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Demographic, Cannabis Use, and Depressive Correlates of Cannabis Use Consequences in Regular Cannabis Users

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Abstract

Background and Objectives: Regular cannabis users experience cannabis-related consequences across many domains of functioning. The present study examined demographic, cannabis use, and depressive correlates of cannabis consequences. We hypothesized that (1) earlier onset of use would predict greater psychological and functional consequences; and (2) women would endorse more psychological and withdrawal consequences.

Methods: Data were collected from an urban sample of 184 adults who reported regular cannabis use. Seventeen items from a cannabis consequence checklist were grouped into three domains: *Psychological Consequences*, *Cannabis Withdrawal*, and *Functional Consequences*. Three multiple regressions were performed to explore demographic and cannabis use correlates of each domain. Correlations between domains and depressive symptoms were assessed using Pearson's *r*.

Results: Greater endorsement on the *Psychological Conseqeunce* subgroup was predicted by female gender, lower educational attainment, and treatment-seeking history for cannabis abuse/dependence. Individuals with greater number of quit attempts or treatment-seeking history endorsed more items in the *Cannabis Withdrawal* domain. Although the model failed to reach significance for *Functional Consequences*, age at onset of regular and daily cannabis use were negatively associated with this domain. Correlational analyses demonstrated higher BDI-II scores were related to greater endorsement of *Psychological Consequence* and *Cannabis Withdrawal* items.

Discussion and Conclusions: Regular cannabis users report consequences of use which can be grouped into content-specific subgroups. Individual characteristics are differentially associated with these subgroups.

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

Scientific Significance: Understanding which individual characteristics are related to cannabis use sequelae could help identify those at risk for greater consequences, thus leading to improved assessment and treatment interventions.

Keywords

cannabis consequences; individual characteristics; gender

INTRODUCTION

Cannabis continues to be the most widely used illicit substance in the United States, with an estimated 44% of individuals aged 12 years and older reporting lifetime use, and an estimated 4 million Americans meeting DSM-5 criteria for Cannabis Use Disorder (CUD) in the past 12 months.[1,2] Regular cannabis use has been associated with poor academic outcomes, including skipping school, longer time to graduation, lower grade point average, and lower academic achievement.[3,4,5] Cognitive impairments, including difficulties with executive function, psychomotor speed, memory, learning, processing speed, and sustained attention also are associated with regular cannabis use, with some deficits continuing even after periods of abstinence.[6,7,8] Both cannabis use and its related consequences have been linked to certain physical health outcomes such as respiratory dysfunction as well as mental health problems, including anxiety and depression.[9,10,11]

Although the above-referenced studies have informed our understanding of consequences related to cannabis use, individuals who use cannabis are not a homogenous group. Many consequences noted above are associated with frequent cannabis use. In addition, with changes in cannabis policy, different forms of cannabis products are becoming more widely available. Researchers are just beginning to examine the effects of potency, dosing and consumption method in addition to quantity and frequency. We do know that not all cannabis users experience the same cannabis-related consequences, and very few studies have examined whether individual personality or substance use characteristics may be differentially associated with specific consequences of cannabis use, particularly among more frequent cannabis users. For example, age of onset of cannabis use is a strong predictor of cannabis use consequences. Earlier age of onset, particularly during adolescence, may be linked to potential long-term cognitive deficits, including poor executive functioning and decision making problems.[12,13,14] Additionally, greater depressive symptoms have been observed among individuals who initiated regular cannabis use earlier in life.[15] Evidence also suggests that women progress more quickly from use to regular use, and that regular female cannabis users have a greater number of comorbid conditions and greater intensity of withdrawal.[16,17] Investigating these differences further would allow for a more nuanced understanding of negative effects of regular cannabis exposure, and perhaps help identify those who may be at greater risk for these effects.

Interest in the negative socio-emotional and health effects of regular cannabis exposure has led to the development of questionnaires designed to assess cannabis-related consequences, primarily among adolescents and young adults (i.e., Marijuana Consequence Questionnaire (MACQ)[18]; Cannabis Problems Questionnaire (CPQ)[19]). Although several studies have

examined domains of consequences, and some have investigated relationships between individual characteristics and specific consequences, this study extended these previous findings and aimed to identify individual characteristics that might predict a greater number of cannabis-related consequences. These characteristics could be used to guide assessment and highlight potential targets for treatment by clinicians working with patients with CUD.

