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Motivations to quit cannabis use in an adult non-treatment sample: Are they related to relapse?

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Abstract

Background—The majority of cannabis smokers who quit do so without formal treatment, suggesting that motivations to quit are an important part of cessation process. However, little is known about how motivations relate to successful quitting.

Method—A convenience sample of 385 non-treatment-seeking adult cannabis smokers (58% male, age 16–64 years at start of quit attempt) who made a “serious” (self-defined) quit attempt without formal treatment while not in a controlled environment were administered the 176-item Marijuana Quit Questionnaire (MJQQ) to assess their motivations to quit and outcome of the quit attempt. Exploratory factor analysis was performed to identify significant motivational factors. Subgroup comparisons used t-tests and ANOVA. Cox proportional hazard regression and the General Linear Model were performed to evaluate the influence of motivational factors, gender, and age on relapse status at time of interview and risk of relapse over time, with time between quit attempt and interview as a covariate.

Results—Exploratory factor analysis identified 6 motivational factors with eigenvalues >1 which accounted for 58.4% of the total variance: self-image and self-control, health concerns, interpersonal relationship concerns, legal concerns, social acceptability concerns, and self-efficacy. Women were more likely than men to be motivated by self-image/self-control, health

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concerns, and social acceptability concerns. Older individuals were more likely to be motivated by health concerns. At the time of interview, 339 subjects had relapsed. Self-image and self-control, health concerns, interpersonal relationship concerns, and social acceptability concerns were associated with greater likelihood of abstinence at the study interview. Legal concerns and social acceptability concerns were associated with significantly lower hazard ratios (0.88, 0.83) for relapse during the abstinent period.

Conclusion—These findings show gender and age differences in motivations to quit cannabis smoking and that adult cannabis smokers have motivations to quite similar to those of adolescent cannabis smokers and of adults who quit alcohol and tobacco use without formal treatment. The findings suggest areas of focus to improve secondary prevention and psychosocial treatment efforts.

Keywords

cannabis; motivation to quit; cessation; relapse

1. Introduction

Cannabis is the most widely used illicit drug in the world, with an estimated 119–224 million users in 2009 (United Nations Office on Drugs and Crime, 2012). In 2010, an estimated 4.5 million Americans aged 12 years or older (1.8%) met diagnostic criteria for cannabis abuse or dependence in the past 12 months (SAMHSA, 2011), yet only 1 million people received formal treatment for a cannabis use disorder (SAMHSA, 2011). Other epidemiologic and longitudinal studies suggest that a majority of cannabis quit attempts occur without formal treatment (Cunningham, 1999; Cunningham, 2000; Price, Risk, & Spitznagel, 2001; Smart, 2007). In this context, motivation to quit cannabis use is a fundamental element for understanding cessation and reducing relapse.

Motivation can be defined as an internal mental state, including the “personal considerations, commitments, reasons and intentions that move individuals to perform certain behaviors” (DiClemente, Schlundt, & Gemmell, 2004). Motivation to quit drug use has been conceptualized as having two components: the intensity of the drug user’s desire to quit and the “why” and nature of the motivation (Curry, Grothaus, & McBride, 1997). Studies of natural or spontaneous recovery (i.e., without formal treatment) from problematic psychoactive substance use found that the primary motivations for recovery were related to family, health, finances, negative personal effect, significant others, social and legal issues, and religion (Carballo et al., 2007).

Common reasons or motivations to quit cannabis use in non-treatment samples include the negative impact of cannabis on the user’s health, social or self-image (Copersino et al., 2006; Ellingstad, Sobell, Sobell, Eickleberry, & Golden, 2006), health problems, to have more energy and motivation to accomplish things (Hughes, Peters, Callas, Budney, & Livingston, 2008), changing perspective on cannabis use (positive to negative), short-term change in situation or way of life (e.g., vacation, school examinations, visit to relatives, hospitalization) (Terry, Wright, & Cochrane, 2007), and social influence (Ellingstad et al., 2006).

Adults seeking treatment for cannabis use disorders reported similar motivations to those in non-treatment-seeking populations, such as health concerns and self-control (McBride, et al., 1994; Stephens, Roffman, & Simpson, 1993; Zvolensky, Bonn-Miller, Leyro, Johnson, & Bernstein, 2010).

