

Mindfulness-Based Relapse Prevention for Alcohol and Substance Use Disorders

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Cognitive-behavioral approaches to alcohol and drug use disorders have received considerable empirical support over the past 20 years. One cognitive-behavioral treatment, relapse prevention, was initially designed as an adjunct to existing treatments. It has also been extensively used as a stand-alone treatment and serves as the basis for several other cognitive and behavioral treatments. After a brief review of relapse prevention, as well as the hypothesized mechanisms of change in cognitive and behavioral treatments, we will describe a "new" approach to alcohol and drug problems called mindfulness-based relapse prevention. Preliminary data in support of mindfulness-meditation as a treatment for addictive behavior are provided and directions for future research are discussed.

Keywords: mindfulness; meditation; relapse prevention; substance abuse; substance abuse treatment

The excessive use of alcohol and other substances represents a significant public health problem worldwide (World Health Organization [WHO], 1999). The United Nations Office for Drug Control and Crime Prevention (UNODCCP, 2002) recently reported that approximately 185 million people worldwide are current drug users, which suggests the demand for treatment is on the rise. The lack of empirically supported treatments, and the minimal utilization of available treatments by those needing services indicates that brief, innovative treatments to serve those individuals with alcohol and drug use disorders are highly desired (Marlatt & Witkiewitz, 2002). Mutual support groups, such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), are the most commonly available treatments in many developed countries worldwide (Room, 1998). However, these approaches may not be clinically indicated for certain drug and alcohol abusers (Marlatt, 1983; Marlatt & Witkiewitz, 2002). Given the substantial economic and individual costs of substance abuse worldwide (WHO, 1999), it is critical for cost-effective, empirically supported treatments to be developed, evaluated, and disseminated internationally (Marsden, Ogborne, Farrell, & Rush, 2000). Cognitive-behavioral approaches to substance use have received considerable attention in the research literature, with many studies

demonstrating the efficacy and effectiveness of cognitive-behavioral treatments for a variety of addictive disorders across diverse populations (Carroll, 1996; Kadden, 2001; McCrady & Ziedonis, 2001). In this article we review existing cognitive-behavioral approaches to substance use disorders and introduce a novel cognitive-behavioral technique, mindfulness meditation, as an adjunct to existing treatments or as a stand-alone treatment of addictive disorders.

COGNITIVE BEHAVIORAL MODEL OF ADDICTION

Based on the premise that maladaptive drinking and drug use are learned behaviors, cognitive behavior therapy (CBT) provides a framework around which interventions attempt to identify situational, social, affective, and cognitive precipitants of pathological substance use. Once possible causes of maladaptive behavior are identified an individual may decide to reduce the quantity or frequency of substance use, or may decide to abstain from alcohol and drugs completely. Numerous studies have described the clinical and cost effectiveness of CBT in the promotion of abstinence rates, reduction of drinking quantity, frequency, and duration (Finney & Monahan, 1996; Kadden, 2001; Longabaugh & Morganstern, 1999), and prevention of relapse (Carroll, 1996; Irvin, Bowers, Dunn, & Wang, 1999).

CBT for alcohol and drug use disorders and the cognitive behavior (CB) model of alcohol and drug relapse was initially proposed by Marlatt and colleagues (Larimer, Palmer, & Marlatt, 1999; Marlatt & Gordon, 1985). As shown in Figure 1, the CB model of relapse is based on the linear progression of responses in high-risk situations. According to this model, if an effective coping strategy is used, then the individual will likely experience an increase in self-efficacy and is less likely to consume the previously desired substance. However, if an ineffective coping strategy is used, then self-efficacy may decline and/or outcome expectancies may become more positive leading to an increased likelihood of consumption. The initial use of a substance (a lapse) is then followed by the perceived effects of the substance and the attributions a person makes following a lapse. For example, if an individual views the lapse as a minor mistake or a learning opportunity, then he or she is more likely to return to the prelapse treatment goal (a prolapse). However, if an individual views the lapse as an uncontrollable, internal indication of failure, then the individual is more likely to progress to continued use of the substance

