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Individual Mindfulness-Based Psychotherapy for Cannabis or Cocaine Dependence: A Pilot Feasibility Trial

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Abstract

Background—Mindfulness-based approaches may be effective treatments for substance use disorders (SUDs), but they have only been investigated for SUDs in the group setting.

Methods—A novel 10-week individual mindfulness-based psychotherapy was provided weekly to participants. Tolerability and therapeutic feasibility were assessed by retention rates, incidence of adverse events or clinical worsening, and abstinence rates at the end of the protocol.

Results—Twenty-five patients were enrolled overall, and 19 completed (74% overall retention rate). Of the 14 cannabis dependent patients enrolled in the study, 11 completed (79%), and 8 achieved abstinence (57% by intent-to-treat analysis) at 10 weeks. Of the 11 cocaine dependent patients, 8 completed (73%), and 6 achieved abstinence (55% by ITT) at 10 weeks. Abstinence rates were substantially greater than those of historical comparison groups.

Conclusions—These findings indicate that mindfulness training can be tolerably and feasibly extended to the individual psychotherapy setting for the treatment of cocaine or cannabis dependence.

INTRODUCTION

Defined as the capacity to attend to phenomena on a moment-to-moment basis, non-judgmentally, and with accepting, relaxed awareness, mindfulness has become increasingly important in the fields of depression treatment, affect regulation, and substance use disorder treatment.^{1,2} Various mindfulness-based treatments have emerged over the past 30 years for a spectrum of psychiatric disorders, including most recently mindfulness-based relapse prevention (MBRP) for substance use disorders (SUDs).³ MBRP is a group-based intervention that incorporates elements of mindfulness-based stress reduction (MBSR) and relapse prevention therapy, and found effective in small trials for poly-substance dependence and, in an adapted form, for nicotine dependence.^{4–6}

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While group-based mindfulness training has been found helpful, there have not been any investigations to date evaluating mindfulness training for SUD treatment in the individual setting, an important avenue to consider for several reasons. First, some patients prefer the individual setting. Further, the individual setting may be more conducive to skills training than is the group setting, as it has the advantage of targeting individual needs and limitations.⁷ This is particularly relevant to mindfulness training, which is largely oriented around the acquisition of a sometimes unfamiliar set of skills and viewpoints.⁸ Individuals with SUDs may require such a targeted approach, moreover, due to the significant mindfulness deficits that their psychopathology presents.¹ In addition, the number of patients required to form and maintain a functional group may make individual treatment easier to administer.⁷

The purpose of this study was therefore to investigate the therapeutic feasibility and tolerability of individual mindfulness-based psychotherapy for SUDs, and specifically for cocaine dependence or cannabis dependence. We predicted that individual mindfulness-based psychotherapy would be well-tolerated, associated with high retention rates, and helpful for a majority of patients.

METHODS

Participants

Individuals applying for treatment at Columbia University's Substance Treatment and Research Service (STARS) outpatient clinic in New York City were recruited for this study. Clinical screening was conducted by trained masters and doctoral level clinical psychologists, and included the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV; SCID Axis I/P version) and a clinical interview assessing substance abuse severity. Assessments included a medical history, laboratory tests, electrocardiogram (ECG), a physical examination, and a psychiatric evaluation. Those who were either ineligible for participation in other trials at STARS, or who were personally disinclined to take medications, were referred to this study for additional screening. Included were men and women 18–60 years old, who met criteria for current cocaine or cannabis dependence, and who provided a urine sample positive for cocaine or cannabis metabolites. An interest in learning mindfulness was not necessary for inclusion. Individuals with severe psychiatric disorders were excluded, as were individuals receiving psychiatric care, psychotherapy or other SUD treatment (eg, 12-step groups). Other exclusion criteria include significant medical problems or medically problematic physiological dependence. 32 individuals were screened for the study, 5 were excluded, 2 declined to participate, and a total of 25 participants were enrolled, 14 with cannabis dependence and 11 with cocaine dependence.