Previous studies of non-treatment-seeking adults involved small sample sizes, primarily white participants, and/or used qualitative interview methodology that did not comprehensively assess motivational factors for quitting and their association with demographic characteristics and quit success rates. The purpose of this study was to evaluate motivations to quit cannabis use in a large mostly African-American sample of non-treatment-seeking adults who made a quit attempt and their association with demographic characteristics and success of the quit attempt. This study was exploratory and, therefore, did not include specific hypotheses.

2. Material and Methods

2.1 Participants

Participants were a convenience sample of 500 non-treatment-seeking cannabis smokers recruited in the Baltimore, MD metropolitan area by advertising (print, television, radio, internet), word-of-mouth, and referral from other agencies (Levin et al., 2010). Eligible subjects were 18 years or older, able to read English at an 8th grade level, and had made at least one attempt to stop all cannabis use without formal treatment while not in a controlled environment. Among the 500 participants, 469 provided usable data (2 did not complete the questionnaire, 14 had never made a quit attempt, and 15 quit in a controlled environment such as jail or hospital). Data utilized in this analysis come from the 385 participants (82.1% of the original sample) who were interviewed within five years of the start of their index quit attempt, to reduce the potential influence of recall problems.

All subjects were primary cannabis users with no other current major medical, psychiatric, or substance use disorder except nicotine dependence (based on telephone screening questions). They were predominantly men (58%), young adults (mean [SD] age 29.2 [9.3] years, median 25.5 years, range 16–64 years, at the start of their quit attempt), African-American (82%), and single (78%).

This study was approved by the Institutional Review Board of the National Institute of Drug Abuse (NIDA) Intramural Research Program (IRP). Participants gave written informed consent while not acutely intoxicated or in withdrawal (as assessed clinically by the interviewer in terms of alertness, orientation, speech, and motor coordination). All participants were paid for their study participation.

2.2 Data collection

The Marijuana Quit Questionnaire (MJQQ) is a 176-item, self-report questionnaire that collects information in three domains: sociodemographic characteristics, history of cannabis use (including any associated problems), and characteristics of the subjects' "most difficult" (self-defined) quit attempt outside a controlled environment. The index quit attempt is characterized in four areas: reasons for quitting marijuana and resuming use (Copersino et al., 2006), coping strategies used while quitting (Boyd et al., 2005), withdrawal symptoms experienced during quitting (Gorelick et al., 2012; Levin et al., 2010), and changes in other substance use (both licit and illicit) during the quit attempt (Copersino et al., 2006).

Twenty-six items encompassing reasons for quitting cannabis use were drawn from published studies of motives to quit cannabis use in treatment contexts (McBride et al., 1994; Stephens et al., 1993) and motives for tobacco cessation (Curry, Wagner, & Grothaus, 1990). Twenty-three items were used previously in a sample of 104 non-treatment-seeking adult cannabis smokers (Copersino et al., 2006b); three new items (11, 21, and 22 in Table 1) were added for this study. Participants rated each item on the degree to which it applied to their quit attempt (applicability score), using a 5-point Likert scale (0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely/very much).

Confidence in quitting success at the start of the quit attempt was rated on a five-point Likert scale (1=Not confident at all to 5= Extremely confident).

2.3 Statistical Analysis

Exploratory factor analysis was performed on the 26 reasons for quitting marijuana, using principal components analysis with varimax rotation of factors. Only factors with eigenvalues greater than 1.0 were retained; a solution was selected on the basis of the scree test. Items were assigned to factors if they loaded greater than 0.45 on that factor (Tabachnick & Fidell, 1996).

An applicability score for each factor was computed by averaging the applicability scores for all items that loaded on that factor (Downey, Rosengren, & Donovan, 2001; Stephens et al., 1993). Applicability scores for a factor (or an item) could range from 0 to 4. Internal consistency for each identified factor was assessed with Cronbach's coefficient α . As Cronbach's α depends on the number of items, we also used the mean inter-item correlation (MIC) to facilitate comparison between factors with different numbers of items. Inter-factor correlations and the association between factors and confidence in success were assessed with Pearson's r correlation coefficient. Bonferroni corrections were applied to control for Type I error.