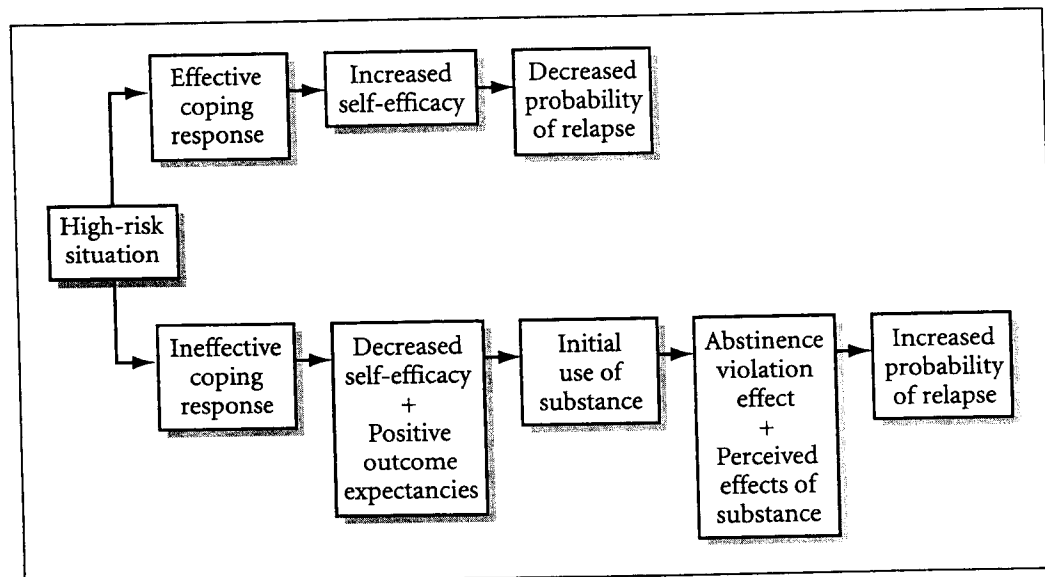


FIGURE 1. Cognitive-behavioral model of relapse.

(a relapse). The latter scenario has been described as the "abstinence violation effect" (Marlatt, 1985) whereby an individual views the lapse as an irreparable failure, an attitude that may lead to an increase in the undesired behavior.

Several variations of CBT have been developed based on the CB model of relapse. For a detailed overview, Kadden (2001) provides an extensive examination of the most successful cognitive and behavioral treatments for substance dependence, including cue exposure, contingency management, community reinforcement approaches, relapse prevention, behavioral marital therapy, and patient-treatment matching. In the treatment of drug addiction, contingency-management paired with community reinforcement approaches or relapse prevention approaches (Budney & Higgins, 1998; Epstein, Hawkins, Covi, Umbricht, & Preston, 2003), and relapse prevention combined with pharmacotherapy (Fiore, Smith, Jorenby, & Baker, 1994; Schmitz, Stotts, Rhoades, & Grabowski, 2001), are among the most successful treatments, particularly among individuals with co-occurring disorders. Borrowing the most successful components from each of these interventions and synthesizing the hypothesized mechanisms of change in CBT-type approaches (coping skills, craving, self-efficacy, motivation, and metacognitive awareness) we propose a new variation of CBT for alcohol and drug use disorders, called mindfulness-based relapse prevention (MBRP). For the remainder of this article we will review components of relapse prevention, the hypothesized mechanisms of change in CBT approaches, and provide a brief introduction to MBRP. We will conclude with a presentation of preliminary empirical data in support of mindfulness-based approaches to addictive disorders and recommendations for future research.

Relapse Prevention

The CB model of addiction forms the basis for relapse prevention, an intervention that attempts to describe, understand, prevent, and manage relapse in individuals who have received, or are receiving, treatment for substance use disorders. The relapse prevention model has provided an important heuristic and treatment framework for clinicians working with several types of addictive behavior (Carroll, 1996). Relapse prevention combines behavioral skill training with cognitive interventions designed to prevent or limit the occurrence of relapse episodes. Relapse prevention treatment begins with the assessment of the potential interpersonal, intrapersonal, environmental, and physiological risks for relapse and the factors or situations that may precipitate a relapse. Once potential relapse triggers and high-risk situations are identified, cognitive and behavioral approaches are implemented that incorporate both specific interventions and global self-management strategies.

