Clinic- and Home-Based Contingency Management Plus Parent Training for Adolescent Cannabis Use Disorders

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Objective: The aim of this study was to conduct a randomized test comparing 2 multicomponent, contingency management interventions, 1 with and 1 without a full parent training curriculum, and an individual treatment for adolescent cannabis use disorders.

Method: A total of 153 adolescents who met *DSM-IV* criteria for cannabis abuse or dependence were randomized to motivational enhancement therapy/cognitive-behavioral therapy (MET/CBT), MET/CBT+abstinence-based contingency management (CM), or MET/CBT+CM+Parent Training (PT).

Results: Overall, during treatment, abstinence was greater for youth receiving clinic- and home-based CM without PT compared to those who received individual MET/CBT. There was no additional benefit of the full PT curriculum on marijuana use, youth externalizing problems, or parenting.

Conclusion: These results suggest that clinic- plus home-based CM for cannabis use disorders can increase rates of abstinence during treatment over and above an evidence-based treatment (individual MET/CBT), but in this study the addition of a comprehensive parenting training curriculum did not further enhance efficacy.

Clinical trial registration information—Treatment for Adolescent Marijuana Abuse; http://clinicaltrials.gov; NCT00580671.

Key Words: cannabis, contingency management, parent training

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Cannabis is the most frequently misused illicit substance among youth and has substantial associated consequences. Cannabis use among teens far exceeds that of any other illicit substance.[1] Teens appear to be more vulnerable to the development of cannabis use disorders (CUD) than adults, as indicated by more rapid development of CUD from time of initiation.[2] Teens who use cannabis regularly are at high risk for the following: poor academic performance; school dropout; delinquent behavior; arrest; other psychiatric problems; emergency room visits; other substance use disorders; driving while taking drugs; and unprotected sex.[3] The impact of regular cannabis use on brain structure and function may also be cause for concern.[4]

More effective interventions and strategies are sorely needed for adolescents with cannabis and other substance use disorders. In the United States, 76% of all youth admissions to substance use treatment report cannabis as the primary substance.[5] Overall, adolescents in treatment for substance abuse have better outcomes than those not in treatment, and well-specified types of stand-alone, individual, group, family, and integrated approaches demonstrate efficacy.[6] Comparing relative efficacy of treatment models is difficult, given the use of diverse outcomes across clinical trials; however, specific family-based approaches and packages combining more than 1 evidence-based approach appear to be most effective. That said, even with these interventions, treatment effects have much room for improvement. For example, in the multisite Cannabis Youth Treatment Study[7] that compared 5 evidence-based interventions, less than 25% of adolescents were abstinent or in recovery at the end of treatment and across 12 months of follow-up, with little difference observed between treatments.

One candidate for enhancing outcomes is abstinence-based contingency management (CM). CM interventions attempt to modify the substance user's environment such that drug abstinence is carefully monitored and reinforcing events (e.g., tangible rewards) occur when abstinence is achieved. Robust data support CM for adult multiple types of substance use treatment outcomes among diverse populations with a mean effect size of d = 0.42.[8] For cannabis, studies have shown that adding CM to behavioral therapy enhances abstinence outcomes.[9,10] Unfortunately, there are only a few studies testing CM for adolescent substance use. Several studies have shown positive effects of CM on adolescent tobacco use.[11,12] CM also increased abstinence rates relative to usual drug court

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services[13] and relative to usual services after discharge from residential treatment.[14] Two outpatient clinical trials for cannabis and other substance use problems (1 of which was a feasibility study) did not show clear evidence of CM effects on abstinence.[15,16]

We developed an outpatient CM intervention model to enhance motivation to engage in treatment and to engender cannabis and other drug abstinence that uses a clinic-based abstinence reinforcement program[17] and home-based CM that taught parents to use rewards and consequences contingent on substance testing results. In addition, adolescents received individual therapy (motivational enhancement therapy/cognitive-behavioral therapy: MET/CBT) training,[18,19] and parents received a comprehensive parent training (PT) curriculum.[20] Results of an initial trial of this multicomponent intervention[17] showed that MET/CBT+CM+PT enhanced abstinence outcomes relative to MET/CBT, engendering more weeks of continuous cannabis abstinence during treatment (d = 0.48, medium effect). However, the independent effects of CM versus PT were not assessed.

The current study sought to replicate and extend these results in a more diverse population, comparing 3 treatment conditions: MET/CBT, MET/CBT+CM, and MET/CBT+CM+PT. We hypothesized that both CM conditions would engender more cannabis abstinence and less frequent cannabis use during treatment compared to MET/CBT. In addition, we hypothesized that PT would lead to greater abstinence, less frequent use, and greater improvements in parenting and youth externalizing than MET/CBT and MET/CBT+CM during the follow-up period.

METHOD

Study Participants

The study was conducted in compliance with the institutional review board of the University of Arkansas for Medical Sciences. Families were referred to our clinic located within an academic medical center by schools, the juvenile justice system, community therapists, or physicians, or were self-referred. All treatment services were funded by a National Institutes of Health (NIH) grant. Assessments were completed by research staff. Inclusion criteria were as follows: age 12 to 18 years (if 18 years, in high school); reported use of cannabis during the prior 30 days or a cannabis-positive urine test; criteria met for cannabis abuse or dependence; and living with a parent or guardian who agreed to participate. Dependence on other substances or evidence of cognitive difficulty that would preclude participation in MET/CBT were exclusion criteria.

Of 304 youth assessed, 113 did not meet inclusion/exclusion criteria; 38 declined treatment or did not complete the intake; and 153 (136 male and 17 female) enrolled in the trial (Figure 1). Informed consent was obtained from the parent(s); assent was obtained from the adolescent (or consent if the participant was 18 years of age). Youth were enrolled between December 2007 and March 2011, and follow-up assessments were completed by July 2012.

Minimum likelihood allocation[21] was used to randomly assign participants sequentially to 1 of the 3 conditions while balancing

FIGURE 1 Consolidated Standards of Reporting Trials (CONSORT) diagram. Note: CBT = cognitive-behavioral therapy; CM = contingency management; MET = motivational enhancement therapy; PT = parent training; UA = urinalysis.