Independent t -tests and χ^2 tests were conducted to determine differences between men and women and abstinent and relapsed subjects at the time of the study interview. Cohen's d was applied to assess t -test effect size: d of 0.20–0.50 is considered a small effect, 0.50–0.80 a medium effect, and above 0.80 a large effect (Cohen, 1988). Age-based comparisons used one-way ANOVA with Tukey HSD for post-hoc comparisons applied to three age groups (based on decade divisions that generated roughly comparable sample sizes): less than 21 years (29% of sample); ages 21–30 (39%); and over 30 years (32%). Survival analysis with multivariable Cox proportional hazard regression was used to assess the association of motivational factors with the risk of resumption of cannabis use (i.e., relapse) after the quit attempt (i.e., during the interval between start of the quit attempt and the study interview). Time between start of the quit attempt and the interview was included as a covariate in the Cox regressions.

Two-way interactions with abstinence status were evaluated with binary logistic regression. To minimize Type I error, we evaluated only the following interactions: age at start of quit attempt (age) and gender, age and each motivational factor, and gender and each motivational factor.

All statistical tests were conducted with SPSS version 20 (SPSS, Inc., Chicago, IL). Two-tailed p -values <0.05 were considered significant.

3. Results

3.1 Characteristics of index quit attempt

The start of the index quit attempt occurred a *mean* (*SD*) of 14.8 [16.2] months before the study interview (*median* 9.5 months, *range* 1–60 months). The *mean* (*SD*) duration of the index quit attempt was 5.6 months [9.6] (*median* 2 months, *range* 1 day to 5 years). Over the 6 months prior to the index quit attempt, 66% of participants were daily cannabis smokers and another 30.6% smoked at least weekly. They smoked a *mean* of 9.2 [10.9] (*range* <1 –120) joints per day (Gorelick et al., 2012).

3.2 Motivations to quit

The principal component analysis identified 6 factors (each comprising 2–6 items) with eigenvalues exceeding 1.0 that accounted for 58.4% of the total variance (Table 1), suggesting that this was a meaningful factor solution (Floyd & Widaman, 1995). Each factor reflected a distinct motivational concept: self-image and self-control, health concerns, interpersonal relationship concerns, legal concerns, social acceptability concerns, and self-efficacy (Table 1).

All factors were significantly correlated with each other-- Pearson's r ranged from 0.21 to 0.60 (Table 2). Only the self-efficacy factor was significantly correlated with confidence in quitting success ($r=0.19$, $p<.001$).

3.3 Motivation to quit and cannabis abstinence

At the time of study interview, 46 subjects were abstinent and 339 had relapsed. Abstinent subjects had significantly higher average applicability scores than did relapsed subjects on the motivational factors of self-image and self-control, health concerns, interpersonal relationship concerns, and social acceptability concerns (Table 3).

The motivational factors of legal concerns and social acceptability concerns were associated with significantly lower risk of relapse after the start of the quit attempt (Table 4). A shorter time between start of the index quit attempt and the study interview was also associated with significantly lower risk of relapse (Table 4).

3.4 Association of gender and age with motivations to quit and abstinence

Women had significantly higher mean applicability scores than men on the motivational factors of self-image/self-control, health concerns, and social acceptability concerns (Table 5). Among women, health concerns were associated with higher risk of relapse ($p=0.05$, $HR= 1.25$, $95\% CI 1.00–1.58$) after the start of the quit attempt and social acceptability concerns with a lower risk of relapse ($p=0.001$, $HR= 0.66$, $95\% CI 0.52–0.84$). Among both women and men, time between start of the quit attempt and the interview ($p=0.01$, $HR= 0.74$, $95\% CI 0.63–0.88$; and $p<0.001$, $HR= 0.73$, $95\% CI 0.64–0.82$, respectively) and legal concerns ($p=0.032$, $HR= 0.82$, $95\% CI 0.68–0.98$; and $p=0.04$, $HR= 0.86$, $95\% CI 0.75–0.99$, respectively) were associated with lower risk of relapse. There was no significant gender difference in abstinence status at the study interview (13.8% of women and 10.7% of men abstinent, $p = 0.36$).