Study Procedures

The Institutional Review Board (IRB) at the New York State Psychiatric Institute approved all consent, screening, and study procedures, which ran from March 2009 to August 2010. Following study consent, participants were enrolled into this 10-week protocol. Participants attended the STARS clinic weekly, where they met with nursing and research staff, as well

as the study therapist. Five dollars were provided at each visit to defray the costs of travel. At every visit, urine toxicology was obtained and vital signs were collected by nursing staff, and a time-line follow-back (TLFB) was administered by research staff.

Participants then met for 50 min with a therapist-psychiatrist with experience in providing mindfulness training and supportive psychotherapy, and with several years of experience teaching meditation more generally in clinical and didactic settings. The novel 10-week treatment protocol was developed by the principal investigator and included a general timeline for mindfulness training and precise descriptions of each mindfulness exercise, as well as specific information regarding what would occur during each session quarter. In the first quarter of each session, participants were allowed to discuss ongoing problems or concerns in a supportive psychotherapy framework.⁹ During the second quarter, the therapist provided guidance on how mindfulness might be helpful for addressing problematic behaviors, encouraged or imparted various viewpoints pertaining to mindfulness (ie, the transience of all phenomena, no matter how distressing in the moment), and provided insight on how patients might better practice mindfulness in daily life. The final half of each session was devoted to mindfulness training, with the standardized exercises based on those of MBSR and similar mindfulness-based interventions.^{3,10} The yoga exercises of MBSR, however, were not included, certain exercises were added (ie, meditation on certain affective states), and the timeline of training in the manual was also novel. Although participants were strongly encouraged to be sober during sessions, all individuals able to engage with therapy procedures, including those who might be mildly intoxicated, were allowed to participate.

Mindfulness training in this protocol involved the following practices. The Raisin Exercise (Week 1) guides participants to approach a single raisin from all sensory modalities, with the intention to experience it as if for the first time. This sense of “newness” of the object(s) of attention is cultivated in subsequent exercises as well. Posture Training (2) helps participants find a seated position that is comfortable, alert, and relaxed. Breathing Meditation (3) guides participants to focus on their breathing while seated. The Full Body Scan (4) involves systematically attending to sensations, thoughts, and emotions, and concludes with the open, non-reactive, and sustained attention characteristic of mindfulness meditation. Sitting Meditation (Weeks 5 and 10), Standing Meditation (6), and Walking Meditation (7) involve practicing mindfulness meditation in various positions. Meditation on Particular States guides patients to recreate particular affective states—anger, frustration, and craving (8), or compassion, tenderness, and forgiveness (9)—and to experience them mindfully. At each session, in order to self-assess fidelity to the protocol, the therapist documented what therapies and interventions were provided, the duration of each, and whether there were any deviations from the manual. The therapist also documented whether participants practiced the mindfulness exercises assigned between sessions.

At the end of the 10-week protocol, patients were offered an additional 4 weeks of weekly supportive therapy,⁹ during which the TLFB and urine toxicology continued to be obtained weekly. Patients who desired additional treatment following the 4-week period were appropriately referred to further care (therapy or 12-step groups).

Data Analysis

Tolerability outcomes were treatment retention (defined as study completion) and incidence of adverse events or clinical worsening. Feasibility outcomes were abstinence rates. Consistent with previous trials at our institution and elsewhere, abstinence was defined as 2 weeks or greater of no drug use by TLFB, confirmed by urine toxicology. Tolerability was considered good if more than half of enrolled patients completed the 10-week protocol, with few adverse events and incidents of clinical worsening. In prior placebo-controlled pharmacology trials at our research clinic incorporating an effective psychotherapy platform lasting 10–12 weeks, less than 20% achieve abstinence from either cocaine or cannabis in the placebo (as well as active) groups.^{11–13} Thus, a clinically meaningful outcome was defined as an abstinence rate more than twice that (>40%) of the placebo arms during the last 2 weeks of the study. *t*-Tests were performed between mean levels of drug use at baseline (amount, days per week) between those abstinent at 10 weeks and those not abstinent (including drop-outs) to assess for group differences. T-tests were also performed between mean levels of drug use at baseline and at end of study in non-abstinent completers.