The cornerstone of relapse prevention is the identification and modification of deficits in coping skills, the bolstering of self-efficacy and the challenging of positive outcome expectancies, and education about the abstinence violation effect. One of the major, and often overlooked, components of relapse prevention is the focus on lifestyle balance and relapse management techniques. An individual who is trying to maintain abstinence may be encouraged to pursue a "positive addiction" (Glasser, 1976), such as exercise, reading, or meditation. Relapse prevention training also tends to place a greater emphasis on alternative methods for coping with urges or temptations to use substances. For example, urge-surfing is a common technique, which incorporates both cognitive (imagery) and behavioral (relaxation) coping strategies.

Relapse prevention has become one of the most widely disseminated and successful adjuncts to treatment for addictive and nonaddictive disorders, including cocaine abuse (Schmitz et al., 2001), depression (Teasdale et al., 2000), eating disorders (Mitchell & Carr, 2000), erectile dysfunction (McCarthy, 2001), gambling (Echeburua, Fernandez-Montalvo, & Baez, 2000), bipolar disorders (Lam et al., 2000), marijuana dependence (Roffman, Stephens, Simpson, & Whitaker, 1990), schizophrenia (Herz et al., 2000), and sexual offenses (Laws, 1995). Two recent qualitative and quantitative reviews of relapse prevention have demonstrated the clinical effectiveness

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and efficacy of relapse prevention in the treatment of a variety of addictive disorders (Carroll, 1996; Irvin et al., 1999). In a qualitative review of studies on relapse prevention for smoking, alcohol, marijuana, and cocaine addiction, Carroll (1996) concluded that relapse prevention was more effective than no treatment and equally effective as other active treatments, such as nicotine gum (Killen, Maccoby, & Taylor, 1984), interactional and interpersonal therapies (Ito, Donovan, & Hall, 1988; Kadden, Cooney, Getter, & Litt, 1989), behavioral marital therapy (O'Farrell, Choquette, Cutter, Brown, & McCourt, 1993), social support group (Stephens, Roffman, & Simpson, 1994), and 12-step support groups (Wells, Peterson, Gaine, Hawkins, & Catalano, 1994). Several of the reviewed studies demonstrated that relapse prevention techniques significantly reduced the intensity of relapse episodes (Davis & Glaros, 1986; O'Malley et al., 1996; Supnick & Colletti, 1984), and several studies identified sustained main effects for relapse prevention.

Carroll (1996) hypothesized that relapse prevention may provide continued improvement over a longer period of time (indicating a "delayed emergence effect"), whereas other treatments may only be effective over a shorter duration (Carroll, Rounsaville, & Gawin, 1991; Carroll, Rounsaville, Nich, & Gordon, 1994; Goldstein, Niaura, Follick, & Abrahms, 1989; Hawkins, Catalano, Gillmore, & Wells, 1989; Messina, Farabee, & Rawson, 2003). For example, a recent study found cocaine-dependent individuals with antisocial personality disorder who were randomly assigned to a combined treatment of contingency-management and CBT had the highest abstinence rate (80%) at the 52-week follow-up and demonstrated the greatest increase in abstinence rates over the 17-, 26-, and 52-week follow-up assessments, as compared to contingency management only, CBT only, or methadone maintenance (MM) treatment groups. Similar trends were found in cocaine abusers without antisocial personality disorder. The CBT-only group demonstrated the greatest increases in abstinence rates at follow-up (33%, 64%, and 81%), as compared to the contingency-management (63%, 40%, and 44%), contingency-management + CBT (53%, 41%, and 49%), and methadone maintenance (31%, 72%, and 55%) groups (Messina, Farabee, & Rawson, 2003). The results from both groups (cocaine abusers with and without antisocial personality disorder) demonstrated greater long-term improvement up to 1 year following treatment in those who received CBT as compared to those who received either only contingency management or MM. The CBT intervention in this study was based on Marlatt and Gordon's (1985) seminal text on relapse prevention, thereby supporting the hypothesis that relapse prevention-type interventions may be more effective in the long term.