Age was positively associated with applicability score for health concerns ($F=4.360$, $p=0.01$), but not for the other 5 motivational factors. Subjects over 30 years had higher applicability scores for health concerns than under 21 years ($p=0.02$) or 21–30 years ($p=0.03$). Older subjects were somewhat more likely to be abstinent at the time of study interview ($r=-0.144$, $p=0.005$), but there was no association of age with risk of relapse during the quit attempt ($p=0.08$, $HR= 0.99$, $95\% CI 0.98–0.10$). After controlling for time between start of the quit attempt and the interview, among the youngest (< 21 years old) subjects, interpersonal relationship concerns were associated with higher risk of relapse ($p=0.02$, $HR= 1.32$, $95\% CI 1.04–1.67$). Among 21–30 year old subjects, legal concerns were associated with lower risk of relapse ($p=0.01$, $HR= 0.81$, $95\% CI 0.68–0.96$). No significant associations were found between any motivational factor and risk of relapse in the older subjects (> 30 years).

There were no significant two-way interactions between abstinence status at the study interview and age at start of the quit attempt (age) by gender, age by each motivational factor, or gender by each motivational factor (data not shown).

4. Discussion

This study found a 6-factor solution for motivations to quit cannabis use. These factors, especially health concerns, legal concerns, and interpersonal relationships concerns, are roughly comparable to the factors identified in several prior published studies of both treatment and non-treatment users of cannabis, alcohol, tobacco, and other drugs (Carballo et al., 2007; Curry et al., 1990; Curry et al., 1997; Ellingstad et al., 2006; McBride et al., 1994; McCaul et al., 2006; Sobell, Ellingstad, & Sobell, 2000). A study using an earlier version of the MJQQ (albeit with only 23 reasons for quitting items) in 104 adult, non-treatment-seeking cannabis smokers found a 4-factor solution with less clearly defined factors (Copersino et al., 2006). That study used only one item about legal concerns, versus 3 such items in the present study, which might account for its failure to identify a legal concerns motivational factor. That study and the present study also differed in subject sociodemographic characteristics: mean age 35 years vs. 29 years and majority (52%) white vs. majority (82%) African-American, respectively. Several motivational factors were significantly associated with abstinence status at the time of study interview, and two factors (legal concerns, social acceptability concerns) were associated with decreased risk of relapse between the start of the quit attempt and the study interview. Previous studies found inconsistent associations between motivations to quit and abstinence or relapse, depending on the substance. Extrinsic motivations (e.g., social influence or interpersonal relationships, or legal concerns) were associated with reduced success in tobacco and other drug (not identified) cessation (Curry et al., 1990; Downey et al., 2001), but were not associated with successful cessation of cannabis use (McBride et al., 1994).

There were significant gender and age differences in motivations to quit and their association with success of the quit attempt, but no significant two-way interactions among age, gender, and motivational factors. Women were more likely than men to be motivated by self-image/self-control, health concerns, and social acceptability concerns. These results are similar to the single study identifying gender differences in motives to quit cannabis among adolescents in school (49% male) (Terry-McElrath, et al., 2008). However, no gender differences were found in a predominantly (76%) male sample of adult treatment-seeking cannabis users, the majority of whom were current users of other legal and illegal drugs, except opiates (Stephens, et al., 1993). We found a complex relationship among age, motivational factors, and success of the quit attempt, with factor applicability and association with success varying by age group.

We are not aware of any studies evaluating the association of age with motivational factors to quit cannabis. Among tobacco users, health concerns as a motivation for quitting declined with increasing age (Curry et al., 1997), opposite to the finding with cannabis smokers in the present study. This difference could be due to the different legal status of the two substances or to differences in the age groups studied. Curry et al. (1997) studied an older group (mean age 41.1 years [SD=11.15]) with older age cut-offs (<35, 35–55, >55). A review emphasized that health concerns were the main motivation to quit tobacco among all age groups (McCaul, et al., 2006). Treatment-seeking adolescents reported different motivations for quitting cannabis than adults. Among adolescents, common reasons to quit were to avoid legal trouble, obtain a job or prevent vocational problems, avoid problems at home, and drug testing (Weiner, Sussman, McCuller, & Lichtman, 1999); adolescent females were more likely to focus on moral and behavior concerns than males (Terry-McElrath, O'Malley P, & Johnston, 2008).

In our sample, 43% of subjects gave drug testing in the workplace as a motivation to quit cannabis use, greater than the 28% of subjects endorsing this motivation in the prior MJQQ study (Copersino et al., 2006b). However, this item was not identified as a factor in the

principal components analysis, nor did it load on any of the 6 identified factors. Although not independently significant, workplace drug testing might stimulate reflection on other reasons to quit (e.g., health concerns, legal concerns, interpersonal influence).

