

Cannabis Use History and Characteristics of Quit Attempts: A Comparison Study of Treatment-Seeking and Non-Treatment-Seeking Cannabis Users

Lauren R. Pacek and Ryan Vandrey
Johns Hopkins University School of Medicine

Cannabis is the most commonly used illicit substance worldwide, and cannabis use disorders (CUDs) are correspondingly high. Increased demand for treatment and relatively low rates of positive clinical outcomes has led to a large scientific investment in the development of interventions for the treatment of CUD. Much of this research is conducted with cannabis users who are not seeking treatment at the time of study participation, and it is unknown whether these individuals are representative of those who seek treatment. This study contrasted samples of cannabis users participating in screening interviews for treatment and nontreatment research studies. Several differences between groups emerged: Treatment-seekers were more likely to be female (43% vs. 29%), older (33.4 vs. 29.7 years), and have longer cannabis use histories compared with non-treatment-seekers ($p = .007$). Treatment-seekers were more likely to report experiencing guilt after using cannabis and to feel that cannabis use has been a problem for them. Additionally, treatment-seekers reported a greater mean number of reasons for making a quit attempt, experiencing a greater number of withdrawal symptoms, and employing more coping strategies during prior quit attempts. Despite the aforementioned differences, the 2 groups were similar on several key characteristics, particularly with regards to current levels of cannabis use and related problems.

Keywords: cannabis, cannabis use disorder, treatment

Cannabis continues to be the most widely used illicit substance in the world (UNODC, 2012; WHO, 2014). Cannabis use disorders (CUD) are relatively prevalent worldwide, and were recently estimated to occur in approximately 9% of cannabis users in the United States (Meier et al., 2012). The number of individuals seeking treatment for CUD has been increasing in the United States, Europe, and Australia (SAMHSA, 2010; EMCDDA, 2008; NCPIC, 2012).

Clinical research has demonstrated that a variety of evidence-based psychosocial therapies are effective treatments for CUD, including motivational interviewing (MI), cognitive-behavioral therapy (CBT), and contingency management (CM; Davis et al., 2014). Despite this, most individuals who enter treatment fail to achieve sustained periods of abstinence despite having a reported desire to quit (Budney, Roffman, Stephens, & Walker, 2007; Davis et al., 2014). An expanding portfolio of research is being conducted to improve understanding of cannabis use, consequences, and cessation with the aim of improving treatment outcomes.

Much of this research is conducted with frequent cannabis users who are not seeking treatment at the time of study participation. Examples include early Phase I/II trials of medications that are potential pharmacotherapies and laboratory studies designed to model craving, withdrawal, drug self-administration and relapse. While essential for cost-effective evaluation and development, little research has been conducted to evaluate whether the non-treatment-seeking cannabis users who volunteer for these studies are representative of the population that presents for treatment.

Research with other substances of abuse has been conducted to explore demographic similarities and differences between samples of treatment-seeking and non-treatment-seeking research participants. Findings indicate that treatment-seeking and non-treatment-seeking samples are largely similar, with some noteworthy differences.

Briefly, Carroll and Rounsaville (1992) and Smith, Dent, Coles, and Falek (1992) found that treatment- and non-treatment-seeking cocaine users were comparable on measures of severity of cocaine use, though non-treatment-seeking cocaine users tended to experience fewer problems and negative consequences as a result of their drug use. Rounsaville and Kleber (1985) explored differences between opiate-dependent individuals seeking treatment versus those not seeking treatment and found that while both treatment-seeking and non-treatment-seeking participants were similar on duration and severity of opiate use, non-treatment-seekers tended to report more adequate social functioning and fewer problems related to their substance use.

Though published reports are available that characterize samples of treatment-seeking cannabis users (Copeland, Swift, & Rees, 2001; Stephens, Babor, Kadden, Miller, & the Marijuana Treatment Project Research Group, 2002; Stephens, Roffman, & Simpson, 1993; Strike, Urbanoski, & Rush, 2003) and non-

This article was published Online First August 25, 2014.

Lauren R. Pacek and Ryan Vandrey, Department of Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine.