CASE STUDIES

Case 1

Mr. X was a 42-year-old single White male employed as a computer repairman seeking treatment for cocaine dependence. Mr. X reported no prior experience with meditation, and had no significant medical or psychiatric history. He had been smoking free-base cocaine for 23 years without any periods of sustained abstinence. At the time of enrollment, he was using two to three times a week, at \$60 to \$100 each occasion. He was interested in achieving abstinence because he believed cocaine was interfering with important aspects of his life, most notably his capacity for intimate relationships.

Mr. X found the mindfulness training provided in sessions rewarding from the start, stating that he enjoyed the relaxation, the process of delving into and “taking apart” his moment-to-moment experience “as if it were a computer,” and the “lightness” and “freshness” that he experienced afterwards. Further, he found it beneficial to discuss his problems, hopes, and goals in a supportive setting.

At 3 weeks into the therapy, however, he endorsed difficulty in practicing mindfulness at home, articulated skepticism about how mindfulness might help him, and continued to use cocaine at baseline levels. The therapist modified the supportive therapy and mindfulness training to better meet these challenges. The aims of the therapy became focused on improving his regular mindfulness practice, developing a shared narrative regarding the ways in which mindfulness may be helpful in achieving his treatment goals, and providing guidance on how mindfulness and related practices or perspectives might benefit him in high-risk situations.

The patient grew more motivated to cultivate mindfulness in his daily life when he came to conceptualize it in terms that resonated with him—as a “return to innocence” and to the “mind of a child;” as a “cleaning up” of his perspectives; and as improved awareness. He also found in mindfulness training an avenue for developing spirituality, an important and

long-standing personal goal. High-risk situations and experiences were reviewed at each session, and the patient set out to attend to cravings, thoughts, and triggers mindfully throughout the week, using both mindfulness practices and mindfulness-based perspectives/insights. He also found it possible, as he continued to practice awareness and intentionality, to reduce the frequency of unreflective behaviors, including those oriented around drug use. By week 4, he was using cocaine once every several days, and at a substantially smaller amount than was reported at baseline.

As rapport with the therapist continued to strengthen, he grew comfortable enough to disclose, though with some embarrassment, that his cocaine use was often coupled with pornography and masturbation, and that he has come to strongly associate cocaine use with sexual arousal and release. Mindfulness training was applied toward exploring and “taking apart” the link between the two, as well as towards cultivating fuller ways of relating both to sex and to relationships. His last documented cocaine use occurred at week 6. For the rest of the study, and through the follow-up period, Mr. X continued to practice mindfulness regularly outside of sessions, and would often meditate in the evenings after dinner. He also continued to reflect on ways that he can change his lifestyle, such as improving his sleep patterns and level of physical exercise, so that his daily habits could be more conducive to mindful living and continued abstinence.

Case 2

Ms. Y was a 53-year-old unmarried, childless Hispanic woman employed as an usher in a theater with a history of cannabis dependence, nicotine dependence, and alcohol abuse, as well as a history of dysthymia, in partial remission, and major depressive disorder, in full remission. Ms. Y had engaged in psychotherapy for a short period in her 20s, but neither depressive disorder had been treated with pharmacotherapy due to her aversion to taking psychotropic medications. She had been abstinent from cannabis for 3 years in her 30s, but had never achieved abstinence from alcohol. At the time of enrollment, she was using \$10 of cannabis a day and drinking four beers five evenings a week. “I’m not happy,” she said, “and I need to change some things about my life.” She had attempted meditation during her 20s, but was discouraged after a few weeks because she felt she was doing it incorrectly.