The purpose of the current study is explore demographic, cannabis use, and depressive correlates of cannabis consequences in a community sample of adult, regular cannabis users. The cannabis consequence checklist, a 27-item questionnaire administered as part of the Drug History and Use Questionnaire (DHUQ)[20] was designed to assess cannabis-related psychological, interpersonal, health, and withdrawal consequences. Based on literature reviewed above, we hypothesized that: (1) earlier onset of initial, regular, and daily cannabis use would predict more functional (e.g., impulsive/risk behaviors) and psychological (e.g., moodiness, irritability, and depression) problems; and, (2)women would report more psychological and cannabis withdrawal consequences. Because the literature is rather limited, no additional hypotheses were offered.

METHODS

Participants and Procedure

Cannabis users were recruited from the Detroit metropolitan area using flyers, newspaper advertisements, and word-of-mouth for six behavioral pharmacology studies conducted between 2005 and 2018. All studies were approved by the local Institutional Review Board. Participants first underwent an initial phone screening. Those with a history of serious mental illness (e.g., schizophrenia, bipolar disorder) or intellectual disability were excluded during the phone screening phase. Inclusion criteria required participants to be aged 21- to 45-years-old, report current regular cannabis use (≥ three times in the past week), and identify as nontreatment-seeking. Participants who met these criteria were interviewed in person after providing informed consent. The present study examined interview screening data from participants who met DSM- IV criteria for a lifetime history of either Cannabis Abuse or Dependence according to the Structured Diagnostic Interview Schedule for Axis-I Disorders-IV (SCID-IV).[21]

Measures

Cannabis Use Characteristics—Cannabis use characteristics were assessed using the DHUQ (available upon request). This measure is a standardized self-report instrument developed and used routinely in our laboratory that examines the following: use of substances (cannabis, alcohol, tobacco, sedatives, stimulants, opiates, cocaine, hallucinogens, club drugs, and inhalants), age of first use, age of onset of regular use (1–3x per week, depending on substance), and age of onset of daily use for each substance, as well as number of quit attempts. Frequency and quantity of cannabis use were also assessed but were not included in analyses due to regular use reported by all participants, along with difficulties in reliably standardizing quantity of cannabis consumption across participants.

Lifetime cannabis-related consequences were examined using a 22-item checklist, consisting of items similar to those asked about several other drugs of abuse on the DHUQ, including alcohol, cocaine, and heroin (Heroin Use Consequence scale: HUC).[22] Participants indicated whether they had ever experienced each consequence item due to their use of cannabis or other cannabis products (never [0] or ever [1]). In addition to the 22-item checklist, we incorporated five symptoms of cannabis withdrawal, and asked participants to indicate whether there was a change (i.e., increase, decrease, or no change) during periods of cannabis nonuse. These items were recoded to indicate whether a participant had never [0] or ever [1] experienced the symptom in the expected direction (e.g., increased irritability/moodiness, decreased appetite), and then were added to the checklist to reflect the inclusion of withdrawal symptoms in the DSM-5.[1] Thus, the final cannabis consequence checklist included 27 items. See Table 1 for items and endorsement rates.

Beck Depression Inventory- Second Edition—Participants completed the Beck Depression Inventory – Second Edition (BDI-II) to assess the presence and severity of current depressive symptoms.[23]

Data Analyses

SPSS Version 25 was used to conduct all analyses. Data were first screened to ensure assumptions were met for all proposed analyses, including normality, linearity, homoscedasticity, and the absence of multicollinearity. Due to the small percentage of extreme values (<5%), outliers were eliminated from analyses. Missing data were excluded via listwise deletion. Because of the large number of items included on the cannabis consequence checklist, items were initially grouped based on face-validity into three *a priori* consequence subgroups: psychological, cannabis withdrawal, and functional. Principal Component Analysis (PCA), fixed to a three component solution, was then conducted to verify the appropriateness of these groupings. The covariance matrix with Varimax rotation was analyzed. Items with factor loadings > 0.3 were retained.[24]

To address the aim of the study, three standard multiple linear regressions were performed between number of items endorsed on each consequence subgroup as dependent variables with (a) demographic variables (i.e., years of education, gender, race) and (b) cannabis use variables (i.e., age at onset of initial, regular and daily cannabis use, number of prior attempts to quit, treatment-seeking history) as independent variables. For significant bivariate correlates such as gender and race, nonparametric bivariate tests were used to examine differences in individual item endorsement. The regression models did not include depression (via BDI-II) as this measure of current depression violates the temporal precedence required of a predictor. Based on the literature, however, we felt that depression was an important variable to consider. We thus examined the relationship between depression with each consequence domain using Pearson's r correlation coefficients. The threshold for rejecting the null hypothesis was $p < 0.05$ for all significance testing.