Ryan Vandrey conceptualized the research question and Lauren R. Pacek wrote the first draft of the manuscript. Both authors contributed to subsequent revisions, and have approved of the final draft of the manuscript. This work was funded by the following National Institute on Drug Abuse grants: T32 DA007209 (Pacek, P.I.: George Bigelow), R21-DA025794 (Vandrey), R01-DA025044 (Vandrey), U01-DA031784 (Vandrey).

Correspondence concerning this article should be addressed to Lauren R. Pacek, 5510 Nathan Shock Drive, Suite 1708, Baltimore, MD 21224. E-mail: lpacek@jhmi.edu

treatment-seeking cannabis users (Buchowski et al., 2011; Copersino et al., 2006a; Copersino et al., 2006b; Levin et al., 2010; Stein, Hagerty, Herman, Phipps, & Anderson, 2011), no studies have provided a direct comparison of these two groups. The present study was conducted to perform such a comparison in order to identify unique characteristics of those who seek treatment, and also evaluate the degree to which research volunteers for laboratory-based clinical research studies are representative of those who seek formal treatment.

Method

Participants

Participants represent a cohort of volunteers who were evaluated for laboratory and clinical research studies of cannabis at the Johns Hopkins University Behavioral Pharmacology Research Unit (BPRU) between November 2008 and November 2013. The BPRU is a broad-based substance abuse clinical research program located in Baltimore, Maryland that encompasses both human laboratory research and outpatient treatment research for a variety of legal and illegal substances. The laboratory studies included in this evaluation consisted of residential studies lasting between 20 and 52 days in duration, requiring between 13 and 52 residential nights (Vandrey, Smith, McCann, Budney, & Curran, 2011; Vandrey et al., 2013). The clinical study involved participation in a 12-week outpatient treatment program (currently ongoing). All studies included administration of investigational medications (i.e., dronabinol, zolpidem), and the residential studies involved cannabis self-administration.

All study volunteers were screened over the telephone for initial research eligibility prior to completing clinical interviews and assessments in person.

Participation was limited to current cannabis users (verified via urine toxicology test) between the ages of 18 and 55 who were physically healthy and reported experiencing withdrawal during prior periods of abstinence. In total, 205 volunteers were evaluated for research eligibility. Of those, 74 wanted to quit/reduce their cannabis use and were seeking formal treatment and 131 were volunteering for paid research participation and expressed no desire to stop or reduce cannabis use.

Assessments

The Marijuana Quit Questionnaire (MJQQ; Boyd et al., 2005; Copersino et al., 2006a) was administered to all participants using pencil and paper during the intake assessment. The MJQQ is a 176-item, individually administered, self-report questionnaire that collects data on demographic information, cannabis use history, and information about prior attempts to quit cannabis use including: reasons for quitting and resuming use; coping strategies used while quitting (Boyd et al., 2005); withdrawal symptoms experienced (yes/no) during quit attempts, and intensity of experienced symptoms (1 = *very little* to 5 = *very high*) (Copersino et al., 2006a); and substance use prior to and during quit attempts.

Within the MJQQ, participants were given a list of 26 potential reasons for quitting cannabis use, and were asked to rate the extent to which each reason matched their personal reasons for initiating their most difficult prior quit attempt using a scale from 0 to 4 (0 =

not at all, 1 = *a little*, 2 = *moderately*, 3 = *quite a bit*, 4 = *extremely/very much*). Dichotomous variables were created based on these possible response options ("not at all" vs. "a little or greater").

Participants also rated the extent to which their most difficult prior quit attempt affected their consumption of other legal and illegal substances. To assess reasons for cannabis relapse, participants were asked "Why did you start smoking cannabis again after your quit attempt?" and asked to select all that applied from a list of 28 potential reasons.

Before answering questions related to the "most difficult" quit attempt, participants were presented with the following: "Now think of the most difficult time you had intentionally stopping all marijuana use (while not in a controlled environment such as jail or hospital). Please answer all the following questions only as related to that quit attempt. If more than one quit attempt was of the same difficulty, please use the longest quit attempt."