Over the first 2 weeks of the protocol, the patient described her cannabis (as well as alcohol) use as “self-medication”; she found them helpful at ameliorating anxiety, ruminations, and loneliness, even as she recognized that any apparent benefit was short-lived and that she would invariably feel worse when the acute drug effects wore off. In addition, she reported a sense of demoralization in regards to various aspects of her life, including work, finances, and a stormy romantic relationship; she struggled with low confidence and poor self-efficacy, and doubted in her capacity to improve her situation. The mindfulness training and supportive therapy were aimed at addressing the patient’s difficulties with self-regulation, her problems with demoralization, and her use of substances to dampen uncomfortable states.

As with her previous experience with meditation, the patient felt discouraged by her perceived inability to “practice correctly”—that is, to “remain focused” and to achieve immediate peace and clarity while engaged in the practices. Aspects of mindfulness most

relevant to her difficulties, including acceptance, suspension of judgment, and self-compassion, were emphasized. It was also clarified, before each exercise, that the practice of mindfulness does not aim to achieve anything in particular (eg, “peace”), but simply involves observing oneself mindfully. Moreover, she was guided, while engaged in the exercises, towards gently and non-reactively attending to aversive experiences as they emerged, including self-criticism, discouragement, and sadness.

Ms. Y responded well to the guidance and instruction, and reported greater awareness of the entrenched modes of perception, emotion and thought that had been compromising her resilience and self-efficacy. By week 3, she began to feel “empowered” by the mindfulness training. She came to regard mindfulness as an inner source of freedom, intuition, and guidance. “It is this ability I always have,” she said, “to find my way in whatever [situation] life throws at me.” In addition, she deliberately began to substitute her evening “wind-down” period, during which she would ordinarily drink beer and smoke a joint in order to relax, with a mindfulness practice.

By week 4, the patient was practicing breathing meditation regularly. She found herself achieving clarity and “disentangling” her thoughts more easily, as well as better able to navigate feelings of loneliness and despair. She stopped using alcohol and cannabis by week 5, and also began to reduce her tobacco use, stopping completely by week 7. She hoped, she said, “to transform [her] life so that [she was] never in this kind of hole again.” As such, Ms. Y began to spend greater time in sessions reflecting on the thoughts, perspectives and patterns of behavior that had compromised her quality of life in the past; she also expressed feeling a greater distance and freedom from them. The patient developed an evening practice of sitting meditation, which she maintained through the follow-up period.

*Identifying characteristics have been modified to protect confidentiality.

RESULTS

Demographic and morbidity characteristics of the two groups, as well as treatment responses, are provided in Table 1. 25 patients were enrolled overall, and 19 completed (74% overall retention rate). Of the 14 cannabis dependent patients enrolled in the study, 11 completed (79%), and 8 achieved abstinence (57% by intent-to-treat analysis) by 10 weeks. Of the 11 cocaine dependent patients, 8 completed (73%), and 6 achieved abstinence (55% by ITT) by 10 weeks. All patients who completed the study also completed the 4-week period following the end of mindfulness training; abstinence status did not change over that period. There were no known cases of clinical worsening or significant adverse effects for any enrolled patients. Specifically, non-abstinent completers did not experience a worsening of their drug use. Additionally, all patients with co-morbid alcohol use disorders ($n = 3$) achieved abstinence from alcohol, as well as from the substance for which they sought treatment.

DISCUSSION

These findings indicate that mindfulness training can be tolerably and feasibly extended to the individual psychotherapy setting for the treatment of cocaine or cannabis dependence.

The high retention and abstinence rates also suggest that individual mindfulness-based psychotherapy represents a potentially effective intervention that warrants further research.

