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ADOLESCENTS' USE OF MEDICAL MARIJUANA: A SECONDARY ANALYSIS OF MONITORING THE FUTURE DATA

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INTRODUCTION

In 1970, cannabis (marijuana) was placed in Schedule 1 of the Controlled Substances Act by the United States Congress. At that time, marijuana was viewed as having "no accepted" medicinal use and thus, possession, cultivation or selling of marijuana was criminalized. However, since 1970, 23 States and the District of Columbia have legalized the use of medical marijuana. California, with the enactment of Proposition 215 in 1996, was the first state to make medical marijuana available for patients, allowing each patient to have 8 oz. of usable marijuana, 6 mature plants and 12 immature plants. Over the next 18 years other states joined California, although the amount and conditions for which marijuana can be medically recommended vary by state, and include a broad range of conditions such as nausea, vomiting, cachexia, epilepsy, generalized pain, glaucoma, and multiple sclerosis. And while Americans generally support medical marijuana laws (MML), one concern raised

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Contributors Statement

Carol J. Boyd: Dr. Boyd conceptualized and designed the study and discussed the study design with all coauthors. Boyd interpreted the data provided by Dr. Veliz, drafted the initial manuscript and all drafts of the manuscript, and approved the final manuscript as submitted.

Philip T. Veliz: Dr. Veliz analyzed and interpreted the data, reviewed and revised the manuscript, and approved the final manuscript as submitted.

Sean Esteban McCabe: Dr. McCabe, conceptualized and designed the study, reviewed and revised the manuscript, and approved the final manuscript as submitted.

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by opponents of MML is that “medicalizing” marijuana would lead to an increase in adolescents’ use of it.

The National Survey of Drug Use and Health (NSDUH) estimates that 76 percent of adolescents get their marijuana from a friend or family member,[1] but whether the source originates with a medical marijuana patient or dispensary is undetermined. Indeed, the data on adolescents’ medical marijuana use are mixed; although the best designed studies have found no increase in adolescent’s use after MML were enacted in their state. Wall and colleagues [2] in their analysis of the 2002–2008 NSDUH data found states with MML had higher than average adolescents marijuana use. However, when Harper et al.[3] used a difference-on-difference study design with the same data used by Wall et al., they found that there was no significant increase in adolescents’ marijuana use after enactment of MML. Data from the Youth Risk Behavior Survey during approximately the same period [4,5] found no measurable effect on adolescent marijuana use. In a study of youth in substance abuse treatment (n=164), Salomonsen-Sautel and colleagues[6] found that 74% of their sample used medical marijuana a median of 50 times; however, *they were using someone else’s medical marijuana.*

To date, the studies on adolescents’ medical marijuana use have often been with state-specific, regional or clinical populations[3–8] and thus, this study represents the first to report on a nationally representative sample of 12th graders’ *medical marijuana use, whether used legally or illegally* and its relationship to other drug use using data from the 2012 and 2013 *Monitoring the Future* study (MTF).[9]

METHODS

In 2012 and 2013 MTF questions were asked about medical marijuana on form 1 with 12th graders and these data were used for this study.[10] The total weighted sample size was 4579 12th graders (2012: n = 2367; 2013: n = 2212). After respondents with missing data on past year marijuana use were excluded, the final weighted sample was 4394 12th graders.

For the purposes of this study, four groups were created: (1) nonusers, (2) illicit users, (3) medical users, and (4) diverted medical marijuana users. Binary variables were created from three questions in the MTF survey: “On how many occasions have you used marijuana during the last 12 months”, “Where did you get the marijuana you used during the last year? (Response: “From my own 'medical marijuana' prescription”) and “Did you get any of the marijuana you used during the last year from someone else's medical marijuana prescription?” Respondents who used medical marijuana from both their own prescription and someone else’s were included in the group of respondents who used from their own medical marijuana source. We note that the term ‘medical marijuana prescription’ is technically not the correct terminology since marijuana remains in Schedule 1 and technically, cannot be prescribed. However, the public uses the term ‘marijuana prescription’ and this is the language used in MTF.

