medical and recreational use, little is known about those who use medical cannabis. Prior studies have found a number of risk factors and correlates for cannabis use in general, including male gender, psychiatric conditions (4-5) and other substance use (6). Nonetheless, there has only been limited research examining differences between those who use cannabis for medical versus recreational purposes. One recent study of patients seeking treatment at an urban safety-net medical center (7), found that individuals with medical cannabis cards were more likely to screen as moderate risk for cannabis use, rather than low or high risk, and had lower use of other substances than cannabis users without medical cannabis cards. A secondary data analysis of a clinical trial that recruited adult primary care patients in Washington state who endorsed drug use asked participants using cannabis whether their use was “medical” (8). Those who reported “medical” use of cannabis had more medical problems, more days of cannabis use, and less use of other substances compared to people who used cannabis recreationally (8). Although these studies provide important preliminary information regarding potential differences of medical cannabis users, further studies examining clinical and demographic characteristics from nationally representative samples are needed to understand the issue in the broader U.S. population.

As an important step to better understand similarities and differences between adults who use cannabis medically versus those who use for purely recreational purposes, we examine demographic and clinical correlates of these two groups. Data are from a nationally representative survey of non-institutionalized individuals living in the U.S., and we focus on adults ages 18 years and older who report past-year cannabis use and live in states with legalized medical cannabis.

2. Methods

2.1 Participants and procedures

Data come from the National Survey on Drug Use and Health (NSDUH), a nationally-representative cross-sectional survey in the U.S. that assesses drug use and related health concerns. The NSDUH uses a multistage area probability sampling design covering all 50 states, surveying non-institutionalized individuals ages 12 years and older. The present study used data from the 2013 survey, which was the first year that assessed the medical use of cannabis. For these analyses, we included adults ages 18 years and older with past year cannabis use ($n = 7,835$) who reported living in a state at the time of the interview that had legally approved the use of medical cannabis ($n = 3,200$).

Interviewers administered study questions using computer-assisted personal interviewing and audio computer-assisted self-interviewing, which provides participants with privacy to answer potentially sensitive questions such as those related to substance use. Participants were compensated with \$30. Further information regarding survey methods have been reported elsewhere (1). The RTI Institutional Review Board (IRB) approved the data collection procedures, and this secondary data analysis was considered exempt by the University of Michigan IRB.

2.2 Measures

Participants reported whether or not they had ever used cannabis in their lifetime, how long it had been since their last cannabis use, and the number of days of cannabis use in the last year. Participants who reported using cannabis within the last 12 months were included in these analyses. Participants were asked “Earlier, you reported using marijuana in the past year. Was any of your marijuana use in the past 12 months recommended by a doctor?” Participants were then divided by whether or not they answered yes or no to this question, which was added to the 2013 NSDUH survey to assess for use of medical cannabis. For the present study, those who answered yes to this question were considered to have “medical cannabis use”. Individuals categorized as those who used cannabis recreationally, used only recreationally (no medical use); those who had any medical use (but may have also used recreationally) were categorized into the medical cannabis use group.

Demographic characteristics included sex, race-ethnicity (non-Hispanic White as reference versus other races/ethnicities), age (18-25, 26-34, 35-49, 50 or older), education (less than high school, high school graduate, some college and college graduate), and employment (full time or part time, unemployed, and other including those not in the labor force). Categorization of variables reflected NSDUH-suggested categories to allow for comparison with other publications using NSDUH data.

Past-year alcohol abuse or dependence was defined according to questions that assessed use based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria (9). DSM-IV criteria were also used to define past year cannabis abuse or dependence, which was separately examined from all other drug abuse and dependence (excluding cannabis use) (9). Binge drinking was defined by drinking five or more drinks on one occasion. Daily cannabis use was defined as 360 days of cannabis use in the last year.

A binary variable was created to indicate any past year use of heroin, cocaine, inhalants, tranquilizers, or hallucinogens and misuse of prescription pain medications, sedatives, or stimulants. Of note, cannabis use was excluded from this category. Past year nicotine dependence was assessed using the Fagerstrom Test of Nicotine Dependence; participants met criteria for nicotine dependence if they endorsed smoking in the past month and smoking less than 30 minutes after awakening (10, 11).