Mindfulness training has generally been investigated in group settings for the treatment of various disorders and conditions. As the first mindfulness-based intervention, MBSR was developed to improve quality of life and reduce stress¹⁰; was found to improve mood, anxiety and pain in those with chronic illness, among others^{2,14,15}; and has since become a standard template for mindfulness training in more recent mindfulness-based interventions, though certain practices might be tailored to the targeted condition.³ Like MBSR, these more recent interventions are primarily group-based, even though they may be adapted to the individual setting in clinical practice.⁸

Mindfulness training involves learning a variety of meditation-based techniques that, when consistently practiced, are intended to develop a capacity for non-reactive, accepting, purposive, and sustained attention. Mindfulness-based insights may also be imparted to or encouraged in participants, such as detachment from thoughts and emotions, an awareness of how thoughts and emotions alter perception, and recognition of the transient nature of phenomena. Mindfulness-based techniques and insights, however, might be difficult for the novice to grasp, particularly if there are cognitive, behavioral, or affective limitations.⁸ While the group-based approach has many benefits—including the capability to practice generalizing skills to high-risk situations, the structure and social support that it affords, the low costs associated with administering it widely, and the opportunity to discuss problems, insights, and challenges with peers undergoing comparable difficulties^{7,16}—a virtue of the individual psychotherapy setting is that the therapist can be more responsive to the deficiencies and limitations of the patient, while adapting the training and insight-promoting components accordingly (see Case 1).

This virtue is worth emphasizing given that mindfulness might be particularly difficult to develop in patients with SUDs, notwithstanding the encouraging findings from the MBRP trials. SUDs are characterized by various pathological mechanisms that may represent impaired mindfulness, such as deficient self-regulation, compulsive drug-seeking, limited insight, and disrupted intentionality.^{1,17} In addition, individuals with SUDs commonly exhibit traits that may also compromise mindfulness, including impulsivity, increased risk-taking, and heightened sensation seeking.¹⁸ An individual, patient-directed approach may therefore be optimal for cultivating mindfulness in this uniquely challenged population.

Mindfulness encompasses several domains, and the precise nature of mindfulness-related impairments may vary significantly among patients.¹⁷ Another virtue of the individual approach is that it can be responsive to the unique needs of individual patients. Mindfulness training may be beneficial in a number of ways: by improving attention and self-awareness; by revitalizing the capacity for healthy adaptation; by ameliorating drug-related ruminations and cravings; by reducing emotional reactivity, cue reactivity and stress sensitivity; by correcting problematic cognitions; and by providing a rewarding and relaxing alternative to drug use.^{1,19,20} The focus of training, especially in the individual setting, can be readily guided by the particular deficits and needs of the patient (see Case 2).

This individual-based protocol differs from most other mindfulness-based treatments in a few other key respects. First, this is a 10-week protocol, as opposed to the 8-week format characteristic of other mindfulness-based interventions. The protocol was lengthened to ensure that at least two sessions were devoted to mindfulness-based sitting meditation, which is the least structured and guided of the exercises, and therefore the most difficult practice for novices. Further, two sessions were devoted to meditation on affective states. The first was a meditation on states that might be distressing to the participant, such as craving and frustration, similar in approach to the “urge surfing” exercise of MBRP² or the RAIN (Recognize, Accept, Investigate, and Note) exercise.⁵ This exercise is intended to attenuate reactivity to distressing phenomena as well as to promote more awareness and acceptance of the cognitive, affective, and sensory aspects of uncomfortable states.^{1,3–5} The inclusion of an exercise modeled on loving-kindness meditation (meditation on favorable and directed affective states such as compassion, tenderness, and forgiveness) represents another innovation. Though loving-kindness meditation is fundamental to the mindfulness tradition in Buddhism, it has not been typically incorporated into available mindfulness-based interventions. However, its importance in promoting acceptance, correcting distorted cognitions, and fostering calm decision-making is becoming recognized by researchers.^{5,21} The feasibility of the present intervention, as well as the recently demonstrated clinical efficacy of another mindfulness-based intervention that also incorporates a practice based on loving-kindness meditation,⁵ indicate that loving-kindness meditation can be viably incorporated into mindfulness training, with good clinical effect.