Statistical Analyses

The sample was restricted to individuals who had made a quit attempt at some point in their lives [83% of non-treatment-seekers (131/158) and 86% of treatment-seekers (74/86)], leaving a total sample of 205 current cannabis users for the present analyses. Statistical significance of differences between treatment-seeking and non-treatment-seeking cannabis users on the basis of sociodemographic and cannabis use history, quit attempt characteristics, reasons for attempting to quit, use of coping strategies, substance use, and reasons for resuming cannabis use was established using *t* tests for comparisons of means and chi-square (χ^2) tests for comparisons of categorical data. Analyses of use of substances other than cannabis were limited to individual substances endorsed by 5% or more of the sample. All analyses were completed using STATA version 13.0 statistical software (StataCorp, 2013).

Results

Sociodemographic and Cannabis Use History Characteristics

Participant characteristics are shown in Table 1. Treatment seekers were more likely to be female $\chi^2(1, n = 205) = 4.26, p = .039$ and were older than non-treatment-seeking participants, $t(201) = -2.7406, p = .007$. Despite initiating first cannabis use ($p = 0.860$) and frequent cannabis use ($p = .712$) at similar ages, treatment seekers had longer histories of overall use, $t(201) = -2.7348, p = .007$ and frequent use, $t(201) = -2.6145, p = .010$, likely reflective of the age difference between the two samples.

Additionally, treatment-seeking participants were more likely to report feeling guilt or remorse following cannabis use $\chi^2(1, n = 205) = 7.11, p = .008$, as well as to report feeling that cannabis use has been a problem for them at some point during their lives ($\chi^2(1, n = 205) = 31.20, p < .001$). Conversely, non-treatment-seekers reported smoking more blunts (i.e., cannabis cigarettes rolled using cigar paper) during an average 24-hour period prior to their previous "most difficult" quit attempt than did treatment seekers, $t(197) = 3.3577, p < .001$. No significant differences were observed between treatment seekers and non-treatment-

Table 1
Sociodemographic and Cannabis Use Characteristics

Characteristic	Non-treatment-seekers (<i>n</i> = 131)	Treatment seekers (<i>n</i> = 74)	<i>p</i> -value
Sociodemographics			
Age (mean, <i>SD</i>)	29.7 (8.5)	33.4 (10.7)	0.007
% Male	71.0	56.8	0.039
% Af. American	82.3	86.5	0.436
% Unemployed	75.4	70.3	0.426
% >High school education	80.9	90.5	0.068
% Never married	83.1	79.7	0.771
Cannabis use			
Age at first use (mean, <i>SD</i>)	14.7 (2.7)	14.6 (4.0)	0.860
Age of frequent use (mean, <i>SD</i>)	16.8 (3.7)	17.0 (4.2)	0.712
Total years of use (mean, <i>SD</i>)	15.0 (8.7)	18.8 (10.9)	0.007
Years of frequent use (mean, <i>SD</i>)	13.0 (8.2)	16.5 (10.5)	0.010
Days used in past 30 (mean, <i>SD</i>)	28.6 (4.3)	27.7 (6.8)	0.249
# of blunts smoked per occasion	2.2 (1.6)	2.0 (1.4)	0.511
# of blunts smoked in 24 hours	6.6 (5.2)	4.4 (2.5)	<0.001
% Meet CUD criteria	93.1	90.5	0.507
% Cannabis abuse criteria	80.1	81.1	0.872
% Cannabis dependence criteria	74.8	81.1	0.305
% Prior formal treatment	7.6	13.5	0.260
% Report guilt after use	22.9	40.5	0.008
% Report problems related to cannabis use	27.5	67.6	<0.001
Age cannabis became a problem (mean, <i>SD</i>)	20.7 (18.66)	22.0 (8.20)	0.420

Note. *SD* = standard deviation; CUD = cannabis use disorder (cannabis abuse and/or dependence).

seekers on the basis of *DSM-IV-TR* (APA, 2000) criteria for cannabis abuse or dependence ($p = .507$).

Characteristics of Prior Attempts to Quit

Characteristics of quit attempts are shown in Table 2. Treatment seekers and non-treatment-seekers reported making a similar number of lifetime quit attempts ($p = 0.087$), and similar proportions from each group reported a past-year quit attempt ($p = 0.260$).

