



Cannabis use during a voluntary quit attempt: An analysis from ecological momentary assessment



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ABSTRACT

Background: There is little research that has sought to identify factors related to quit success and failure among cannabis users. The current study examined affective, cognitive, and situational factors related to cannabis use among current cannabis users undergoing a voluntary, self-guided quit attempt.

Method: The sample consisted of 30 (33% female) current cannabis users, 84% of whom evinced a current cannabis use disorder. Ecological momentary assessment was used to collect multiple daily ratings of cannabis withdrawal, negative affect, peer cannabis use, reasons for use, and successful coping strategies over two weeks.

Results: Findings from generalized linear models indicated that cannabis withdrawal and positive and negative affect were significantly higher during cannabis use than non-use episodes. Additionally, when negative and positive affect were entered simultaneously, negative affect, but not positive affect, remained significantly related to use. Participants were significantly more likely to use in social situations than when alone. When participants were in social situations, they were significantly more likely to use if others were using. Participants tended to use more behavioral than cognitive strategies to abstain from cannabis. The most common reason for use was to cope with negative affect.

Conclusions: Overall, these novel findings indicate that cannabis withdrawal, affect (especially negative affect), and peer use play important roles in cannabis use among self-quitters.

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1. Introduction

Most persons using, abusing, or dependent on cannabis attempt to quit on their own (Copersino et al., 2006). Self-quit is defined as attempts to quit without professional assistance (i.e., enrolling in formal treatment; Copersino et al., 2006). Cannabis self-quit rates are similar to those observed for other substances (e.g., tobacco; Hughes et al., 1996). In fact, by young adulthood, many individuals have made multiple cannabis self-quit attempts. For example, by age 30, weekly cannabis users report 3–7 self-quit attempts (e.g., Copersino et al., 2006; Stephens et al., 1993). Among those undergoing a self-quit attempt, nearly 80% were unable to refrain from cannabis use on over 50% of the days they attempted to abstain (Hughes et al., 2008). Thus, a large proportion of cannabis users is interested in and pursues quitting on their own. Yet, there remains little empirical knowledge about the mechanisms underlying success or failure in quit attempts among self-quitters.

Psychotherapy for cannabis often teaches patients skills to manage 'high risk' situations (e.g., Steinberg et al., 2002), including those involving cannabis withdrawal, affect, and peer pressure.

Some data indicate these situations are, in fact, related to poorer outcomes. Withdrawal is related to rapid relapse to cannabis dependence among those in cannabis use disorder (CUD) treatment (Cornelius et al., 2008). Negative affect also has been linked to poorer CUD treatment outcomes (e.g., Buckner and Carroll, 2010; White et al., 2004). People report that they often use cannabis in social situations (Buckner et al., 2012a; Reilly et al., 1998) and having more friends who use or approve of cannabis appears to maintain cannabis use (Sussman and Dent, 2004). In fact, in a qualitative interview following quit attempts, participants reported situations involving negative affect and exposure to others smoking cannabis were among the most difficult situations in which to abstain (Hughes et al., 2008). Together, available data suggest that cannabis withdrawal, negative affect, and being in the company of cannabis users may increase the probability of quit failure.

Although research has provided insight into affective and situational correlates of cessation failures, we know little about the proximal correlates of cessation failures due to methodological limitations of extant research. Although several studies (Chen and Kandel, 1998; Hammer and Vaglum, 1990; Kandel and Raveis, 1989) have identified sociodemographic (e.g., age, gender) or lifestyle (e.g., number of substance-using friends) factors related to cannabis cessation, proximal predictors of cessation failures have not been explored. This limitation is unfortunate, as it is

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unclear whether any risk candidates for cannabis quit failure actually occur during cessation failures. Additionally, although negative affect appears related to cessation failures (e.g., [Chen and Kandel, 1998](#)), the time intervals in these studies are often several years, making it unclear whether momentary increases in negative affect are related to cessation failures. Finally, retrospective self-report data of reasons for use during cessation attempts may be subject to memory or recall bias, which could be particularly relevant to cannabis-using populations given evidence of memory problems among users ([Wadsworth et al., 2006](#)), particularly heavy users ([Pope and Yurgelun-Todd, 1996](#)).

The use of ecological momentary assessment (EMA) is one way to better address these limitations. EMA involves the use of daily monitoring of target behaviors. The benefits of EMA include ([Shiffman et al., 2008](#)): (1) data collection in real-world environments; (2) minimization of retrospective recall bias; and (3) aggregation of observations over multiple assessments to facilitate within-subject assessments of behaviors across time and context. We know of only one study using EMA to identify a positive relationship between cannabis craving and use among women receiving treatment for substance dependence ([Johnson et al., 2009](#)). Yet, it is unknown whether participants who used cannabis in that study were striving to quit cannabis given that only 34% of the sample were in treatment for cannabis dependence (i.e., some patients may have sought treatment for other substances with no plan to reduce or quit cannabis use).