RESULTS

We examined sample demographic characteristics and used binary logistic regression to compute adjusted odds ratios to determine risk of repeatedly using marijuana and using other types of substances among Groups 2–4.

Approximately 1.1% of 12th graders indicated using medical marijuana from their own prescription during the past 12 months (Notably, 35% [n = 17] of these users also used from someone else's prescription). Six percent (6.1%) of the 12 graders indicated using medical marijuana from someone else's medical marijuana prescription during the past 12 months (see table 1).

Table 2 indicates that medical users, when compared to the referent group (illicit users), had higher odds of engaging in *most of the examined behaviors*: using marijuana on 40 or more occasions in the previous year (AOR=3.30 95% CI=1.64, 6.62), using marijuana daily (AOR=4.09 95% CI=1.87,8.90), using marijuana because "I am hooked" (AOR=10.2 95% CI=3.25, 32.3), using illegal prescription drugs (AOR=2.26 95% CI=1.12, 4.55), and using illicit drugs other than marijuana (AOR=2.32 95%=1.10,4.90).

However, diverted medical marijuana users had higher odds of engaging in *all the examined behaviors*: using marijuana on 10 or more occasions (AOR=4.54 95%=3.12,6.62); using marijuana on 40 or more occasions (AOR=3.09 95%=2.14,4.45); using marijuana daily (AOR=3.9795% CI=2.78, 5.67); using marijuana to get high (AOR=1.96 95% CI=1.31, 2.92); using marijuana because of being "hooked" (AOR=4.61 95% CI=2.20, 9.65); indicating being drunk during the past year (AOR = 2.07 95% CI=1.23,3.49), using illegal prescription drugs (AOR=3.82 95%, CI=2.56, 5.71) and using illicit drugs other than marijuana (AOR=2.35 95% CI=1.49, 3.71).

DISCUSSION

This study is the first to use national data drawing attention to adolescents' use of medical marijuana. These data indicate that the highest risk group is adolescents that use someone else's diverted medical marijuana, followed by medical marijuana users. This noted and to place these data in context, the diversion of medical marijuana was an uncommon activity, with only 4% of 12th graders reporting use from a diverted medical source. Our findings are in line with researchers who have reported little increase in adolescents' marijuana use in states with medical marijuana.[3–5]

There were sex, race/ethnicity and regional differences among the groups. Males were more likely to report illicit, medical and diverted medical use than their female counterparts, and this is consistent with the NSDUH findings[1] that show that adolescent males generally have higher prevalence rates of marijuana use. In our sample, Whites and Hispanics were more likely to be medical users, as compared to Blacks. We can speculate that these ethnic and racial differences may be associated with regional differences, since the West has disproportionate Hispanic populations and has the most States that allow medical marijuana (e.g., California); this is in contrast to southern states that have no MML.

Although this exploratory, cross-sectional study provides important insights into the use of medical marijuana and in particular, those adolescents using someone else's medical marijuana, the study has some limitations. Relatively few adolescents use medical marijuana and thus, cell sizes are small. Further, data from MTF are derived from surveys of adolescents in school, and thus, the highest risk students for substance use may not be captured in the sample.