During prior quit attempts, treatment seekers reported having achieved a significantly longer period of complete abstinence compared with non-treatment-seekers, $t(201) = -5.2724$, $p < .001$. When reporting about their most difficult prior quit attempt, treatment seekers reported a significantly greater number of withdrawal symptoms, $t(191) = -5.5454$, $p < .001$ and having engaged in that quit attempt more recently, $t(201) = 2.1845$, $p = .030$ than non-treatment-seekers.

Reasons for the Quit Attempt

Reasons for attempting to quit cannabis use are shown in Table 3. The most commonly endorsed reasons for initiating a quit

attempt were “To save the money that I spent on cannabis” (78.2%), “To prove to myself that I wasn’t addicted” (60.4%), and “So that I could feel in control of my life” (56.3%). Conversely, reasons such as “I knew other people who had health problems caused by cannabis” (12.2%), “I was worried that cannabis use would shorten my life” (17.3%), “To avoid a conviction or jail sentence” (19.3%) and “Someone gave me an ultimatum” (19.8%) were less commonly endorsed. When comparing the two groups, treatment seekers were significantly more likely to endorse a variety of individual reasons for quitting (see Table 3), and, on average, endorsed a significantly greater number of reasons than non-treatment-seekers, $t(203) = -3.1074$, $p = .002$. Items with the greatest disparity between individuals seeking treatment compared with non-treatment seekers tended to relate to self-image and positive life change (e.g., would like myself better, want to get control of life, to increase energy, be more productive during the day, be a good example for children).

Coping Strategies

Characteristics of the coping strategies reported by cannabis users during their most difficult quit attempt can be found in

Table 2
Characteristics of Prior Quit Attempt(s)

Characteristic	Non-treatment-seeking (Mean + <i>SD</i>)	Treatment seeking (Mean + <i>SD</i>)	<i>p</i> -value
Number of quit attempts	4.3 (10.4)	7.4 (4.3)	0.087
Longest time quit (days)	6.7 (4.2)	292.2 (555.3)	<0.001
% Attempting to quit in past year	76.1	68.9	0.260
Days since most difficult attempt	1329.3 (1032.4)	853.4 (1061.9)	0.030
Days of abstinence achieved	165.3 (412.8)	156.7 (44.2)	0.895
# of withdrawal symptoms	8.8 (4.9)	13.0 (5.1)	<0.001
Average intensity of withdrawal	3.4 (0.8)	3.2 (0.9)	0.057

Table 3

Self-Reported Reasons for Making a Quit Attempt

Reason	Total sample	Non-treatment-seeking	Treatment seeking	p-value
Number of reasons, mean (<i>SD</i>)	9.2 (6.4)	8.2 (6.3)	11.0 (6.3)	0.002
I would like myself better	45.2	36.3	60.3	0.001
So I wouldn't have to leave social events/other people's homes	27.9	25.8	31.5	0.389
To feel in control of my life	56.3	47.6	71.2	0.001
Spouse/children/others would stop nagging me	44.2	38.7	53.4	0.045
To get praise from people I am close to	26.9	22.6	34.2	0.075
Using marijuana didn't fit who I want to be	46.2	35.5	64.4	<0.001
Using marijuana is becoming less socially acceptable	24.9	19.3	34.3	0.020
Someone gave me an ultimatum	19.8	19.3	20.5	0.839
To avoid health problems	41.1	37.9	46.6	0.232
Concern about suffering serious illness	25.4	22.6	30.1	0.239
People would be upset if I didn't quit	28.4	25.0	34.2	0.165
To get more things done during the day	51.3	43.5	64.4	0.005
Marijuana was hurting my health	34.0	30.6	39.7	0.194
To save money	78.2	72.6	87.7	0.013
To prove to myself that I wasn't addicted	60.4	56.4	67.1	0.139
There is drug testing where I work	45.7	41.9	52.0	0.169
I knew other people who had marijuana-related health problems	12.2	8.9	17.8	0.064
Marijuana would shorten my life	17.3	11.3	27.4	0.004
Marijuana-related legal problems	20.7	22.4	17.8	0.442
To avoid a conviction or jail sentence	19.3	20.2	17.8	0.686
To avoid involvement in criminal activities	23.3	19.3	30.1	0.084
I don't want to be a bad example for children	55.3	47.6	68.5	0.004
To have more energy	54.3	42.7	74.0	<0.001
So my hair and clothes wouldn't smell like marijuana	34.0	26.6	46.6	0.004
To avoid burning holes in clothes/furniture	22.4	19.5	27.4	0.201