It also remains unknown what strategies cannabis using individuals find useful to help them remain abstinent during self-quit attempts. High rates of relapse following cannabis treatment and self-quit attempts suggest the need to determine what coping strategies are useful during quit attempts. We are not aware of any studies that assess such strategies during a quit attempt while the individual is actually in the designated 'high-risk situation.' One investigation that employed retrospective methodology found that the most useful strategies included keeping busy and exercising ([Hughes et al., 2008](#)). It is likely that confirmation of whether such behavioral strategies are actually associated with maintaining abstinence during high-risk situation (e.g., when cannabis cravings are high) as well as identification of additional successful strategies could help inform and improve models of cannabis quitting and guide future treatment development efforts.

The current study sought to determine situational and affective correlates of cannabis use during a quit attempt. Specifically, current cannabis users undergoing a voluntary self-quit attempt were evaluated for two weeks using EMA to record correlates of cannabis use, reasons for use, and strategies employed to maintain abstinence. We first examined whether cannabis withdrawal and/or affect was related to cannabis use. It was predicted that greater cannabis withdrawal and negative (but not positive) affect would be related to use. Second, we examined reasons for cannabis use. Informed by prior work ([Hughes et al., 2008](#)), it was hypothesized that coping, conformity, and social motives would be reported during cannabis use episodes. Finally, we examined strategies associated with maintaining cannabis abstinence. In line with retrospective work ([Hughes et al., 2008](#)), it was hypothesized that behavioral strategies would be used during periods of elevated cannabis craving.

2. Method

2.1. Participants

Participants were recruited from August 2010 to October 2011 via community advertisements (e.g., flyers, Craigslist advertisements). The sample consisted of current (past-month) cannabis

users from the community who (1) endorsed a desire to quit cannabis; (2) expressed intention to quit cannabis on their own (i.e., without the assistance of therapy); (3) agreed to quit cannabis on the date of their first appointment; (4) endorsed cannabis as their drug of choice; and (5) were 18–65 years old. Individuals who were interested in participating first completed an online or telephone screening to assess these inclusion criteria. Of the 47 potential participants who scheduled an appointment, 9 cancelled or no showed. Of the 38 who attended a baseline appointment, 2 were excluded because they met criteria for current alcohol dependence, 1 due to history of delusions, and 1 due to history of hallucinations. Three participants dropped out of the study after baseline appointment and one was excluded due to non-compliance with EMA data collection (described below). [Fig. 1](#) presents a flowchart of study participants.

The final sample was comprised of 30 (33.3% female) individuals aged 18–50 years ($M=22.13$, $SD=5.96$). At baseline, participants reported using cannabis 19–90 ($M=66.00$, $SD=22.72$) days in the past 90 days. Mean age of first cannabis use was 15.17 ($SD=2.35$; range=11–19). The majority (80%) were college students and 20% were employed full-time and 40% employed part-time. The sample was predominantly non-Hispanic/Latino (83.3%) and the racial composition of the sample was: 86.7% Caucasian, 3.3% African American or Black, and 10.0% "mixed". Regarding prevalence of CUD, 3 (10.0%) met DSM-IV criteria for cannabis abuse and 22 (73.3%) met criteria for cannabis dependence. Per DSM-IV ([American Psychiatric Association, 1994](#)), respondents meeting criteria for both abuse and dependence were classified as dependence only. Criteria for a cannabis dependence diagnosis were consistent

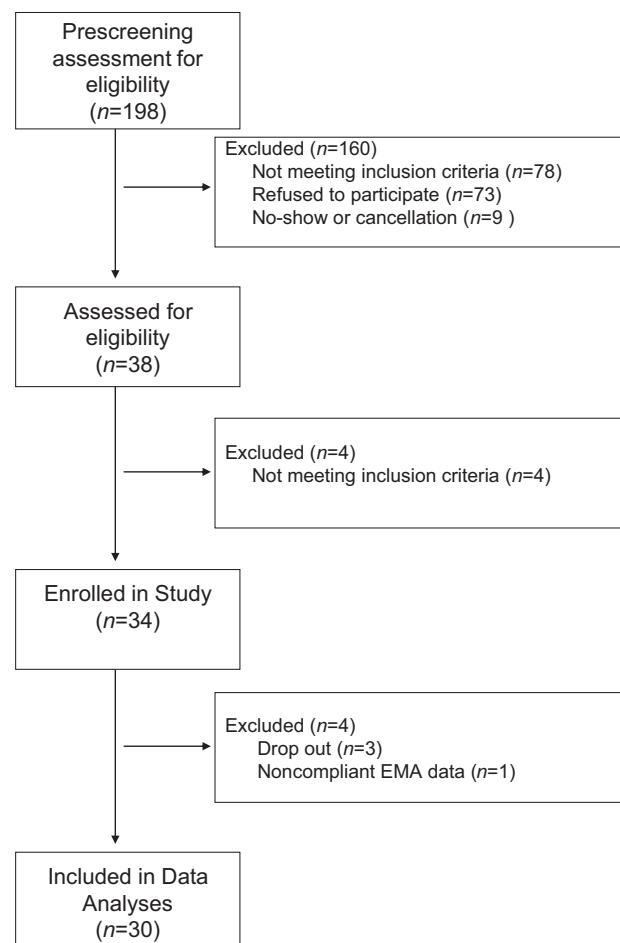


Fig. 1. Flowchart of study participants.

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