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References

1. Substance Abuse and Mental Health Services Administration (SAMSHA). Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.
2. Wall MM, Poh E, Cerda M, Keyes KM, Gallea S, Hasin DS. Adolescent marijuana use from 2002 to 2008: Higher in states with medical marijuana laws, cause still unclear. Ann Epidemiol. 2011; 21(9):714–716. [PubMed: 21820632]
3. Harper S, Strumpf EC, Kaufman JS. Do medical marijuana laws increase marijuana use? Replication study and extension. Ann Epidemiol. 2012; 22(3):207–212. [PubMed: 22285867]
4. Lynne-Landsman SD, Livingston MD, Wagenaar AC. Effects of state medical marijuana laws on adolescent marijuana use. Am J Public Health. 2013; 103(8):1500–1505. [PubMed: 23763418]
5. Choo EK, Benz M, Zaller N, Warren O, Rising KL, McConnell KJ. The impact of state medical marijuana legislation on adolescent marijuana use. J Adolesc Health. 2014; 55:160–166. [PubMed: 24742758]
6. Salomonsen-Sautel S, Sakai JT, Thurstone C, Corley R, Hopfer C. Medical marijuana use among adolescents in substance abuse treatment. J Am Acad Child Adolesc Psychiatry. 2012; 51(7):694–702. [PubMed: 22721592]
7. Ryan-Ibarra S, Induni M, Ewing D. Prevalence of medical marijuana use in California, 2012. Drug Alcohol Rev. 201410.1111/dar.12207
8. Reinarman CC, Nunberg HH, Lantheir FF, Heddleston TT. Who are medical marijuana patients? Population characteristics from nine California assessment clinics. J Psychoactive Drugs. 2011; 43(2):128–135. [PubMed: 21858958]
9. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE.; Miech, RA. Monitoring the Future National Survey Results on Drug Use, 1975–2013. Volume I: Secondary School Students. Ann Arbor, MI: University of Michigan Institute for Social Research; 2014.
10. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future: A Continuing Study of American Youth (12th-Grade Survey), 2012: Base Year Question Index, 1976–2012. Ann Arbor: Institute for Social Research, University of Michigan; 2013.

IMPLICATIONS AND CONTRIBUTION

Our data indicate that those adolescents using diverted medical marijuana have higher odds of engaging in both marijuana and other types of substance use. This study also shows that relatively few adolescents have medical papers to legally use medical marijuana, relatively few adolescents are obtaining their marijuana from “medical” sources, and that most adolescents continue to get their marijuana from illicit sources.

Table 1

Sample Characteristics by Different Types of Marijuana Users (n = 4418; unweighted/n = 4394; weighted)

	Group 1 *Non-Users* **No past year marijuana use (n = 2817; 64.1%)[a]**	**Group 2** *Illicit Users* **Past year marijuana use that was not from a legal or medial source (n = 1263; 28.8%)[a]**	**Group 3** *Medical Users* **Past year marijuana use from their own prescription (n = 48; 1.1%)[a]**	**Group 4** *Diverted Medical Marijuana Users* **Past year marijuana use from someone else's prescription (n = 266; 6.1%)[a]**	
Demographics (%)[a]	**%**	**%**	**%**	**%**	
Sex					<.001
Male (45.3)	43.1	49.2	66.7	57.7	
Female (46.8)	52.2	42.7	12.5	31.1	
Missing Response (7.9)	4.7	8.1	20.8	11.2	
Race					<.001
White (56.5)	58.4	59.6	34.0	49.6	
Black (10.1)	11.4	8.3	10.6	3.8	
Hispanic (13.8)	14.1	12.3	21.3	20.3	
Other Race/Missing[c](19.6)	16.1	19.8	34.0	26.3	
Urbanicity					<.001
Large MSA/Urban (31.2)	29.5	31.4	18.8	47.4	
Other MSA/Suburban (48.7)	48.3	49.6	66.7	44.7	
Non-MSA/Rural (20.1)	22.2	19.0	14.6	7.9	
U.S. Region					<.001
North East (17.0)	16.5	21.1	8.5	5.2	
North central (25.0)	26.6	24.4	12.8	16.5	
South (33.9)	35.5	33.5	19.1	13.9	
West (24.1)	21.4	21.1	59.6	64.4	

Note. Due to missing responses on past year marijuana use questions, 170 respondents (unweighted)/185 respondents (weighted) were removed from the analysis.

[a] Weighted estimates are provided.

[b] $\chi 2$ test of the overall association between different types of marijuana users and each demographic.

