



Published in final edited form as:

*Drug Alcohol Depend.* 2019 February 01; 195: 13–15. doi:10.1016/j.drugalcdep.2018.11.009.

## Use of marijuana exclusively for medical purposes

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### Abstract

**Objectives:** To characterize the socio-demographic characteristics, medical conditions, and psychiatric comorbidities of users of marijuana for medical and non-medical purposes.

**Methods:** Data were from the National Epidemiological Survey on Alcohol and Related Conditions III, a US nationally representative in-person interview of 36,309 adults age 18 years in 2012–2013.

**Results:** In relation to non-medical only users (n = 3339), combined (n = 362) and medical only (n = 82) users had higher prevalence of every medical condition examined. As compared to the combined use group, those using marijuana only for medical purposes were much less likely to have anxiety, alcohol, or non-medical prescription opioid use disorders.

**Conclusions:** Medical-only users appear to use it for evidence-based medical reasons and have lower prevalence of substance use disorder than other marijuana users. Nonetheless, because most medical marijuana users also use non-medically, screening for psychiatric disorders and prevention efforts for cannabis use disorder should be implemented when authorizing medical marijuana.

### Keywords

Medical marijuana; Self-medication

## 1. Introduction

Randomized clinical trials provide mixed support of marijuana for treatment of chronic pain and spasticity (Stockings et al., 2018; Whiting et al., 2015) and weak support for treatment of nausea and vomiting due to chemotherapy, weight gain in HIV infection, and sleep

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#### Author disclosures

All authors declare they have no financial nor personal relationship with other people or organizations that could influence this work.

#### Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.drugalcdep.2018.11.009>.

disorders (Whiting et al., 2015). Advocates, however, tend to view marijuana as useful for a wider range of medical conditions.

Studies show that individuals who use medical marijuana are also likely to use it for recreational or non-medical purposes (Choi et al., 2017; Compton et al., 2017). While the likelihood of using medical marijuana increased among U.S adults between 2013–2015 (Han et al., 2018), pattern of use remained unchanged among adults who reported using marijuana exclusively for medical purposes over the same period. As policies continue to evolve regarding medical marijuana authorization practices and to help inform prevention efforts for substance use disorders, this study presents nationally representative data to characterize three groups of marijuana users: those who use it for 1) only non-medical purposes, 2) only medical purposes, and 3) medical and non-medical purposes.

## 2. Methods

Data were from the National Epidemiological Survey on Alcohol and Related Conditions III, a US nationally representative in-person interview of 36,309 adults age 18 years conducted in 2012–2013. Probability sampling selected respondents. Screener- and person-level response rates were 72.0% and 84.0%. The samples were weighted to adjust for nonresponse at the household and person levels, selection of one person per household, and oversampling of African Americans, Asians, and Hispanics. After weighting, the data were adjusted to be representative of the US adult population for variables including region, age, sex, race, and ethnicity based on the American Community Survey (Grant et al., 2015a). The study was approved by National Institutes of Health and Westat IRBs.

Participants were asked about past-year medical and non-medical marijuana use (for verbatim wording, see Supplementary material accessible from the online version of this paper at <http://dx.doi.org> and entering doi: <https://doi.org/10.1016/j.drugalcdep.2018.11.009>). Three groups of marijuana users were considered: non-medical only, medical only, and combined. We examined self-reported medical conditions with at least some empirical support for medical marijuana treatment (Whiting et al., 2015) including pain, arthritis, nerve problems, insomnia, and symptoms related to cancer, diabetes, and HIV. Pain interference was measured by the question “During the past 4 weeks, how much did pain interfere with your normal work, including both work outside the home and housework” with moderately, quite a bit, or extremely dichotomized as yes for pain. Presence of other medical conditions were assessed by subject positive response to “During the last 12 months, did a doctor or other health professional tell you that you had...” with the exception of HIV which was indicated by positive response to: “Did you EVER test positive for HIV or AIDS?”. Anxiety, mood and substance use disorders were assessed by DSM-5 criteria (APA, 2013) using the Alcohol Use Disorder and Associated Disabilities Interview Schedule-5 (AUDADIS-5) a computer-assisted interview that assesses substance use and psychiatric disorders with good reliability and validity (Grant et al., 2015b). Anxiety and mood disorders were considered due to the common belief that marijuana is effective for these disorders (Spiegel, 2013) despite little or no evidence (Stockings et al., 2018; Whiting et al., 2015). Group differences in physical and mental quality of life scores (Ware et al., 2002) on the SF-12 and substance use disorders were also examined. The physical quality of

life score is represented by role limitations-physical, bodily pain, physical functioning, and general health scales; while the mental quality of life score is represented by role limitations-emotional, vitality, social functioning, and mental health scales (Ware et al., 1996). Higher scores indicate better quality of life. Differences were tested using chi-square and t-tests using SAS Proc Survey Freq/Means to incorporate clustering and sampling weights. Results were considered significant at a  $p$ -value  $\leq .05$  (2-sided).