Table 4. Common coping strategies reportedly used during quit attempts included getting rid of cannabis (58.1%) and getting rid of cannabis paraphernalia (46.0%), while medical or counseling approaches, such as attending self-help groups, counseling/therapy, physician care, prescription and nonprescription medication, herbal medicine, and acupuncture were much less commonly reported (<10%). Treatment seekers reported utilizing significantly more coping strategies during their quit attempt than did non-treatment-seekers, $t(190) = -3.1154, p = .0021$. With regard to individual coping strategies, treatment seekers were significantly more likely to report that they "stopped associating with people who smoke cannabis" $\chi^2(1, n = 198) = 5.37, p = .021$; "stopped going places where cannabis was smoked" $\chi^2(1, n = 199) =$

4.20, $p = .041$; "got rid of my cannabis paraphernalia" $\chi^2(1, n = 198) = 5.50, p = .019$; "attended a self-help group" $\chi^2(1, n = 198) = 8.24, p = .014$; and "got counseling/psychotherapy" $\chi^2(1, n = 198) = 13.35, p < .001$ compared with non-treatment-seekers.

Substance Use

Self-reported substance use can be found in Table 5. During the 6 months prior to participants' most difficult quit attempt, reported use of caffeine, alcohol, tobacco, and non-narcotic pain medications did not differ by treatment-seeking status. However, treatment seekers were more likely to report increasing their use of

Table 4

Self-Reported Coping Strategies Utilized During Most Difficult Quit Attempt

Coping strategy	Non-treatment-seeking	Treatment seeking	p-value
Number of strategies used, mean (<i>SD</i>)	2.7 (0.20)	3.8 (0.29)	0.002
Encouragement from family	33.1 (42)	43.1 (31)	0.160
Encouragement from friends	30.2 (38)	40.3 (29)	0.148
Stopped associating with people who smoke cannabis	27.0 (34)	43.1 (31)	0.021
Stopped going places where cannabis was smoked	33.9 (43)	48.6 (35)	0.041
Got rid of cannabis	53.2 (67)	66.7 (48)	0.064
Got rid of cannabis paraphernalia	39.7 (50)	56.9 (41)	0.019
Attended a self-help group	2.4 (3)	12.5 (9)	0.004
Counseling/psychotherapy	2.4 (3)	16.7 (12)	<0.001
Religious support/prayer	23.0 (29)	23.6 (17)	0.924
Saw a physician	1.6 (2)	1.4 (1)	0.912
Took nonprescription medication	5.6 (7)	11.1 (8)	0.155
Took prescription medication	3.2 (4)	0 (0)	0.127
Took herbal medicine, vitamins, nutritional supplement	11.9 (15)	8.3 (6)	0.432

Table 5
Self-Reported Substance Use and Changes in Substance Use During Most Difficult Quit Attempt

	Non-treatment-seekers	Treatment seekers	<i>p</i> -value
Caffeine			
Using before attempt	78.3 (101)	67.1 (47)	0.085
Increased during attempt	11.6 (15)	7.1 (5)	0.063
Decreased during attempt	20.2 (26)	10.0 (7)	
No change during attempt	48.1 (62)	51.4 (36)	
Not using at time of quit attempt	20.2 (26)	28.6 (20)	
Started using during attempt	0 (0)	2.7 (2)	
Alcohol			
Using before attempt	72.1 (93)	72.1 (49)	0.996
Increased during attempt	20.2 (26)	28.6 (20)	0.016
Decreased during attempt	20.9 (27)	4.3 (3)	
No change during attempt	34.1 (44)	40.0 (28)	
Not using at time of quit attempt	24.8 (32)	27.1 (19)	
Started using during attempt	0 (0)	0 (0)	
Tobacco			
Using before attempt	68.2 (88)	67.1 (47)	0.877
Increased during attempt	27.9 (36)	35.7 (25)	0.509
Decreased during attempt	12.4 (16)	11.4 (8)	
No change during attempt	26.4 (34)	25.7 (18)	
Not using at time of quit attempt	32.6 (42)	24.3 (17)	
Started using during attempt	0.8 (1)	2.9 (2)	
Non-narcotic pain medications			
Using before attempt	26.6 (34)	31.4 (22)	0.467
Increased during attempt	7.9 (10)	10.0 (7)	0.835
Decreased during attempt	3.1 (4)	4.3 (3)	
No change during attempt	20.5 (26)	25.7 (18)	
Not using at time of quit attempt	66.9 (85)	58.6 (41)	
Started using during attempt	1.6 (2)	1.4 (1)	