RESULTS

Sample Demographics and Cannabis Use Characteristics

Analyses included data from 184 participants who reported regular cannabis use and had a lifetime history of Cannabis Abuse or Dependence as indicated by the SCID-IV.[21] Participants were 28.97 ± 6.31 years old with 12.79 ± 1.57 years of education. The majority of participants were African American (85.8%) males (61.4%). On average, participants used cannabis for the first time at 15.05 ± 3.19 years, endorsed regular use by 17.36 ± 3.74 years, and used daily at 18.71 ± 4.32 years. The number of reported quit attempts ranged from 0 to 10 (*Md:* 1.0), with 35.3% of our sample having never attempted to quit. Only 8.2% of the sample reported ever seeking treatment for cannabis use. Participants reported using cannabis 6.25 ± 5.28 times a day on average over the course of a week, and on 27.94 ± 5.62 days in the past month (see Table 2 for demographic and cannabis use characteristics).

Data Reduction of Cannabis Consequence Items

Three subgroups were created *a priori* based on the study's hypotheses. Items were grouped into one of the following consequence subgroups: 1) psychological (seven items: memory lapse/blackout, mood swings/irritability, couldn't stop, missed activities, difficulty concentrating, memory problems, fights/quarrels); 2) cannabis withdrawal (five items: changes in appetite, changes in sleep, irritability/moodiness, anxiety/agitation, and craving for cannabis during periods of cannabis nonuse); and, 3) functional (eleven items: unexpected reaction, arrested/legal problems, high at work, missed work, lost job, high at school, missed school, suspended/expelled, drove under the influence, financial problems, and family problems). Health related items (i.e., "health problems", "accident/injury", "visited Emergency Room", "shakes/tremors") were excluded due to extremely low item endorsement.

An exploratory PCA fit to a three-component solution identified six items which failed to load onto any component: unexpected reaction, missed work, lost job, suspended/expelled, financial problems, and family problems. The final PCA contained 17 consequence items (a = 0.79; eigenvalues > 1.0), which accounted for 42.4% of the total variance. Bartlett's tests of sphericity indicated the model was appropriate (χ^2 (136) = 652.90, $p < 0.001$), and the Kaiser-Meyer-Olkin measure of sampling adequacy was above the recommended value of 0.60 (KMO = 0.73).[25] Component 1, *Psychological Consequences*, accounted for 22.8% of the total variance while *Cannabis Withdrawal* (Component 2) and *Functional Consequences* (Component 3) accounted for 10.6% and 9.0% of the total variance, respectively (See Table 3). Thus, the data support the existence of three consequence subgroups.

Correlates of Consequence Components

Table 4 displays results for three multiple linear regressions, including unstandardized regression coefficients (B), the standardized regression coefficients (β) and R^2 for each model.

Psychological Consequences—A multiple linear regression was performed to predict psychological consequences from demographic (educational attainment, gender, race) and

cannabis use (onset of initial, regular and daily cannabis use, number of quit attempts, treatment-seeking history) variables. A significant regression equation was found ($F(8,161) = 3.08$, $p = .003$, $R^2 = 0.13$). Higher endorsement was significantly predicted by identifying as a woman ($\beta = 0.19$, $t = 2.53$, $p = .013$), lower educational attainment ($\beta = -0.20$, $t = -2.63$, $p = .009$), and a treatment-seeking history ($\beta = 0.17$, $t = 2.25$, $p = .026$). Follow-up analyses examined gender differences at the item-level within this five-item component. Significant differences were found for "mood swings/irritability" ($\chi^2(1, N=182) = 5.62$, $p = 0.025$) and "memory problems" ($\chi^2(1, N=184) = 6.04$, $p = .016$), with a larger proportion of women endorsing these items than men. Based on these findings, one prediction was supported, as women endorsed more items on this domain. However, onset of cannabis use did not significantly predict psychological consequences independently from other correlates in the model. In terms of depressive symptoms, BDI-II scores were positively correlated with total item endorsement on this domain (Pearson's $r = 0.26$, $p < .001$).