Irvin and colleagues (1999) conducted a meta-analytic review including 26 studies of treatment for alcohol, smoking, polysubstance, and cocaine use, representing a sample of 9,504 participants with addictive disorders. The results demonstrated that relapse prevention was a successful intervention for drug and alcohol use (overall treatment effect size: $r = .14$; alcohol treatment effect: $r = .37$; polysubstance treatment effect: $r = .27$; cocaine treatment effect $r = -.03$; smoking treatment effect: $r = .09$). Individuals who had received relapse prevention training were more likely to report better psychosocial outcomes (overall effect on psychosocial adjustment: $r = .48$), such as marital adjustment, increased social and problem-solving skills, and decreased levels of health, employment, and social impairment. The authors concluded that relapse prevention is an efficacious treatment, but cautioned that little is known about the moderators and mediators of relapse prevention's effectiveness. Specifically, very few studies have investigated the components of relapse prevention that are more influential than others or the differential effectiveness of relapse prevention across types of substances and treatment settings.

MECHANISMS OF CHANGE IN COGNITIVE-BEHAVIORAL TREATMENTS

Despite the widespread support for CBT as the preferred treatment for alcohol and drug use disorders, few studies have examined the underlying mechanisms of change in CBT (Morganstern & Longabaugh, 2000). For example, studies have consistently found a relationship between cop-

ing skills and treatment outcomes, but there is no consistent evidence that an increase in coping skills is the active ingredient in CBT (Morganstern & Longabaugh, 2000). Some of the possible mediators of CBT's effectiveness in the treatment of substance use disorders include behavioral mechanisms, such as contingencies and coping; and cognitive mechanisms, such as self-efficacy, craving, motivation, and nonspecific treatment effects (Litt, Kadden, Cooney, & Kabela, 2003).

Behavioral Mechanisms

As described above, contingencies play an immense role in the development and maintenance of substance use disorders. Based on an operant conditioning perspective, substance use is an operant behavior that is maintained by experiences that provide either reinforcement or punishment (Higgins & Petry, 1999). The presentation of a reward (positive reinforcement) or removal of an aversive stimulus (negative reinforcement) is a very powerful influence in the continuation of a given behavior. The biochemical effects of alcohol and drugs often provide both positive reinforcement (e.g., the euphoria associated with stimulant use) and negative reinforcement (e.g., the dampening of inhibitions associated with alcohol use). Substance use may also be associated with many negative consequences, including (but not limited to): loss of employment, financial troubles, family conflict, health and legal problems, and potential injury or death.

The balance between positive and negative contingencies may be a very powerful mechanism in the maintenance of substance use behavior. The reinforcement value of a particular contingency may also play an important role in the continuation or extinction of a certain behavior (Bolles, 1972). For example, if an individual is required to take weekly drug tests as a condition of parole and a positive test demands reincarceration, the individual is much less likely to use drugs. If the person's use does not incur negative external contingencies (e.g., peers support use, there is no financial strain, and he or she is able to maintain a good paying job), then the drug use is likely to continue (Silverman et al., 2002).

Based on the CB model of relapse, the most critical predictor of relapse is the individual's ability to utilize effective coping strategies in dealing with high-risk situations. Coping is defined as a cognitive or behavioral strategy designed to reduce danger or achieve gratification in a given situation (Lazarus, 1966). Several types of coping have been proposed, which differ by function and topography. Shiffman (1984) described the distinctions between *stress coping*, which functions to diminish the impact of stressors, and *temptation coping*, which is intended to resist temptation to use independent from stress; either stress or temptation coping can take the form of *cognitive coping*, using mental processes and "willpower" to control behavior, and *behavioral coping*, which involves some form of action. An example of cognitive temptation coping is thinking about the negative consequences of using, whereas behavioral temptation coping may be the active avoidance of drug cues to prevent use. Cognitive stress coping might include weighing the pros and cons of responding to a stressful situation while using versus not using, and behavioral stress coping might be going for a walk to get out of a stressful situation, such as a family quarrel.