This is one of few studies that evaluated the association between motivations for cannabis use cessation and the success of the quit attempt in an adult, non-treatment seeking sample that included large numbers of African-Americans, which allowed subgroup analyses by gender and age. However, this study had several limitations. Data were obtained by retrospective self-report without external corroboration, although studies suggest that non-treatment cannabis users give reliable retrospective self report about their cannabis use history (Ensminger, Juon, & Green, 2007; Fendrich & Mackesy-Amiti, 1995). There was substantial variation in the time interval between start of the quit attempt and the study interval and this variable itself was negatively associated with a significantly lower risk of relapse. However, it was included as a covariate in the multivariable analyses, thus statistically controlling for potential confounding of the associations between abstinence/relapse and motivational factors and demographic characteristics. The MJQQ has not been formally validated, but has been used successfully in studies of cannabis smokers with schizophrenia (Boggs et al., 2013) and without psychiatric co-morbidity (Levin et al., 2010). External validity of the study is unclear, as subjects were a convenience sample of cannabis users from one city in one country and predominantly African-American.

5. Conclusion

This study identified 6 motivational factors associated with quitting cannabis without formal treatment. Four of these factors (self-image/self-control, health concerns, legal concerns, and social relationship concerns) were significantly associated with successful quitting. There were differences in motivational factors and their association with quitting success based on gender and age. These findings have implications for secondary prevention and treatment of cannabis abuse. Emphasis on self-efficacy, self-esteem, or health costs and benefits might improve effectiveness of prevention programs. Focusing cessation interventions on enhancement of specific motivational factors, taking into account differences in gender and age, might improve outcome, as suggested by two meta-analyses (Hettinga, Steele, & Miller, 2005; Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Future prospective studies are needed in both treatment and non-treatment samples that evaluate a large variety of motivational factors and that include adequate samples of African-American and other minority groups in order to explore and better understand the link between motivations to quit cannabis use and outcome of the quit attempt.

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Highlights

- We examined factors motivating adults to quit cannabis smoking without treatment
- 6 motivational factors were identified, accounting for 58.4% of total variance
- Motivational factors varied by age and gender
- Self-image and self-control, health concerns, interpersonal relationship concerns, and social acceptability concerns were positively associated with success of the quit attempt

Table 1
Principal Components Analysis of Reasons for Quitting Cannabis Use Among 385 Adult, Non-Treatment Seeking Cannabis Smokers.

Factor	Reason for quitting	Eigenvalue	% Variance explained	Loading	% (n) endorsing two items in component	% (n) reporting	Cronbach α	MIC
Self-image and self-control	2. I would like myself better if I quit	7.63	14.34	0.526	91 (350)	59(226)	0.83	0.41
	4. I could feel in control of my life			0.672		66 (255)		
	7. Using marijuana did not fit who I want to be			0.574		6 (239)		
	13. To get more things done during the day			0.683		62 (240)		
	15. To save money			0.634		8 (323)		
	23. To not be a bad example for children			0.556		70 (269)		
Health concerns	24. To have more energy			0.663		73 (280)		
	10. Concern about having health problems	2.06	12.22	0.817	56 (215)	58 (222)	0.83	0.50
	11. Concern about suffering from a serious illness			0.829		42 (160)		
	14. Noticed symptoms that marijuana was hurting my health			0.698		45 (175)		
Interpersonal relationship concerns	18. Knew other people with health problems from marijuana			0.564		21 (79)		
	19. Be worried that marijuana would shorten life			0.724		39 (152)		
	5. Close people would stop nagging at me	1.77	9.25	0.656	49 (187)	54 (209)	0.72	0.39
	6. To get praise from people I am close to			0.637		37 (143)		
	9. Someone gave an ultimatum			0.599		21 (79)		
	12. Close people would be upset with me			0.752		50 (191)		
Legal concerns	20. Because of legal problems	1.55	8.23	0.787	35 (173)	33 (128)	0.75	0.51
	21. To avoid a conviction or jail sentence			0.824		3 (131)		
Social acceptability concerns	22. To avoid involvement to criminal activities			0.691		42 (162)		
	3. To don't have to leave social events	1.13	8.23	0.471	46 (173)	30 (115)	0.73	0.40
	8. Using marijuana is becoming less socially acceptable			0.588		38 (145)		
	25. Hair and clothes wouldn't smell like marijuana			0.577		47 (182)		
	26. To not burn holes in clothes and furniture			0.653		33 (127)		