Past year depression was assessed using DSM-IV criteria (9). Participants who met criteria for major depressive episode endorsed experiencing five or more of the nine DSM-IV major depressive episode symptoms in the same two week period, with at least one of these symptoms being either anhedonia (loss of interest or pleasure in activities) or depressed mood (12). Overall health was assessed using an item from the CDC's Health-Related Quality of Life Scale asking about "overall health" and response options included excellent, very good, good, fair, and poor. Worse ratings on this single item have been significantly associated with functional decline and mortality (13, 14). Psychological distress was assessed using the Kessler-6, a questionnaire that provides a dichotomous measure of psychological distress with scores 13 or higher indicating significant distress (15). Questions asked about frequency and level of feeling distressed, and past year psychological distress was a recoded variable based on data from the past month and the worst month in the past year. Overall functioning was assessed using the World Health Organization Disability Assessment Schedule (WHODAS), an abbreviated scale asking participants how much difficulty they experienced in doing eight daily activities in the past year. Participants were assigned values of 1 for "mild," 2 for "moderate," and 3 for each activity that they had "severe" difficulty performing. The assigned values were summed for a total score that could range from 0 to 24 with higher scores indicating greater disability (12).

2.3 Data Analyses

All analyses were weighted to account for the complex survey design and to ensure that findings are representative of the general non-institutionalized U.S. population. NSDUH-defined variables were utilized for stratification, clustering and weighting. To assure correct variance estimation, the entire sample was divided into subpopulations along the lines of cannabis past year use/no use, and residence in states with/without legalized medical cannabis. With the study sample subdivided, the analysis focused on the domain of people with past year cannabis use living in states where medical cannabis was legal. Bivariate comparisons of demographic and clinical characteristics were assessed across those with medical and recreational cannabis use utilizing log likelihood chi-square tests for categorical variables and ordinary t-test for continuous variables. Consistent with previous literature (16, 17), results consist of unweighted sample sizes and weighted percentages to provide accurate information on both the number of subjects who were sampled and the nationally representative percentages. Multivariable logistic regression, with Taylor series linearization, was used to examine the association of demographic and clinical characteristics in people who used medical cannabis compared to those who used recreationally only. This approach uses Taylor series linearization to adjust standard errors of estimates for complex survey design, including clustered data in the NSDUH. Demographic variables evaluated in the bivariate comparisons and relevant clinical characteristics that were significantly different

across groups were included as independent variables in the regression models. All data analysis was performed using SAS v 13.1 (18).

3. Results

Among all individuals who lived in states with medical cannabis legislation, 17% used for medical reasons and 83% used recreationally. Table 1 displays the demographic and clinical characteristics of the two groups of adults who used cannabis. Race/ethnicity, education level and prevalence of past year major depressive episode were not significantly different between the two groups. Distributions across age groups ($p < 0.001$), levels of employment ($p < 0.001$) and health status ($p < 0.001$) were significantly different between those with medical use versus recreational cannabis use. People with medical cannabis use had three times the prevalence of daily or almost daily cannabis use (33%) compared with people who used recreationally (11%). Ten percent of individuals who used recreationally and 11% of those who used medically met criteria for cannabis abuse/dependence. On average, individuals with medical cannabis use also had greater disability when performing activities ($p = 0.002$), and a greater percentage had psychological distress ($p = 0.02$).

Table 2 displays the results of the multivariate logistic regression comparing those with medical cannabis versus recreational use. Variables in the model included demographic variables and relevant clinical characteristics that were significantly different across groups in the bivariate comparisons. People who used medical cannabis were more likely to report only “good” (AOR 1.83, 95% CI 1.12-2.99) or “fair/poor” (AOR 2.75, 95% CI 1.41-5.33) health instead of excellent health compared to recreational users. Individuals who used medical cannabis were less likely to meet criteria for past year alcohol abuse or dependence (AOR 0.52, 95% CI 0.34-0.81) and less likely to have used illicit drugs in the past year (AOR 0.52, 95% CI 0.33-0.83). However, they were much more likely to use cannabis on a daily basis (AOR 4.29, 95% CI 2.82-6.55).

4. Discussion

This is the first study, of which we are aware, that compares clinical and demographic characteristics in adults who use medical cannabis with those who report exclusive recreational use in a nationally representative sample. In this study of individuals who reported cannabis use in the past year, about a sixth of those who reside in states that legalized medical cannabis used cannabis recommended by a medical provider. Although, people who use medical cannabis currently comprise a minority of cannabis users, the number of people using medical cannabis may grow as more time elapses from passage of medical cannabis laws, and as more states legalize medical cannabis (19). Some studies in adults suggest a rise in the number of adults with cannabis use disorders (20), especially in states that have legalized medical cannabis due to the higher prevalence of use in those states (21). Additional work should examine whether such changes are directly related to the rise in the number of people who use medical cannabis.