Moos (1993) highlighted the distinction between approach and avoidance coping. Approach coping may involve attempts to accept, confront, or reframe as a means of coping, whereas avoidance coping may include distraction from cues or engaging in other activities. Gossop and colleagues (2002) found that patients who used more cognitive avoidance and distraction coping strategies (e.g., avoiding heroin-related cues, staying away from friends who continue to use heroin) had lower rates of relapse to heroin use. Chung and colleagues (2001) defined cognitive avoidance as "wishful thinking," or attempts to avoid realistic thinking about a stressor. They found that decreased cognitive avoidance and increased behavioral approach coping (e.g., "taking action," asking for help from others) predicted improved alcohol treatment outcomes. The seemingly discrepant relationship between "cognitive avoidance" coping and outcomes in the two

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studies by Chung and colleagues (2001) and Gossop and colleagues (2002) highlights the need for the field of addictive behaviors to develop clear, consistent operational definitions of coping behavior (Schwartz, Neale, Marco, Shiffman, & Stone, 1999).

Marlatt (2002) proposed a type of coping based on the Buddhist notion of "skillful means" (or right conduct). As applied to addictive behavior, cognitive skillful means is the "act of inaction," being in the moment, observing, and accepting, without analyzing, judging, or reacting. With the example of urges, Marlatt (2002) provides an illustration of cognitive skillful means: "Giving in to the urge when it peaks only serves to further reinforce the addictive behavior. Not acting on the urge, on the other hand, weakens the addictive conditioning and strengthens acceptance and self-efficacy" (p. 47). In this situation, the coping skill being used is the nonreaction to a cognitive urge.

Interestingly, coping skills training and other CBT-type approaches that target coping skill development have not been shown to be necessary for increased coping strategies following treatment (Finney, Noyes, Coutts, & Moos, 1998; Litt, Kadden, Cooney, & Kabela, 2003; Morganstern & Longabaugh, 2000). Litt and colleagues demonstrated that both CBT and interactional group therapy led to decreased alcohol consumption up to 18 months following treatment and there were no significant differences between treatments on measures of coping at follow-up. Finney and colleagues (1998) compared CBT to 12-step interventions and found that the CBT approach was not associated with specific change mechanisms consistent with CBT-type interventions. Increases in coping skills were produced by 12-step approaches to the same extent as changes produced by CBT. In an extensive review by Morganstern and Longabaugh (2000), the authors concluded that the effectiveness of CBT in the treatment of alcohol dependence is not uniquely mediated by changes in coping skills, one of the main targets in CBT. Rather, consistent with Finney and colleagues (1998) and Litt and colleagues (2003), other active treatments for substance abuse besides CBT may also result in the acquisition or improved use of cognitive-behavioral coping strategies.

Unfortunately, in their review, Morganstern and Longabaugh (2000) neglected to consider the importance of other CB concepts that may be important in the process of change (Buhringer, 2000). The complexity inherent in the process of behavior change makes it difficult to tease out the relationship between mechanisms and outcomes, and the aggregation of outcomes across individuals and studies makes it nearly impossible to identify universal change mechanisms. Let us not throw out the baby with the proverbial bathwater; as stated by Buhringer (2000) "the Morganstern & Longabaugh analysis is not a failure in terms of supporting the mechanisms of CBT action but a piece in a mosaic of many studies to analyze as well as improve the mechanisms of CBT" (p. 1716).

Cognitive Mechanisms

Urges, the intention or impulse to consume alcohol or drugs, are distinct from craving, the subjective desire to experience an addictive substance (Larimer et al., 1999). However, both urges and craving are cognitive mediators of substance use in individuals who are trying to abstain from substances. "Craving," "temptations," and "urges" may all be described as cognitive representations of the desire to use a substance. These cognitions are often highly correlated with self-reported symptoms of withdrawal, affective states, and outcome expectancies (Drummond, Litten, Lowman, & Hunt, 2000).