alcohol during their quit attempt (28.6% vs. 20.2%) while non-treatment-seekers were more likely to report decreasing their alcohol use (20.9% vs. 4.3%; $\chi^2(1, n = 199) = 10.26, p = .016$).

Reasons for Resuming Use

All participants were current cannabis users at the time these assessments were conducted, and had thus resumed use of cannabis following their most difficult prior quit attempt. The most commonly endorsed reasons for resuming cannabis use following the most difficult prior quit attempt were “to relax” (78.7%), “to sleep better” (70.0%), “because I was craving cannabis” (69.5%), and “I missed feeling ‘high’” (69.5%). Treatment seekers were more likely to report “to feel less depressed” ($\chi^2(1, n = 197) = 6.20, p = .013$) and “to sleep better” ($\chi^2(1, n = 197) = 4.34, p = .037$) as reasons for relapse compared with non-treatment-seekers.

Discussion

The present study compared demographic and substance use characteristics of current cannabis users seeking treatment with those volunteering for non-treatment-based laboratory studies. Treatment seekers tended to be older, a finding that is not surprising given prior research showing associations between older age and treatment-seeking behavior (Mojtabai, Olfson, & Mechanic, 2002). Treatment seekers were also more likely to be female, but were still a minority relative to males in both groups. Prior research indicates that females are less likely to seek substance use treatment due to multiple access-related barriers (Green, 2006), so it is possible that this difference reflects a gender difference in

willingness to participate in residential research studies. Because the reported age of cannabis use initiation and age that frequent cannabis use began were similar across study groups, the outcome that treatment seekers had longer histories of use and frequent use compared with non-treatment-seekers likely reflects the age difference between the two groups.

With regard to experiences during prior quit attempts, treatment seekers were reportedly able to stay quit for a longer period of time than non-treatment-seekers before resuming cannabis use and reported making a quit attempt more recently than non-treatment-seekers. Treatment seekers reported experiencing a greater number of withdrawal symptoms during abstinence on average and endorsed a greater number of reasons for making a quit attempt. The former finding could indicate a greater degree of impairment during abstinence resulting in motivation to quit and entry into treatment-based studies, while the latter further points to an increased motivation to quit using cannabis.

Despite these differences, the two groups were similar in terms of several key characteristics. Treatment- and non-treatment-seekers reported comparably heavy levels of cannabis use, both in terms of the number of days used and daily use prior to their most difficult quit attempt, as well as in terms of the average number of blunts smoked by an individual at one time. Additionally, and perhaps most interestingly, no group differences were observed for endorsement of DSM-IV cannabis abuse and/or dependence, which indicates comparable levels of clinical impairment between the two groups. Utilization of formal treatment programs during prior quit attempts was low among both subgroups, indicating that most had tried to quit on their own. This is consistent with the

general lack of treatment engagement seen among substance users in the United States, but it is unclear whether this reflects a lack of treatment availability, a stigma associated with seeking treatment in general, or specifically for cannabis use, or a beliefs among this group that initially they would be successful quitting on their own.

There are strengths and limitations of this study that warrant acknowledgment. Strengths include: a) the use of identical recruitment strategies and assessments across studies, b) all research volunteers resided and presented for clinical and laboratory cannabis research participation in a single geographic location (greater Baltimore area), c) great degree of overlap with regards to study eligibility criteria, and d) this is the first direct and explicit comparison of cannabis using treatment- versus non-treatment-seeking research volunteers. Limitations of the study include: a) the reliance on retrospective self-report as the primary source of data regarding prior quit attempts, which are subject to recall bias, and b) cross-sectional approach.