Factor	Reason for quitting	Eigenvalue	% Variance explained	Loading	% (n) endorsing two items in component	% (n) reporting	Cronbach α	MIC
Self-efficacy	1. To show myself that I could quit	1.05	6.09	0.814	71 (273)	91 (350)	0.64	0.49
	16. To prove to myself that I was not addicted			0.770		72 (279)		

MIC = Mean Inter-item Correlation

Correlations between 6 Motivational Factors Derived from 26 Reasons for Quitting Cannabis Use Among 385 Adult, Non-Treatment-Seeking Cannabis Smokers

Table 2

	1	2	3	4	5	6
1. Self-image/self-control	1					
2. Health concern	.507*	1				
3. Interpersonal relationship concern	.459*	.348*	1			
4. Legal concerns	.285*	.236*	.364*	1		
5. Social acceptability concerns	.633*	.447*	.519*	.342*	1	
6. Self efficacy	.434*	.286*	.210*	.218*	.357*	1

* Pearson's *r* correlation significant at the 0.01 level.

Association between Motivational Factors for Quitting Cannabis Use and Abstinence or Relapse Status at the Time of Study Interview in 385 Adult, Non-Treatment-Seeking Cannabis Users

Table 3

Motivational factor ^d	Mean Applicability Score ^b		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	Abstinent n = 46 (12%)	Relapsed n = 339 (88%)			
Self-image/self-control	2.45	1.89	3.191	0.002	0.501
Health concern	1.42	0.92	2.990	0.003	0.470
Interpersonal relationship concern	1.30	0.89	2.691	0.007	0.423
Legal concerns	1.09	0.96	0.645	0.519	0.101
Social acceptability concerns	1.26	0.81	2.95	0.003	0.463
Self-efficacy	2.27	2.21	0.333	0.739	0.052

^a 6 motivational factors generated by principal components analysis of 22 items related to reasons for quitting cannabis use

^b Mean of the applicability scores (0–4 Likert scale) for all items that loaded on the factor. Applicability score reflects participant's judgment of the degree to which that item applied to the participant's quit attempt.

Table 4

Association between Motivational Factors for Quitting Cannabis Use and Risk of Relapse after Start of the Quit Attempt among 385 Adult, Non-Treatment-Seeking Cannabis Smokers

	<i>B</i>	<i>SE</i>	<i>p</i>	HR	95.0% CI for HR	
					Lower	Upper
Time between start of quit attempt and interview	-0.307	0.050	<0.001	0.736	0.667	0.812
Self-image/self-control	-0.012	0.069	0.858	0.988	0.862	1.132
Health concern	0.051	0.063	0.421	1.052	0.929	1.191
Interpersonal relationship concern	0.110	0.070	0.117	1.116	0.973	1.281
Legal concerns	-0.126	0.054	0.021	0.882	0.793	0.981
Social acceptability concerns	-0.157	0.079	0.046	0.855	0.733	0.997
Self-efficacy	0.055	0.052	0.291	1.056	0.954	1.169

Cox proportional hazard regression analysis used to predict cannabis relapse, with time between start of quit attempt and interview as a covariate. HR = hazard ratio; CI = 95% confidence interval. *p* value <0.05 was used in this model.

Table 5

Association Between Motivational Factors for Quitting Cannabis Use and Gender in 385 Adult, Non-Treatment-Seeking Cannabis Users

Motivational factor ^d	Mean Applicability Score ^b		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	Male n=225 (58%)	Female n=160 (42%)			
Self-image/self-control	1.80	2.18	-3.360	0.001	0.347
Health concern	0.87	1.14	-2.412	0.016	0.249
Interpersonal relationship concern	0.92	0.95	-2.251	0.802	0.233
Legal concerns	1.03	0.91	0.943	0.346	0.098
Social acceptability concerns	0.77	0.99	-2.100	0.036	0.217
Self-efficacy	2.18	2.26	-0.598	0.550	0.062

^a 6 motivational factors generated by principal components analysis of 22 items related to reasons for quitting cannabis use

^b Mean of the applicability scores (0–4 Likert scale) for all items that loaded on the factor. Applicability score reflects participant's judgment of the degree to which that item applied to the participant's quit attempt.