Momentary factors during marijuana use as predictors of lapse during attempted abstinence in young adults

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HIGHLIGHTS

- Nearly 3 in 4 young adults lapsed during attempted abstinence from marijuana.
- Marijuana accessibility and permissibility during use each predicted lapse.
- Permissibility during use plus baseline characteristics accurately classified lapse.

ARTICLE INFO

ABSTRACT

Introduction: Young adults using marijuana heavily often try multiple times to quit on their own. We sought to identify momentary experiences during marijuana use that could aid in predicting lapse when young adults subsequently attempt abstinence.

Methods: Young adults ($N = 34$) age 18–25 using marijuana ≥ 5 days/week and planning to quit completed a survey of sociodemographic characteristics, substance use, marijuana expectancies, use motives, perceived social support, and confidence to abstain. They completed ecological momentary assessment (EMA) smartphone reports several times/day for two weeks prior to, then during two weeks of attempted abstinence. Use period EMA reports assessed affect, craving, accessibility, situational permissibility, use, and motivation to abstain. Baseline survey and EMA data were examined in relation to subsequent lapse during attempted abstinence.

Results: Nearly 3 in 4 participants (73.5%) reported lapsing during attempted abstinence from marijuana. On bivariate analyses, lower baseline dependence severity score, negative effect expectancies, perceived family support, and confidence to abstain were each associated with lapse. Of the use period EMA variables, greater percent of days with marijuana use, reports of easy accessibility, and reports of situational permissibility were each associated with lapse. Modeled together, negative effect expectancies, perceived family support, confidence to abstain, and situational permissibility during use were highly accurate in predicting lapse during attempted abstinence.

Conclusions: Momentary factors may add to conventionally-surveyed characteristics to enhance prediction of lapse during attempted abstinence among young adults with heavy marijuana use.

Momentary assessment prior to a quit attempt may thus enable more effective personalized approaches to preventing lapse.

1. Introduction

Young adults age 18–25 have the highest rates of cannabis use disorder (CUD) (Degenhardt et al., 2013); approximately 1.8 million young adults (5.1%) had CUD in the past year (Center for Behavioral Health Statistics and Quality, 2016). Most young adults with CUD try to quit without formal treatment (Cunningham, 2000; Shrier, Rhoads, Burke, Walls, & Blood, 2014) and may attempt cessation multiple times

without sustaining abstinence (Copersino et al., 2010; Hughes, Naud, Budney, Fingar, & Callas, 2016). As a result, nearly one-half of young people with an index CUD episode do not achieve or sustain recovery during early adulthood (Farmer et al., 2015). Research is needed with young adults attempting to quit heavy marijuana use, for whom cessation is particularly important for mitigating negative social and health effects, persistence and recurrence of CUD, and progression to other substance use disorders (SUDs) in adulthood (Farmer et al., 2015;

Perkonigg et al., 2008; Weinberger, Platt, & Goodwin, 2016). Because few young adults with CUD receive treatment in a program (Substance Abuse and Mental Health Services Administration, 2017), it is critical to achieve greater understanding of factors associated with success and failure of self-quit attempts in the natural environment.

Among people who use marijuana frequently, emotional, social, and environmental correlates of their marijuana use may predict whether they will lapse when attempting to quit. Young people who use marijuana to cope or conform experience reduced negative affect following marijuana use (Ross et al., 2018), which may reinforce use for affect management and impede efforts to abstain. Marijuana desire is higher when with friends (Shrier, Walls, Kendall, & Blood, 2012), and use is more frequent when there are social cues, such as seeing someone using marijuana, being at a party, and being offered marijuana (Hughes, Fingar, Budney, Naud, & Helzer, 2014). Time of day is also associated with marijuana desire (Shrier et al., 2012) and dose (Shrier, Walls, Rhoads, & Blood, 2013). In research on relapse, first use following substance use treatment is associated with social situations, urges, and both negative and positive emotional states (Ramo & Brown, 2008). Research has not yet examined prospectively how daily life experiences of marijuana use relate to risk of lapse when young adults attempt to abstain.

Anticipating a self-quit attempt may result in greater success. Among adults using marijuana daily/near-daily who tried to quit on their own, planning activities during a quit attempt, especially telling someone about efforts to stop or reduce use, predicted greater abstinence, yet most did not prepare for their quit attempt ahead of time (Hughes et al., 2016). To our knowledge, previous studies have not used intensive data collection (i.e., Ecological Momentary Assessment; EMA (Shiffman, 2000)) to determine affective and socio-environmental factors associated with lapse that might be foci of intervention in advance of (as opposed to during) a quit attempt. EMA can gather data in the natural environment in near-real time, adding ecological validity and reducing recall bias. Such information would aid in developing individualized treatment approaches that target these factors as they arise in daily life before and during attempted abstinence.