The recognition of craving as a cognitive mechanism, rather than a physiological response, is an important clarification with repercussions for treatment and treatment responding. Consistent with Tiffany's cognitive-processing theory (Tiffany, 1990; Tiffany & Conklin, 2000), we propose that "craving" is a cognitive response with stimulus properties. It may be a response to nonautomatic processes (Tiffany & Conklin, 2000), environmental cues (Ludwig & Wikler,

1974), withdrawal (Piasecki et al., 2000), negative affect (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004), expectancies (Niaura, 2000), perceived availability of the substance (Wertz & Sayette, 2001), or neuroadaptations for substances and substance cues (Robinson & Berridge, 2000). Regardless of the stimulus, the end product is the subjective experience of craving, which is amenable to treatment intervention. Beck (1976) established a method for restructuring maladaptive thoughts, which led to a decrease in depressive mood states. Similarly, addiction treatment providers can help their clients restructure or accept maladaptive cravings to decrease alcohol- and/or drug-seeking behaviors.

The success experienced through restructuring craving experiences may be highly related to an individual's perceived self-efficacy. In the treatment of addictive behavior many clinicians and researchers have focused on the importance of situation-specific self-efficacy in the prediction of substance use following treatment (e.g., Gwaltney et al., 2001; Haggga, 1990; Marlatt & Gordon, 1985; Sklar, Annis, & Turner, 1999). For example, Haggga (1990) suggested the existence of an "Achilles' heel," where the prediction of outcome is dependent on the lowest context-specific rating of self-efficacy. Gwaltney and colleagues (2002) used ecological momentary assessment (EMA; Stone & Shiffman, 1994) to assess abstinence self-efficacy in real time. Six situational factors were identified: negative and positive affect, restrictive situations, idle time, social/food, and low arousal, which were then used to create lapse profiles. Results consistently demonstrated that situational self-efficacy was significantly related to smoking lapses and craving in the matched situation (e.g., participants with low social/food self-efficacy were most likely to experience craving and subsequent lapses when they were in social or food-related situations). It follows that treatment providers should continue to focus on the importance of enhancing self-efficacy.

Craving and self-efficacy are often highly correlated with a third cognitive mechanism of substance use, motivation. Cox and Klinger (1988) proposed that the "common, final pathway to alcohol use is motivational." This idea was inherently tied to the idea of positive expectations for the effects of alcohol and drug use, but it also stimulated the notion that motivation for drinking was a key mechanism in predicting behavior change. Motivation may relate to substance use and relapse in two distinct ways, the motivation for positive behavior change and the motivation to engage in the problematic behavior. The Oxford English Dictionary (OED; Oxford University Press, 2002) defines motivation as "the conscious or unconscious stimulus for action towards a desired goal provided by psychological or social factors; that which gives purpose or direction to behavior." Using the example of tobacco use we could define the first type of motivation (*motivation to change*), as the stimulus for action towards abstinence or reduced use of tobacco, and the second type of motivation (*motivation to use*), as the stimulus for smoking. The enhancement of motivation to change and the reduction in motivation to use throughout treatment for substance abuse is highly predictive of treatment outcome, regardless of specific treatment techniques (e.g., CBT, motivation enhancement, 12-step approaches) (DiClemente, Carbonari, Zweben, Morrel, & Lee, 2001; Project MATCH Research Group, 1997).

Wilson and Vitousek (1999) noted that the self-monitoring component of CBT interventions is a critical mechanism of change. Self-monitoring often leads to an increased awareness of the problem behavior and an increase in self-regulatory skills (Bandura, 1977). Similarly, CBT process research has shown that the self-reported experiences of introspection, catharsis, increased insight, and achieving acceptance are related to positive outcomes in the treatment of depression (Ablon & Jones, 1999). These constructs all have been associated with the concepts of "skillful means" (Marlatt, 2002), "being mind" (Segal, Williams, & Teasdale, 2002), and "wise mind" (Linehan, 1993). Hufford and colleagues (2002) demonstrated that self-monitoring alone may not be enough to activate self-regulatory skills that alter the monitored behavior. This suggests the existence of a core construct that ties increased attention to a behavior and the systematic change of that behavior. One possible underlying premise of these constructs is a focus on the present moment, with acceptance and nonjudgmental understanding.