This study has several limitations, common to most small, non-controlled trials. The first is that efficacy is not possible to determine due to the lack of proper controls; it is therefore not possible to determine whether the apparent benefits of the intervention are due to mindfulness training itself, or to other factors related to the supportive therapy, therapist, staff or setting. A related limitation is that one therapist, the principal investigator, provided the intervention to all participants. While this protects against inter-therapist discrepancies, it is less than ideal; outcome measures (urine toxicology, TLFB) were collected by research staff in order to address potential problems that might arise from the direct involvement of the principal investigator. Further, though the therapist has training in and experience with mindfulness training he has not been certified in MBSR or other mindfulness-based interventions. A final limitation is that the sample partly constitutes a sample of convenience, even though patient characteristics and use patterns were generally similar to those of patients in other studies at our research site.^{11–13}

In summary, this study indicates that individual mindfulness-based psychotherapy is a promising treatment for SUDs that warrants further research. Patients with SUDs commonly have impairments that may make the development of mindfulness more challenging; an individual approach may therefore be optimal in this population. Future trials with the appropriate randomized, controlled design will be helpful in evaluating the efficacy of this psychotherapy. Researchers may also consider comparing mindfulness training in the group and individual settings to test the hypothesis that individuals with SUDs may derive greater benefit from an individual approach.

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TABLE 1

Demographic, morbidity characteristics, and treatment response of the two groups

	Cannabis dependence (<i>n</i> = 14)	Cocaine dependence (<i>n</i> = 11)
Age, years (SD)	33.7 (7.4)	38.9 (8.3)
% Female	57% (<i>n</i> = 8)	36% (<i>n</i> = 4)
% Single	35% (<i>n</i> = 5)	45% (<i>n</i> = 5)
% Employed	79% (<i>n</i> = 11)	82% (<i>n</i> = 9)
% High school graduate	86% (<i>n</i> = 12)	82% (<i>n</i> = 9)
% Caucasian	64% (<i>n</i> = 9)	55% (<i>n</i> = 6)
% African American	21% (<i>n</i> = 3)	36% (<i>n</i> = 4)
% Depressive disorder	21% (<i>n</i> = 3)	9% (<i>n</i> = 1)
% Anxiety disorder	7% (<i>n</i> = 1)	9% (<i>n</i> = 1)
% Alcohol use disorder	7% (<i>n</i> = 1)	18% (<i>n</i> = 2)
Use days per week (SD)	6.4 (.4)	3.4 (1.2)
Use per day, \$ (SD)	10.6 (2.4)	41.6 (9.8)
Comparison of baseline use (SD)*	6.2 (.4) vs. 6.6 (.33) 10.25 (2.25) vs. 11.0 (2.75)	3.6 (1.2) vs. 3.3 (1.3) 42.0 (10) vs. 41.1 (10.6)
Comparison with end-of-protocol use (SD) [†]	6.6 (.3) vs. 5.7 (1.5) 10.3 (.9) vs. 8.8 (3.4)	3.4 (1) vs. 3.0 (1) 40.5 (16) vs. 40.0 (14)
% Completed	79% (<i>n</i> = 11)	73% (<i>n</i> = 8)
% Practicing [‡]	72% (<i>n</i> = 10)	55% (<i>n</i> = 6)
% Abstinent, ITT [§]	57% (<i>n</i> = 8)	55% (<i>n</i> = 6)

* Baseline use comparison between end-of-protocol abstinent and non-abstinent groups, days per week followed by amount per day; all comparisons were nonsignificant ($p > .05$);

[†] Comparison of baseline and end-of-protocol substance use in non-abstinent completers, frequency followed by amount; all comparisons were non-significant ($p > .05$);

[‡] Practicing take-home exercises at least once between sessions, on most weeks;

[§] By intent-to-treat analysis.