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Change in motives among frequent cannabis-using adolescents: Predicting treatment outcomes

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ABSTRACT

Background: Heavy cannabis use has been associated with negative outcomes, particularly among individuals who begin use in adolescence. Motives for cannabis use can predict frequency of use and negative use-related problems. The purpose of the current study was to assess change in motives following a motivational enhancement therapy (MET) and cognitive behavioral therapy (CBT) intervention for adolescent users and assess whether change in motives was associated with change in use and self-reported problems negative consequences.
Methods: Participants (n = 252) were non-treatment seeking high school student cannabis users. All participants received two sessions of MET and had check-ins scheduled at 4, 7, and 10 months. Participants were randomized to either a motivational check-in condition or an assessment-only check-in. Participants in both conditions had the option of attending additional CBT sessions. Cannabis use frequency, negative consequences, and motives were assessed at baseline and at 6, 9, 12, and 15 month follow-ups.
Results: There were significant reductions in motives for use following the intervention and reductions in a subset of motives significantly and uniquely predicted change in problematic outcomes beyond current cannabis use frequency. Change in motives was significantly higher among those who utilized the optional CBT sessions.
Conclusions: This study demonstrates that motives can change over the course of treatment and that this change in motives is associated with reductions in use and problematic outcomes. Targeting specific motives in future interventions may improve treatment outcomes.
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1. Introduction

Drinking and drug use motives are important predictors of alcohol and drug use and related negative consequences (Banes et al., 2014; Buckner, 2013; Kuntsche et al., 2005). Identification of motives for use provides potential targets for secondary prevention efforts and treatment interventions. For example, using in order to cope with negative affect assessed prior to an intervention for cannabis using adolescents positively predicted prevalence of use, dependence symptoms, and problems following the intervention (Fox et al., 2011). However few studies to date have examined whether users' motives for use change following intervention and whether changes in motives are related to changes in use and related problems.

Research with adult cannabis users found changes in motives for use following participation in a combination motivational enhancement therapy (MET) and cognitive behavioral therapy (CBT) treatment (Banes et al., 2014). Additionally, the change in motives – particularly the coping motive – was associated with reductions in cannabis use frequency, problems, and dependence symptoms at later follow-ups. A recent motivational and coping skills-based intervention also reported reductions in motives for drinking post-intervention (Blevins and Stephens, 2016).

The majority of previous research on cannabis use motives has utilized the Marijuana Motives Measure (MMM; Simons et al., 1998), a five-factor scale derived from research on drinking motives (Drinking Motives Questionnaire-Revised (DMQ-R); Cooper, 1994).

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The DMQ-R included four motives based on valence (positive, negative) and source (internal, external): enhancement (positive, internal), social (positive, external), coping (negative, internal), and conformity (negative, external). The MMM added the motive of expansion of the mind to account for distinct effects associated with cannabis. However, a more recent cannabis motive measure, the Comprehensive Marijuana Motives Questionnaire (CMMQ; Lee et al., 2009) utilized a bottom-up approach to identify additional motives for use in a college population. The CMMQ has 12 subscales that include motives assessed by the MMM as well as previously unstudied reasons for using. Notably, the negative valence, internal source motive of social anxiety absent from the MMM was added. Negative affect motives for use have been found to be markers of problematic use and outcomes (e.g., Fox et al., 2011; Grant et al., 2007), suggesting that adding additional negative affect motives may be useful. Indeed, the CMMQ motive scales explained additional variance in use and consequences above and beyond the MMM in an initial study with college students (Lee et al., 2009). Confirmatory factor analysis of the CMMQ showed that the factor and subscale structure were replicated in much younger and more problematic population of cannabis users (Blevins et al., 2016). The present paper extends work on the clinical utility of the CMMQ by using the same sample of adolescent cannabis users to study change in motives following an intervention for cannabis use. If changes in particular motives following intervention are related to changes in negative consequences of cannabis use it will strengthen the argument for targeting those motives in future treatment programs.

The purpose of the present paper is to examine change in motives assessed with CMMQ among adolescents participating in a MET/CBT-based intervention. The current evaluation has two goals: (1) to assess whether motives changed following intervention; and (2) to identify changes in motives that were associated with cannabis use outcomes. Given the relative lack of research that utilizes the CMMQ, this study aimed to evaluate specifically whether the previous relationships between motives and outcomes were replicated and whether additional motives scales were useful predictors. It was hypothesized that most motives would be reduced through participation in the intervention. Further, it was predicted that reductions in negative affect motives such as using to cope or using for social anxiety would be particularly associated with a reduction in use and problematic outcomes.