[c] The public use MTF data censors respondents race to only identify White, Black, and Hispanic respondents. Respondents racial identities who are 'Other Race' are censored due to issues of confidentiality.

Table 2

Comparing Marijuana Use, Motivations for Marijuana Use, and Other Types of Substance Use between Illicit Users and Medical Users/Diverted Medical Users (weighted estimates are presented; n = 1577)

	Used marijuana on 10 or more occasions during the past year[a] (n = 1577)			Used marijuana on 40 or more occasions during the past year[a] (n = 1577)			Used marijuana on a daily basis for at least one month during the past year[b] (n = 1577)			Used marijuana to get high[c] (n = 1577)			Used marijuana because I am "hooked"[c] (n = 1577)			Was drunk on at least one occasion during the past year[d] (n = 1337)			Nonmedically used prescription drugs on at least one occasion during the past year[e] (n = 1496)			Used illicit drugs other than marijuana on at least one occasion during the past year[f] (n = 1544)		
	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)	%	AOR	(95% CI)
Illicit Users (n = 1263)	46.1%	1.00		26.5%	1.00		30.2%	1.00		64.1%	1.00		2.9%	1.00		78.7%	1.00		21.2%	1.00		13.5%	1.00	
Medical Users (n = 48)	64.6%	2.05	(.985, 4.29)	56.3%	3.30***	(1.64, 6.62)	63.8%	4.09***	(1.87, 8.90)	70.2%	1.36	(.653, 2.87)	12.5%	10.2***	(3.25, 32.3)	72.2%	.805	(.297, 2.18)	31.1%	2.26*	(1.12, 4.55)	29.2%	2.32*	(1.10, 4.90)
Diverted Medical Users (n = 266)	76.7%	4.54***	(3.12, 6.62)	48.9%	3.09***	(2.14, 4.45)	59.4%	3.97***	(2.78, 5.67)	78.7%	1.96**	(1.31, 2.92)	6.4%	4.61***	(2.20, 9.65)	86.4%	2.07**	(1.23, 3.49)	44.9%	3.28***	(2.56, 5.71)	28.7%	2.35***	(1.49, 3.71)

Notes.

*p<.05,

**p<.01,

***p<.001;

% = percent who indicated the observed outcome; AOR = adjusted odds ratio; CI = confidence interval. AORs control for the following known correlates of substance use in the MTF and include the following: sex, race, average grade in school, number of nights respondent go out in a typically week, cut class during the past year, employment status, parents education, number of parents in the household, year respondent participated in the MTF, urbanicity, and U.S. region.[10] Further, missing data on the control variables were dummy coded in order to retain a large portion of the sample. Sample sizes vary due to missing data on the dependent variable of interest.

[a] These binary variables were constructed from the following question: "On how many occasions (if any) have you used marijuana during the last 12 months". Response options ranged from 0 to 40 or more occasions.

[b] This binary variable was constructed from the following question: "How recently did you use marijuana or hashish on a daily, or almost daily, basis for at least a month". Response options ranged from past month to 3 or more years ago.

[c] These binary variables were constructed from the following questions: "What have been the most important reasons for using marijuana or hashish?" Respondents could select either "To feel good or get high" or "Because I am 'hooked'".

[d] This binary variable was constructed from the following question: "On how many occasions (if any) have you been drunk or very high from drinking alcoholic beverages during the past 12 months". Response options ranged from 0 to 40 or more occasions.

[e] This binary variable was constructed from four separate questions that asked respondents if they used the following categories of prescription drugs without a doctors orders during the past 12 months: "amphetamines", "narcotics", "sedatives", "tranquilizers". All response options ranged from 0 to 40 or more occasions.

[f] This binary variable was constructed from five separate questions that asked respondents if they used the following drugs during the past 12 months: "crack", "cocaine in any other form", "heroin", "LSD" and "Hallucinogens other than LSD". All response options ranged from 0 to 40 or more occasions.