Overall, this study provides a better understanding of the comparative characteristics of treatment- and non-treatment-seeking cannabis users than what was previously available. Similar to other examinations of treatment- versus non-treatment-seeking samples of substance users, both similarities and differences were observed. Treatment seekers reported significantly more withdrawal symptoms during abstinence, more reasons for attempting to quit, and utilized a greater number of coping strategies during their most difficult quit attempt, but substance use characteristics between groups were similar. These findings, taken together, potentially characterize treatment-seeking cannabis users as being more motivated to attempt to quit using cannabis than non-treatment-seeking participants, but having more difficulty doing so. Non-treatment-seekers, however, may also benefit from treatment, given that they were found to meet DSM-IV diagnostic criteria for abuse/dependence in comparably high proportions and also reported heavy cannabis use. Group differences based on motivation to quit are particularly noteworthy, given findings from Perkins and Lerman (2014) showing that, among cigarette smokers receiving a nicotine patch, varenicline, or bupropion in Phase 2 studies, treatment for smoking cessation was more effective among smokers who were already high in intrinsic quit motivation, even when given monetary rewards for initiating and maintaining abstinence. In the future, similar research among cannabis users is warranted to assess the importance of intrinsic motivation to quit among participants in research targeting novel treatment development for cannabis use disorders.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Boyd, S. J., Tashkin, D. P., Huestis, M. A., Heishman, S. J., Dermand, J. C., Simmons, M. S., & Gorelick, D. A. (2005). Strategies for quitting among non-treatment-seeking marijuana smokers. *The American Journal on Addictions*, 14, 35–42. doi:10.1080/1055049050899835
- Buchowski, M. S., Meade, N. N., Charboneau, E., Park, S., Dietrick, M. S., Cowan, R. L., & Martin, P. R. (2011). Aerobic exercise training reduces cannabis craving and use in non-treatment-seeking cannabis-dependent adults. *PLoS One*, 6(3), e17465. doi:10.1371/journal.pone.0017465
- Budney, A. J., Roffman, R., Stephens, R. S., & Walker, D. (2007). Marijuana dependence and its treatment. *Addiction Science & Clinical Practice*, 4, 4–16. doi:10.1151/ASCP07414
- Carroll, K. M., & Rounsaville, B. J. (1992). Contrast of treatment-seeking and untreated cocaine abusers. *Archives of General Psychiatry*, 49, 464–471. doi:10.1001/archpsyc.1992.01820060044007
- Copeland, J., Swift, W., & Rees, V. (2001). Clinical profile of participants in a brief intervention program for cannabis use disorder. *Journal of Substance Abuse Treatment*, 20, 45–52. doi:10.1016/S0740-5472(00)00148-3
- Copersino, M. L., Boyd, S. J., Tashkin, D. P., Huestis, M. A., Heishman, S. J., Dermand, J. C., . . . Gorelick, D. A. (2006a). Cannabis withdrawal among non-treatment-seeking adult cannabis users. *The American Journal on Addictions*, 15, 8–14. doi:10.1080/10550490500418997
- Copersino, M. L., Boyd, S. J., Tashkin, D. P., Huestis, M. A., Heishman, S. J., Dermand, J. C., . . . Gorelick, D. A. (2006b). Quitting among non-treatment-seeking marijuana users: Reasons and changes in other substance use. *The American Journal on Addictions*, 15, 297–302. doi:10.1080/10550490600754341
- Davis, M. L., Powers, M. B., Handelsman, P., Medina, J. L., Zvolensky, M., & Smits, J. A. J. (2014). Behavioral therapies for treatment-seeking cannabis users: A meta-analysis of randomized controlled trials. *Evaluation & the Health Professions*. Advance online publication. doi:10.1177/0163278714529970
- EMCDDA. (2008). *A cannabis reader: Global issues and local experiences* (Monograph series 8, Vol. 2). Lisbon, Portugal: European Monitoring Centre for Drugs and Drug Addiction.
- Green, C. A. (2006). Gender and use of substance abuse treatment services. *Alcohol Research & Health*, 29, 55–62.
- Levin, K. H., Copersino, M. L., Heishman, S. J., Liu, F., Kelly, D. L., Boggs, D. L., & Gorelick, D. A. (2010). Cannabis withdrawal symptoms in non-treatment-seeking adult cannabis smokers. *Drug and Alcohol Dependence*, 111, 120–127. doi:10.1016/j.drugalcdep.2010.04.010
- Meier, M. H., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R. S. E., . . . Moffitt, T. E. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences of the United States of America*, 109, E2657–E2664. doi:10.1073/pnas.1206820109
- Mojtabai, R., Olfson, M., & Mechanic, D. (2002). Perceived need and help-seeking in adults with mood, anxiety, or substance use disorders. *Archives of General Psychiatry*, 59, 77–84. doi:10.1001/archpsyc.59.1.77
- National Cannabis Prevention and Information Centre. (2012). *Treatment for cannabis use problems*. Retrieved from <http://ncpic.org.au/ncpic/publications/factsheets/pdf/treatment-for-cannabis-use-problems>
- Perkins, K. A., & Lerman, C. (2014). An efficient early phase 2 procedure to screen medications for efficacy in smoking cessation. *Psychopharmacology*, 231, 1–11.
- Rounsaville, B. J., & Kleber, H. D. (1985). Untreated opiate addicts: How do they differ from those seeking treatment? *Archives of General Psychiatry*, 42, 1072–1077. doi:10.1001/archpsyc.1985.01790340050008
- Smith, I. E., Dent, D. Z., Coles, C. D., & Falek, A. (1992). A comparison study of treated and untreated pregnant and postpartum cocaine-abusing women. *Journal of Substance Abuse Treatment*, 9, 343–348. doi:10.1016/0740-5472(92)90029-N
- StataCorp. (2013). *Stata statistical software: Release 13* [Software]. College Station, TX: StataCorp LP.
- Stein, M. D., Hagerty, C. E., Herman, D. S., Phipps, M. G., & Anderson, B. J. (2011). A brief marijuana intervention for non-treatment-seeking young adult women. *Journal of Substance Abuse Treatment*, 40, 189–198. doi:10.1016/j.jsat.2010.11.001
- Stephens, R. S., Babor, T. F., Kadden, R., Miller, M., & The Marijuana Treatment Project Research Group. (2002). The Marijuana Treatment Project: Rationale, design, and participant characteristics. *Addiction*, 97(Suppl 1)109–124. <http://dx.doi.org/10.1046/j.1360-0443.97.s01.6.x>