In this exploratory study of young adults wishing to quit marijuana, we sought to identify momentary experiences during a period of marijuana use that could, along with individual characteristics, predict risk of lapse during a subsequent period of attempted abstinence.

2. Material and methods

2.1. Participants

We conducted a prospective, observational study of marijuana use and attempted abstinence in a community sample of young adults who were using marijuana daily/near-daily (≥ 5 days per week in the past 3 months), desiring to quit and planning to try on their own, willing to abstain for two weeks, and not currently in treatment. From November 2015 through October 2016, individuals age 18–25 years were recruited through twice-daily Craig's List ads describing the study. Ad respondents were screened for eligibility by telephone. Individuals were excluded if they would be out of their usual routines during 30-day study or screened positive for hazardous alcohol consumption on the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001).

Of 105 young adults expressing interest, 40 enrolled (Fig. 1). Five participants with urinary 11-tetrahydrocrocannabenoid-carboxylic acid (THC-COOH) < 5 ng/mL (inconsistent with use) were excluded. One had no use reports during the 2-week period before attempted abstinence; analyses included the remaining 34 participants (M ± SD = 21.96 ± 2.49 years of age, 47.1% female, and of diverse race/ethnicity; Table 1). They reported using marijuana Mdn = 11 times in the past week (IQR 5–20.5). Nearly all (94%) had CUD and 27% had another SUD [8 (24%), alcohol and 1 (3%), hallucinogens].

2.2. Procedures

Following informed consent, participants completed a baseline computerized survey of sociodemographic characteristics, substance use history, and marijuana use expectancies, motives, problems, and self-efficacy to abstain. Participants were withdrawn if they reported severe SUD with drugs other than marijuana or nicotine. Participants provided urine for quantitative THC-COOH analysis, downloaded the study application (MetricWire, Inc.) on their personal smartphone, and were trained to complete EMA reports.

EMA reports were prompted by randomly-timed signals 6 times/day (signal-contingent momentary reports) and once daily at 10 pm (time-contingent daily reports). Momentary reports assessed marijuana use, craving, availability, situational permissibility, and confidence not to use. If use since last signal was reported, additional questions assessed companionship, time of day, reason for use, and feelings about use. Daily reports assessed use in the past 24 h.

Participants provided EMA data for a 2-day practice period, then received feedback on their response rates and reporting problems were addressed. Next, participants were instructed to complete EMA reports for two weeks (Buckner, Zvolensky, & Ecker, 2013; Shrier et al., 2013), using marijuana as they usually did (use period). At the end of these two weeks, Participants were contacted by text message and/or phone call, advised about their response rates, and instructed to begin two weeks of marijuana abstinence the next day while continuing EMA reporting. After two weeks of attempted abstinence, participants returned for an exit interview and survey; 100% completed the study. Participants were offered remuneration commensurate with completed study activities ($\leq \$250$) and provided with marijuana information and treatment resources. The protocol was approved by the investigators' institutional review board. Participants' privacy was protected by a Certificate of Confidentiality.

2.3. Response rates

EMA response rates were Mdn (IQR) 74.4% (60.4%–80.1%) for momentary and 85.7% (71.4%–92.9%) for daily during the use period, and 63.7% (51.3%–77.4%) for momentary and 75% (58.0%–92.9%) for daily during attempted abstinence. Participants completed 1933 momentary reports [Mdn (IQR) 60 (50–65) per participant] and 285 diaries [12 (10 − 13) per participant] during the use period, and 1720 momentary reports [51 (40.75–60) per participant] and 270 diaries [9.5 (7–13) per participant] during attempted abstinence.

2.4. Measures

2.4.1. Marijuana use

Marijuana use was assessed on momentary reports with "Since the last signal you answered, have you used marijuana?" and, if yes, when marijuana was used (early morning 12:00 am–5:55 am, morning 6:00 am–11:55 am, afternoon 12:00 pm–5:55 pm, evening 6:00 pm–11:55 pm). Past-24-hour use was assessed on daily diaries (yes/no). We counted days of marijuana use during the use period if use reported on either momentary or daily report. We defined lapse as use reported on any momentary or daily report during attempted abstinence. Time to reporting first use during attempted abstinence was determined using time from midnight at the start of the attempted abstinence period. For reports indicating marijuana use that were made on the first day of attempted abstinence, time interval of the episode distinguished between use before midnight (during the use period) from use midnight and later (during the attempted abstinence period).

2.4.2. Baseline characteristics

Age, sex, race/ethnicity, school and work status, past-week marijuana use frequency, age at first use, and age first started to use ≥ 3 times/week were ascertained with questions from previous research