Cannabis Withdrawal—Results of this multiple linear regression indicated that, overall, the eight demographic and cannabis use correlates produced a significant model ($F(8,155) = 2.13$, $p = .036$, $R^2 = 0.10$). Individual correlates were examined, revealing that greater cannabis withdrawal endorsement was significantly predicted by more quit attempts ($\beta = 0.19$, $t = 2.38$, $p = .019$) and a treatment-seeking history ($\beta = 0.18$, $t = 2.31$, $p = .022$). The explicit hypothesis for this subgroup of consequences was not supported, as gender failed to significantly predict item endorsement. Depressive symptoms, indicated by higher BDI-II scores, were related to greater endorsement on this domain (Pearson's $r = 0.27$, $p < .001$).

Functional Consequences—This regression model failed to reach significance ($F(8,162) = 1.23$, $p = .282$, $R^2 = 0.06$). However, item endorsement on this subgroup of consequences was significantly associated with age at onset of regular ($r = -0.15$, $p = .025$) and daily ($r = -0.13$, $p = .046$) cannabis use. Although the hypothesis for this domain was partially supported by these results, there is indication that earlier initiation of frequent but not initial use is associated with greater functional consequences. This domain was not related to BDI-II score ($r < 0.01$, $p = .963$).

DISCUSSION

The present study sought to examine demographic, cannabis use, and depressive correlates of cannabis use characteristics and cannabis-related consequences. This is one of only a small number of studies which have examined whether individual characteristics might represent risk factors for experiencing certain types of cannabis-related consequences. Results indicate that regular cannabis users report consequences of use, that these consequences can be grouped into content-specific subgroups, and that certain individual characteristics differentially predict the number of consequences endorsed on these consequence subgroups.

Endorsing items from the *Psychological Consequences* subgroup was significantly predicted by lower education attainment and treatment-seeking history. Greater endorsement was also related to higher BDI-II scores. In addition, as hypothesized, gender (e.g., being a woman) significantly predicted a higher number of consequence items in this subgroup. Overall,

these findings are consistent with literature supporting an association between cannabis use and increased depression, as well as findings suggesting that female cannabis users are potentially more vulnerable to psychological consequences compared to males.[26,27] Here, a greater proportion of women endorsed moodiness/irritability than expected. Existing research suggests a possible response bias in self-reported depression whereby men, under certain contexts, underreport depressive symptoms compared to women.[28] It could be that this response bias also affected our sample's endorsement of psychological problems with women being more likely to acknowledge these difficulties. However, we did not observe concurrent gender differences on BDI-II scores ($p > .05$), suggesting this pattern of responses was not consistent across mood measures. Chronic exposure to cannabis has also been associated with cognitive impairments, which include memory difficulties.[29] The current study extended upon these findings by indicating that more women reported memory difficulties compared to men. Recent literature has suggested that targeting cognitive impairment during treatment for CUD might potentially improve treatment retention and outcomes.[30,31] Thus, results from the present study further reveal that this treatment focus might be especially valuable for women with co-morbid Major Depressive Disorder.

Endorsement of items on the *Cannabis Withdrawal* subgroup was predicted by previous treatment-seeking and a greater number of quit attempts. Further, greater item endorsement was related to higher scores on the BDI-II. These findings lend support to previous research that found depressive symptoms predicted more serious cannabis withdrawal.[32] The importance of withdrawal and depressive symptom monitoring during early phases of treatment for CUD is underscored by results from the present study. It is not surprising that experience of withdrawal is associated with treatment-seeking and number of quit attempts, as individuals who have made more attempts to stop using cannabis have had more opportunities to experience cannabis withdrawal. Put another way, individuals with greater withdrawal symptoms endorse more relapse vulnerability, consistent with previous findings.[33] Finally, in contrast with previous studies demonstrating that women endorse greater severity and impact of withdrawal symptoms,[17] gender differences were not observed in the *Cannabis Withdrawal* subgroup. The failure to find differences between men and women may be due to the fact that the checklist did not assess severity of withdrawal symptoms, only symptom count (i.e., item endorsement). Therefore, gender differences in *Cannabis Withdrawal* consequences might be moderated by other cannabis use characteristics, including frequency and quantity of cannabis use.