### 3. Results

Of the 9.8% (95% CI, 9.5%–10.0%) of US adults with any past-year marijuana use, 89.0% (88.1%–89.9%) reported non-medical only use, 2.3% (1.9%–2.7%) reported medical only use, and 8.7% (7.9%–9.6%) reported combined medical and non-medical use. Users of medical marijuana only were older than non-medical only users and combined users. No differences were found by gender or race/ethnicity.

Compared to non-medical only users, combined and medical only marijuana users had higher prevalence of all medical conditions and lower physical quality of life scores (Table 1). Furthermore, medical only users had a higher prevalence of cancer (15.6%, SE = 7.3%), diabetes (15.3%, SE = 4.7%), and pain interference (52.5%, SE = 7.0%), and lower mean physical quality of life scores (mean = 40.2, SE = 1.4) than combined users.

Medical-only marijuana users had either not significantly different or significantly lower prevalence of all psychiatric disorders than both of the non-medical using groups. Compared to non-medical only users, combined users had a higher prevalence of anxiety disorders (30.5%, SE = 3.0%), PTSD (15.9%, SE = 2.4%), and cannabis use disorder (41.5%, SE = 3.2%).

### 4. Discussion

In this large, nationally representative sample, we identified a subgroup of individuals who use marijuana exclusively for medical purposes. These adults, a small percentage of all marijuana users, had a distinctly higher prevalence of medical conditions for which there is at least some empirical support for marijuana treatment, including pain and symptoms related to cancer. They also were older and had distinctly lower physical quality of life scores. Those using marijuana only for medical purposes had lower prevalence of non-medical prescription opioid, alcohol and other drug use disorders than both other groups of marijuana users. This lower risk of substance use disorders is consistent with a report (Compton et al., 2017) using data from the National Survey on Drug Use and Health (NSDUH) that examined substance use (not disorder) and found medical only marijuana users had lower past-year prevalence of heavy alcohol use and lower use of non-medical prescription drugs than non-medical only marijuana users.

In comparison to non-medical only users, the present study using NESARC III found combined users were at much higher risk of anxiety and PTSD. This finding contrasts with the NSDUH study (Compton et al., 2017) which found increased anxiety disorders among medical only users compared to non-medical only users rather than increased risk of anxiety disorders for combined users. This difference may be due in part to the way subjects using

marijuana were identified as medical only versus combined users between the two surveys, or due to the NSDUH anxiety measure indicating if a person had been “told by a doctor” that they had an anxiety disorder whereas in NESARC III it was assessed by a structured diagnostic interview, or due to the different statistical modeling: the NSDUH study controlled for over 25 co-morbid measures simultaneously which may complicate comparisons of effects.

We also found a strikingly high prevalence of cannabis use disorder (41.5%) among combined users. By contrast, approximately one quarter (25.3%) of non-medical only users had cannabis use disorder. This finding refines a previous report using NESARC III data which reported higher rates of cannabis use disorder among medical users but aggregated medical only users with combined users (Choi et al., 2017). Our findings clarify the distinctive comorbidity profiles of adults who use marijuana only for medical purposes and those who combine medical and non-medical use of marijuana.

The present report has some limitations. The survey relied on self-report which may result in under reporting of use. Information was not available concerning the medical conditions for which marijuana was medically used, nor if it was specifically authorized by a physician rather than simply self-defined as medical marijuana use. Moreover, information was not available on the dose, duration, or means of cannabis ingestion. Finally, given the low prevalence of people who use marijuana just for medical purposes in this population, replication of the results should be done using larger more recent samples targeting medical marijuana users.

Medical-only marijuana users appear to use it for medical reasons for which there is at least some empirical evidence, and they also have lower prevalence of substance use disorders than other marijuana users. Nonetheless, because most medical marijuana users also use non-medically, screening for psychiatric disorders and efforts to prevent cannabis use disorder should be implemented when authorizing use of medical marijuana.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Funding

Work on this manuscript was supported by DA019606 from the National Institute of Drug Abuse (Drs. Olfson and Wall), R01DA034244 (Drs. Hasin and Wall), and the New York State Psychiatric Institute (Drs. Olfson, Wall, Hasin and Liu). The sponsors had no role in the design and conduct of the study; collection, management, analysis and no interpretation of the data; and preparation or approval of the manuscript.

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**Table 1**

Comparison of characteristics of adults with past year use of non-medical marijuana only, medical marijuana only, and combined use.