Overall, individuals who used cannabis medically shared some similarities with those who used recreationally, but also a number of important differences. Both groups were similar in

terms of race and education and had similar prevalence of depression. People who used medical cannabis, however, were more likely to use cannabis daily or almost daily. Prior studies, which did not distinguish medical from recreational cannabis use, have shown that daily cannabis use is associated with other risk behaviors and negative consequences (22, 23); although daily use may not be associated with higher medical utilization in the form of emergency room visits or medical hospitalization (24). Future studies focused on daily cannabis use may further clarify the array of impacts. In addition, people who used medical cannabis in this national sample were more likely to have worse overall health, which has also been found in another study (8). This finding is not entirely unexpected given that individuals with medical cannabis use must have a qualifying medical condition in order for a provider to recommend the use of cannabis. However, it remains important to consider that people who use medical cannabis may have poorer overall health, and to consider that people with health issues may believe that cannabis is helpful for conditions that may not be specifically indicated (25).

Furthermore, individuals who used medical cannabis were less likely to meet criteria for an alcohol use disorder or to use other illicit drugs, which suggests that recreational cannabis users may more likely be polysubstance users. There are likely differences in motives for use and that medical cannabis users may tend to use with the goal of alleviating medical symptoms in addition to alleviating anxiety and other motives (25) and recreational users may be a more heterogeneous group who are more likely to use for many other reasons including experimentation and social reasons (26). Future studies should examine whether there are different motives for cannabis and other substance use among medical and recreational cannabis users that may account for differences in prevalence of other substance use.

In recent years, there has been a decrease in perceived risk of cannabis use by the general population (2) and people may be more likely to perceive lower risk with medical use because it has been recommended by a medical provider. Although cannabis can be recommended by a physician in some states, the process is quite different from the majority of treatments physicians typically prescribe (27). Ultimately, more studies are needed to more comprehensively evaluate the impact of medical cannabis use, especially on outcomes such as health and functioning. In addition, this study indicates a similar prevalence of cannabis use disorders in people who use recreationally or medically, which is consistent with a prior study that indicated people who use medical cannabis have similar prevalence of problematic use as others who use cannabis (25). Taken together, this suggests that treatment providers may want to assess for risky use of cannabis as well as other indicators of poor functioning (e.g., depression) in all cannabis users, regardless of whether their use is recreational or medical.

The present study has several potential limitations. Medical cannabis use was evaluated using a single question in the NSDUH that asked about cannabis use “recommended by a doctor” and may not necessarily only reflect those who possessed a medical cannabis card and obtained cannabis through a medical dispensary. However, all states that have legalized medical cannabis require a licensed treatment provider to certify legal use; thus, this indicator likely reflects the majority of people who have sought a medical indication for use

of cannabis. Also, the prevalence of medical cannabis use was similar to the percent of cannabis users who reported having a medical cannabis card in a sample of patients seeking health care in Colorado (7). Overall, there are potential drawbacks of this manner of assessing medical cannabis use and results from this national sample need further replication. However, examining patients who report having a medical cannabis card can also be problematic as this approach would still miss those patients who do not have cards but elect to use cannabis to alleviate medical conditions. Our findings that suggest differences between patients who use cannabis as recommended by a physician and those who use recreationally provide an important step in beginning to understand such issues in a nationally representative sample. In addition, this analysis was limited to people who reported living in states that have legalized medical cannabis; consequently, results may not generalize to all states. Furthermore, the impact of variations in state regulation was not examined, which may be associated with variations across states in patterns of medical and recreational cannabis use. As is consistent with other large scale epidemiological surveys, data are based on self-report and participants may have under-reported risk behaviors such as substance use. However, NSDUH uses computer assisted self-administered interviewing methods that have been shown in prior studies to help in minimizing under-reporting (28). In addition, the NSDUH sample excludes incarcerated, institutionalized and homeless adults, which may limit generalizability. Finally, this analysis was cross-sectional so we cannot infer causality, particularly between demographic and clinical characteristics and type of cannabis use.