The *Functional Consequence* subgroup consisted of five items related to observable consequences of risk behaviors (e.g., academic, occupational, driving under the influence, arrests/legal problems). The overall regression model was not significant. In addition, all independent variables in the model were non-significant. We did find that participants with higher item endorsement on this domain were younger at initiation of regular and daily cannabis use. These preliminary findings suggest that those who scored high on this component may represent a particularly high-risk group, even among regular cannabis users, as use across multiple settings presents more opportunities to experience negative outcomes, such as the risk of accident or termination from work. Thus, items that comprise the *Functional Consequences* subgroup merit further consideration in future studies. For example, assessment of impulsivity, or forms of psychopathology characterized by risk-

taking (e.g., anti-social personality disorder, ADHD) may be important factors to consider in future studies to help understand this high-risk group.

Understanding individual characteristics that predict specific sequelae of cannabis use could lead to improvements in assessment and treatment interventions aimed at identifying and reducing cannabis-related consequences. The findings presented here also underscore the importance of assessing for depressive symptoms in patients presenting with symptoms of CUD, as such individuals may be more likely to experience certain cannabis-related consequences. For example, clinicians treating patients with co-morbid symptoms of depression and CUD may also want to explore the extent to which the patient is experiencing withdrawal consequences, and whether the patient perceives these consequences as maintaining their cannabis use or otherwise impacting their well-being.

The findings also have important implications for prevention of risky cannabis use. Given the trend toward legalizing cannabis throughout the United States, it is increasingly important to identify characteristics that might make an individual particularly vulnerable to experiencing cannabis-related consequences, as prevention groups may want to tailor messages to better reach specific groups. In particular, the findings highlight the importance of prevention or treatment of early-onset cannabis use, specifically aimed at preventing the progression to regular or daily cannabis use. Here, we found that earlier onset both of regular and daily cannabis use were associated with more risky and impulsive behaviors, such as driving while high, whereas onset of initial use was not. Prevention efforts could incorporate more tools to inhibit the progression from initial or occasional use to regular use.

Results of the current study must be viewed within the context of several limitations. First, psychometric properties of the DHUQ have just begun to be examined empirically. While this measure is commonly used in our research to acquire data on drug-related consequences experienced by our participants, we are not encouraging its use in clinical settings. Another limitation includes the cross-sectional nature of the data, and the accuracy associated with reporting retrospective problems (e.g., “high at school”, when participants may not be currently enrolled in school). Cannabis withdrawal items may be especially susceptible to inaccuracies in retrospective reporting, as participants were not asked to recall the most recent withdrawal episode and likely were not in acute withdrawal when answering the questionnaire. Further, data were collected over a wide timespan, which has corresponded with a shift in overall perceptions of cannabis use and consequences. It is possible that more recent particpants underreported consequences as compared to earlier participants as they might view cannabis use as less risky. In addition, because consequence items were obtained from a larger questionnaire of multiple drug classes and related sequelae, it is likely that there are additional relevant cannabis-related items that were not included. The possible bi-directional nature of these associations further supports the need for more longitudinal methodology to evaluate potential causal relationships and trajectories over time. For example, women reported greater psychological consequence endorsement, with increased mood and memory difficulties compared to men. But, it could also be that the experience of these psychological consequences might predict greater depressive symptomatology. Despite recruiting a non-treatment sample, the entire sample reported using cannabis regularly,

averaging 6.60 ± 1.34 days of use in the past seven days. Results from a high use sample with a restricted range may not generalize to less frequent smokers.

Despite these limitations, the findings presented here extend previous research on consequences of chronic cannabis use by demonstrating that individual factors such as age at onset of regular cannabis use, gender, and self-reported depressive symptoms were identified as correlates of cannabis-related consequences in a sample of regular cannabis-users. Viewed within the context of existing literature, the current findings underscore the importance of early intervention in CUD treatment, and also suggest that addressing depression and cognitive issues during treatment may be helpful for reducing psychological consequences of chronic cannabis exposure, particularly for women. It also is possible that the relationship between depressive symptoms and cannabis consequences is influenced by gender, particularly for memory difficulties and moodiness/irritability. Additional studies are needed to examine gender differences in trajectories of co-morbid depression and CUDs, comparing age of onset and developmental timelines for each. Future studies should also evaluate whether cannabis use consequences serve to mediate or moderate relationships among demographic, cannabis use, and other psychological characteristics, extending prior work with other illicit substances.[34,35]

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TABLE 1.