	1. Non-medical only		2. Medical only		3. Combined Use		Pairwise Comparison Ivs2,Ivs3,2vs3	Chi-square p-values
	N = 3339	% (SE)	N = 82	% (SE)	N = 362	% (SE)		
	N		N		N			
<b>DEMOGRAPHIC</b>								
<b>Sex</b>								
Male	1955	62.1(1.18)	48	58.75(6.57)	226	63.67(3.3)		0.60, 0.63, 0.42
Female	1384	37.9(1.18)	34	41.25(6.57)	136	36.33(3.3)		
<b>Age (years)</b>								
< 50	2733	83.08(0.85)	49	52.26(6.25)	273	74.83(3.37)		0.00, 0.00, 0.00
> = 50	606	16.92(0.85)	33	47.74(6.25)	89	25.17(3.37)		
<b>Race/Ethnicity</b>								
White, non-Hispanic	1726	65.68(1.39)	41	65.83(4.87)	196	62.49(2.99)		0.98, 0.32, 0.49
Other	1613	34.32(1.49)	41	34.17(4.87)	166	37.51(2.99)		
<b>MEDICAL CONDITIONS</b>								
Pain Interference <sup>a</sup>	713	19.67(0.93)	38	52.48(6.98)	126	35.79(2.37)		0.00, 0.00, 0.02
Arthritis <sup>b</sup>	340	9.14(0.61)	26	26.12(5.35)	79	23.32(3.19)		0.00, 0.00, 0.59
Nerve Problems <sup>b,g</sup>	322	9.72(0.66)	19	27.47(6.70)	71	21.09(1.98)		0.00, 0.00, 0.30
Insomnia <sup>b</sup>	247	6.84(0.48)	19	26.17(6.63)	55	17.45(2.79)		0.00, 0.00, 0.15
Cancer <sup>b</sup>	58	1.49(0.23)	5	15.64(7.29)	16	4.08(0.87)		0.00, 0.00, 0.00
Diabetes <sup>b</sup>	107	2.67(0.35)	12	15.26(4.71)	19	5.50(1.74)		0.00, 0.04, 0.02
HIV <sup>f</sup>	29	0.81(0.21)	1	0.51(0.50)	8	1.64(0.62)		0.52 <sup>e</sup> 0.02, 1.00 <sup>e</sup>
<b>PSYCHIATRIC DISORDERS<sup>c</sup></b>								
Anxiety disorder	630	19.40(1.04)	17	18.24(4.96)	95	30.49(2.96)		0.82, 0.00, 0.05
PTSD	337	10.00(0.83)	14	10.43(2.94)	54	15.86(2.42)		0.86, 0.01, 0.17
Mood disorder	787	23.87(1.00)	21	23.61(6.54)	100	27.88(2.28)		0.97, 0.10, 0.53
Cannabis use disorder	836	25.25(1.01)	N/A <sup>d</sup>	N/A <sup>d</sup>	136	41.54(3.21)		N/A, 0.00, N/A

	1. Non-medical only		2. Medical only		3. Combined Use		Pairwise Comparison Chi-square p-values Ivs2,1vs3,2vs3
	N = 3339	% (SE)	N = 82	% (SE)	N = 362	% (SE)	
Non-medical	136	4.43(0.41)	0	0.00 (0.00)	20	6.23(1.46)	0.08 <sup>e</sup> , 0.21, 0.03 <sup>e</sup>
prescription							
opioid use disorder							
Alcohol use disorder	1537	47.92(1.25)	19	19.74(4.31)	158	42.61(3.19)	0.00, 0.11, 0.00
Other drug use disorder	219	6.94(0.55)	2	1.25(1.23)	35	8.93(2.02)	0.17 <sup>e</sup> , 0.29, 0.03 <sup>e</sup>
	Mean (SE)		Mean (SE)		Mean (SE)		
<b>SF-12 Physical composite</b>	51.26(0.26)		40.19(1.40)		46.37(0.54)		0.00, 0.00, 0.00
<b>SF-12 Mental composite</b>	47.44(0.23)		44.66(0.92)		46.55(0.57)		0.02, 0.16, 0.16

<sup>a</sup>Response to “During the past 4 weeks, how much did pain interfere with your normal work, including both work outside the home and housework” of moderately, quite a bit, or extremely.

<sup>b</sup>Response to “During the last 12 months, did a doctor or other health professional tell you that you had...”

<sup>c</sup>AUDADIS structured interview of DSM-5 criteria was used to diagnose presence of past year psychiatric disorders. Anxiety disorder includes (Generalized Anxiety Disorder, Social Anxiety Disorder, Panic Disorder, and Specific Phobia), Mood disorder includes (Major Depressive Disorder, Manic Disorder, and Dysthymia), Other drug use disorder includes (cocaine, heroin, stimulant, sedatives, inhalants, club drugs, and hallucinogens).

<sup>d</sup>Cannabis use disorder was only assessed in NESARC if respondents used marijuana other than prescribed (i.e. non-medically). This N/A should not be interpreted as zero prevalence, but instead as unknown prevalence.

<sup>e</sup>Fisher’s exact test (rather than Chi-square) p-value used due to small cell count (<5). Fisher’s exact test is based on raw sample counts, not based on weighted prevalence values.

<sup>f</sup>Answer yes to questions “Did you EVER test positive for HIV or AIDS?”.

<sup>g</sup>combines fibromyalgia, reflex sympathetic dystrophy (RDS) or Complex Regional Pain Syndrome (CRPS), and any other nerve problem in your legs, arms or back.