- Stephens, R. S., Roffman, R. A., & Simpson, E. E. (1993). Adult marijuana users seeking treatment. *Journal of Consulting and Clinical Psychology, 61*, 1100–1104. doi:10.1037/0022-006X.61.6.1100
- Strike, C. J., Urbanoski, K. A., & Rush, B. R. (2003). Who seeks treatment for cannabis-related problems? *Canadian Journal of Public Health, 94*, 351–354.
- Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (2010). *Treatment Episode Data Set (TEDS): 1998–2008. State Admissions to Substance Abuse Treatment Services* (DASIS Series: S-55, HHS Publication No. (SMA) 10–4613), Rockville, MD: SAMHSA.
- UNODC. (2012). *World drug report 2012* (United Nations publication, Sales No. E. 12. XI. 1). Retrieved from https://www.unodc.org/documents/data-and-analysis/WDR2012/WDR_2012_web_small.pdf
- Vandrey, R., Smith, M. T., McCann, U. D., Budney, A. J., & Curran, E. M. (2011). Sleep disturbance and the effects of extended-release zolpidem during cannabis withdrawal. *Drug and Alcohol Dependence, 117*, 38–44. doi:10.1016/j.drugalcdep.2011.01.003
- Vandrey, R., Stitzer, M. L., Mintzer, M. Z., Huestis, M. A., Murray, J. A., & Lee, D. (2013). The dose effects of short-term dronabinol (oral THC) maintenance in daily cannabis users. *Drug and Alcohol Dependence, 128*, 64–70.
- World Health Organization. (2014). *Cannabis*. Retrieved from http://www.who.int/substance_abuse/facts/cannabis/en/

Received May 28, 2014

Revision received July 24, 2014

Accepted July 28, 2014 ■

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