Participant item endorsement on the 27-item cannabis consequence checklist

Consequence items	Sample endorsement *n* (%)
Increased cannabis cravings during periods without (41)	109 (62.3 %)
Memory problems (27)	93 (50.5 %)
Increased irritability/moodiness during periods without (39)	91 (52.0 %)
Drove under influence (23)	87 (47.5 %)
Decreased appetite during periods without (37)	79 (45.1 %)
High at school (19)	67 (36.4 %)
Mood swings or irritability (10)	63 (34.6 %)
Difficulty concentrating (26)	59 (32.2 %)
High at work (16)	59 (32.1 %)
Decreased sleep during periods without (38)	58 (33.1 %)
Increased anxiety/agitation during periods without (40)	56 (32.2 %)
Couldn't stop (11)	52 (28.4 %)
Memory lapse/blackout (8)	46 (25.3 %)
Missed activities (12)	42 (23.0 %)
Financial problems (25)	35 (19.0 %)
Unexpected reaction (7)	34 (18.6 %)
Arrested/legal problems (13)	30 (16.3 %)
Missed school (20)	28 (15.4 %)
Fight or quarrel (22)	16 (8.7 %)
Family problems (24)	15 (8.2 %)
Missed work (17)	10 (5.4 %)
Lost job (18)	10 (5.4 %)
Suspended/expelled (21)	7 (3.8 %)
Shakes/tremors (9)	5 (2.7 %)
Visited Emergency Room (28)	3 (1.6 %)
Accident/injury (14)	2 (1.1 %)
Health problems (15)	1 (0.5 %)

Note. Item number on the DHUQ is indicated in parenthesis. *N*=184.

TABLE 2.

Sample demographic and cannabis use characteristics

Variable	*n* (%)	*M (Sd)*
Age		28.97 (6.31)
Education (years completed)		12.79 (1.57)
Race [a]		
African American	157 (85.8)	
Caucasian	20 (10.9)	
Other	6 (3.3)	
Gender		
Men	113 (61.4)	
Women	71 (38.6)	
Age (of cannabis onset)		
Initial		15.05 (3.19)
Regular (3x per week)		17.36 (3.74)
Daily		18.71 (4.32)
Number of quit attempts [b]		1.00 (2.05)
Never attempted	65 (35.3)	
Ever sought treatment	15 (8.2)	
Average uses per day (past week)		6.24 (5.28)
Use days in past month		27.94 (5.62)

Note. N=184.

[a] *N*=183.

[b] Median is reported

TABLE 3.

Rotated component matrix from Principal Components Analysis of 17 cannabis consequences

Item	Component 1	Component 2	Component 3
Memory lapse/blackout	**0.697**		
Mood swings/irritability	**0.587**	0.322	
Couldn't stop	**0.400**	0.342	
Missed activities	**0.451**		
Difficulty concentrating	**0.732**		
Memory problems	**0.772**		
Fight/quarrel	**0.347**		
Decreased appetite during periods w/o		**0.426**	
Decreased sleep during periods w/o		**0.512**	
Increased irritability/moodiness during periods w/o		**0.802**	
Increased anxiety/agitation during periods w/o		**0.678**	
Increased cannabis cravings during periods w/o		**0.622**	
Arrested/legal problems			**0.310**
High at work			**0.769**
High at school			**0.815**
Missed school			**0.476**
Drove under the influence			**0.621**

Note. Items with loadings > 0.30 were retained and shown in this table. Items loaded onto multiple components were assigned to a component based on highest loading value.

Component 1: *Psychological Consequences*

Component 2: *Cannabis Withdrawal*

Component 3: *Functional Consequences*

TABLE 4.

Standard multiple regressions of demographic and cannabis use variables on consequence endorsement

Variable	*R*	R^2	*F*	*B*	*β*	*t*
Psychological (DV)	0.37	0.13	3.08*			
Gender				0.74	0.19	2.53*
Race				0.28	0.07	0.94
Education (years)				−0.24	−0.20	−2.63*
Initiation onset				0.07	0.12	1.08
Regular onset				−0.09	−0.18	−1.03
Daily onset				0.05	0.11	0.77
Quit Attempts				0.10	0.11	1.44
Treatment history				1.22	0.17	2.25*
Withdrawal (DV)	0.32	0.10	2.13*			
Gender				0.22	0.07	0.84
Race				−0.05	−0.02	−0.19
Education (years)				0.08	0.08	0.05
Initiation onset				0.01	0.03	0.22
Regular onset				−0.07	−0.16	−0.85
Daily onset				0.02	0.05	0.34
Quit attempts				0.15	0.19	2.38*
Treatment history				1.07	0.18	2.31*
Functional (DV)	0.24	0.06	1.23			

Note. p<0.05 denoted with an asterisk.

Only independent variables from significant models are displayed.