5. Conclusions

The present study addresses a gap in the literature by providing a better understanding of correlates of medical and recreational cannabis use in a nationally representative sample of U.S. adults. In this study, people who used cannabis medically and recreationally were distinguished from each other in a number of important ways. Specifically, patients who reported medical cannabis use had poorer health and greater daily cannabis use, although the cross-sectional nature of this study cannot determine causal links between these characteristics. Nonetheless, it may be important for providers to ask specifically if cannabis is for medical or recreational reasons and to know that potential differences exist between these groups of patients so that interventions may be more appropriately tailored. In addition, when patients present in clinical settings and endorse cannabis use recommended by a medical provider, it may be as important to screen for risky use in this group as in those who report purely recreational use given similar prevalence of cannabis use disorders. Future studies should examine differences in outcomes by following patients longitudinally, to further understand the potential similarities and differences between those who report using cannabis for medical reasons and those who report recreational use.

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Highlights

- 17% of adults who used cannabis in the past year used cannabis medically
- Compared adults who use medical cannabis with those who use recreationally
- Medical cannabis users had worse health and more daily use (vs. recreational users)
- Important to assess for risky use in both groups

Table 1

Demographic and clinical characteristics in people who use cannabis for medical and recreational reasons.

		Medical cannabis use (N=336, 17%)		Recreational cannabis use (N=2,864, 83%)		Test statistic and p-value
		N/mean	Weighted %/(SE)	N/mean	Weighted %/(SE)	
Age	18-25	178	25%	2,034	36%	$\chi^2=20.34$, p<0.001
	26-34	54	20%	402	26%	
	35-49	61	24%	288	18%	
	50 or older	43	31%	140	19%	
Male		184	54%	1,551	62%	$\chi^2=4.24$, p=0.04
Race/ethnicity	Non-Hispanic White	210	73%	1,726	67%	$\chi^2=1.66$, p=0.20
	All others	126	27%	1,138	33%	
Education	Less than high school	65	14%	447	12%	$\chi^2=4.02$, p=0.27
	High school graduate	111	32%	965	31%	
	Some college	115	33%	918	28%	
	College graduate	45	20%	534	28%	
Employment	Employed full or part time	198	54%	1,946	72%	$\chi^2=17.10$, p<0.001
	Unemployed	44	12%	355	9%	
	Other (not in labor force)	94	34%	563	19%	
Past year major depression		46	14%	354	11%	$\chi^2=1.34$, p=0.25
Overall health	Excellent	65	14%	622	23%	$\chi^2=53.95$, p<0.001

	Medical cannabis use (N=336, 17%)		Recreational cannabis use (N=2,864, 83%)		Test statistic and p-value
	N/mean	Weighted %/(SE)	N/mean	Weighted %/(SE)	
Nicotine dependence	94	27%	511	18%	$\chi^2=5.77$, p=0.02
Past year alcohol abuse/dep.	63	13%	715	25%	$\chi^2=13.65$, p<0.001
Past month binge drinking	115	34%	1281	52%	$\chi^2=15.22$, p<0.001
Past year drug abuse/dep. (excl. cannabis)	19	5%	188	6%	$\chi^2=0.17$, p=0.68
Any past year drug use (excl. cannabis)	102	23%	1,025	34%	$\chi^2=7.76$, p=0.01
Past year cannabis abuse/dep.	47	11%	373	10%	$\chi^2=0.13$, p=0.72
Daily cannabis use	96	33%	301	11%	$\chi^2=31.17$ p<0.001
Level of functioning disability	7.20	(0.60)	5.05	(0.22)	t=-3.20, p=0.002
% with past yr. psych. distress	90	31%	677	20%	$\chi^2=5.65$, p=0.02

Table 2

Multivariable logistic regression evaluating factors associated with people who use medical cannabis compared to those who use recreational cannabis.

		Medical cannabis use vs. recreational cannabis use AOR (95% CI)
Age	18-25	(referent)
	26-34	1.06 (0.73, 1.55)
	35-49	1.49 (0.90, 2.47)
	50 or older	1.76 (0.94, 3.28)
Male		0.85 (0.59, 1.23)
Race	Non Hispanic White	(referent)
	All others	0.82 (0.49, 1.35)
Employment	Full/part time	(referent)
	Unemployed	1.81 (1.00, 3.28)
	Other (not in labor force)	1.31 (0.76, 2.26)
Overall health	Excellent	(referent)
	Very good	0.96 (0.60, 1.53)
	Good	1.83 (1.12, 2.99)
	Fair/poor	2.75 (1.41, 5.33)
Past year alcohol abuse or dependence		0.52 (0.34, 0.81)
Any past year illicit drug use (excluding cannabis)		0.52 (0.33, 0.83)
Nicotine dependence		1.02 (0.67, 1.55)
Daily cannabis use		4.29 (2.82, 6.55)
Level of functioning disability		1.05 (1.00, 1.09)
Past year psychological distress		1.20 (0.65, 2.21)