2. Methods and materials

2.1. Parent clinical trial design

In order to examine whether motives for marijuana use changed following an intervention, data from a randomized controlled treatment trial for cannabis-using adolescents were examined (Walker et al., in press). The goal of the parent clinical trial was to determine whether periodic MET-based check-ins following an initial two-session MET intervention would lead to greater long-term reductions in use and problematic outcomes. Participants were 252 adolescent marijuana users randomized to either a motivational check-in condition (MCI; n = 128) or an assessment-only check-in condition (ACI; n = 124). All participants initially received two sessions of MET designed to encourage reduction in cannabis use (see Berghuis et al., 2006; Walker et al., 2011). The check-ins (either MET-based or assessment-only) were scheduled at 4, 7, and 10 months. Cannabis use and negative consequences outcomes were assessed at 6, 9, 12, and 15 months. Participants in both conditions had the option to participate in individual CBT sessions throughout the first twelve months of the follow-up period if they desired additional help in reducing cannabis use. The primary hypothesis of the parent trial was that the MET-based check-in sessions dispersed throughout the follow-up period would encourage greater reductions in cannabis use and negative consequences than the assessment-only check-ins and that some of this effect would be mediated by greater attendance of the optional CBT sessions by those in the MCI condition. The Institutional Review Boards at the University of Washington and Virginia Tech approved all procedures.

2.2. Participants

The study recruited high school freshman, sophomore, and juniors from 6 Seattle, Washington high schools. A total of 445 students initially expressed interest in participating in the study. A total of 252 students were eligible and consented to participation in the study. The IRB agreed that parental consent was not required for participation. Individuals were excluded from participation if, at screening, they used cannabis fewer than 9 days over the past 30 (n = 154, 84.6%) in an attempt to recruit participants who were using on weekdays (c.f. Walker et al., 2011), were planning on moving outside of the Seattle region through the course of the study (n = 27, 14.8%), if they were seniors and planning on graduating before the end of the study (n = 19, 10.4%), or if they had a serious medical or psychiatric condition (n = 3, 1.6%). Eleven individuals who were eligible for participation declined enrollment, which left a final sample of 252 for the intervention. At the baseline assessment, the sample reported cannabis use on an average of 37.07 days of the last 60 (SD = 15.05, range = 1 day to 60 days), and was comprised of mostly males (68%) with a mean age of 15.84 at baseline (SD = 0.96; range = 14-17 at baseline, 15–19 at the final follow-up assessment). Three-quarters of the sample met diagnostic criteria for a DSM-IV cannabis use disorder (75.0%) (American Psychiatric Association, 2000). The sample was fairly diverse: 59% Caucasian, 20% multiracial, 6% African American, 4% Asian, and 11% other. Additional details on recruitment and demographics can be found in the main outcomes paper (Walker et al., in press).

2.3. Measures

All measures used in this paper were administered and answered privately via computer at baseline and through online assessments accessed by participants at each follow-up assessment. Motives for cannabis use were measured at baseline and all follow-ups using the CMMQ (Lee et al., 2009), a 36-item measure that asks participants how frequently they use cannabis for various reasons. Each of the 12 subscales consists of 3 items that were averaged to create the scale scores used in the current analyses. The CMMQ utilizes a scale of 1 ("almost never or never") to 5 ("almost always or always"). Internal consistency reliabilities (alphas) for the 12 scales across baseline and follow-up assessments ranged across time as follows: Enjoyment (0.79–0.90), Conformity (0.66–0.85), Coping (0.85–0.91), Experimentation (0.76–0.89), Boredom (0.82–0.93), Alcohol Use (0.77–0.91), Celebration (0.88–0.93), Altered Perceptions (0.86–0.94), Social Anxiety (0.76–0.91), Relative Low Risk (0.71–0.88), Sleep (0.85–0.91) and Availability (0.69–0.89). For further information on the psychometric properties of the CMMQ in the present sample see Blevins et al. (2016).

Self-reported cannabis use frequency over the last 60 days was measured at baseline and each follow-up with a single question from the Global Appraisal of Individual Needs (GAIN; Dennis et al., 2008). Participants reported the total number of days of use over the past 60 days. This measure has demonstrated good reliability and predictive validity and has been found to have excellent comparability with other indices of use (Dennis et al., 2004).

Cannabis-related problems were assessed with the Marijuana Problems Index (Johnson and White, 1995), a 23-item measure

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