Mindfulness meditation, a metacognitive skill learned through meditation practice, may serve to further enhance CBT interventions for problematic substance use behavior (Marlatt, 2002). Breslin, Zack, and McMMain (2002) state that while the use of meditation to reduce alcohol consumption is not new (Marlatt & Marques, 1977), research on substance use and meditation includes only a few studies, most of which are not scientifically rigorous. Research on mindfulness-based treatment of chronic pain disorders (Kabat-Zinn, 1990) and mindfulness-based psychotherapy for depression (Segal et al., 2002) suggests that traditional CB treatments of these disorders can be enhanced using mindfulness-meditation techniques.

MEDITATION AS AN OLD AND NEW APPROACH TO ADDICTION TREATMENT

Recently there has been a resurgence of meditation research in the field of addictions (Breslin et al., 2002; O'Connell & Alexander, 1994). The first studies on meditation and substance abuse came from practitioners of the transcendental meditation (TM) technique (Benson, 1975; Marcus, 1974). Promising results from these basic survey studies led Marlatt and Marques (1977) to begin using meditation as an intervention for high-risk drinkers. The success of the intervention led Marlatt and colleagues (1984) to conduct a randomized trial of three relaxation techniques (TM, deep muscle relaxation, and daily quiet recreational reading), in heavy-drinking college students. All three groups reported significant reductions in alcohol consumption, and those in the TM group reported the most consistent reductions in alcohol use. In a second randomized trial with college students, meditation and exercise were equally effective in reducing daily alcohol consumption, and both groups reduced their drinking significantly more than a no-treatment control group (Murphy, Pagano, & Marlatt, 1986). These findings are consistent with the concept of exercise and meditation as examples of "positive addictions" (Glasser, 1976).

The application of meditation as an intervention for psychological disorders is not unique to the treatment of addictions (Baer, 2003). Kabat-Zinn (1990) developed mindfulness-based stress reduction, Linehan (1993) integrated mindfulness into her revolutionary treatment, dialectical behavior therapy for borderline personality disorder, and Hayes and colleagues (1999) utilized mindfulness techniques in their acceptance and commitment therapy. More recently, mindfulness-based cognitive therapy (Segal, Williams, & Teasdale, 2002) has been developed as a relapse prevention treatment for depression. Others have incorporated techniques consistent with mindfulness meditation into existing treatments for generalized anxiety disorder (Borkovec, Alcaine, & Behar, 2004; Roemer & Orsillo, 2002) and posttraumatic stress disorder (Orsillo & Batten, 2005).

There is substantial research indicating mindfulness meditation is effective in the reduction of chronic pain (Kabat-Zinn, 1990), anxiety (Kabat-Zinn et al., 1992), and in preventing depressive relapse (Segal et al., 2002). Kabat-Zinn's (1990) intervention for chronic pain problems, mindfulness-based stress reduction consists of eight weekly group sessions lasting 2 to 3 hours plus a weekend "retreat" toward the end of the program that offers a more sustained opportunity to practice meditation. Mindfulness-based stress reduction, adapted from the Buddhist practice of Vipassana meditation (Goldstein, 1976), teaches mindfulness meditation including the "body scan" and sitting meditation, Hatha Yoga, and coping skills similar to those used in cognitive-behavioral therapy.

Following the program developed by Kabat-Zinn, Segal and colleagues developed mindfulness-based cognitive therapy for depression (Segal et al., 2002; Teasdale et al., 2000). In one prospective study (Teasdale et al., 2002), 145 patients in remission from major depression were randomly assigned to a mindfulness-based cognitive therapy group or to a treatment-as-usual control condition. In mindfulness-based cognitive therapy, patients were taught to be more aware of negative thoughts and their association with unpleasant sensations and painful

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feelings that can precipitate a depressive episode. Patients in the mindfulness-based cognitive therapy group with a history of three or more major depressive episodes reduced their risk of depressive relapse by half of the reported relapses in the treatment-as-usual control group, with changes maintained over a 60-month follow-up period.

Despite the diverse clinical applications of meditation-type interventions and profusion of research evaluating the effectiveness of mindfulness techniques, the mechanism of mindfulness meditation in the treatment of psychological disorders remains unknown (Roemer & Orsillo, 2002). Some have characterized mindfulness as a behavioral technique, analogous to exposure (Foa & Rothbaum, 1998; Linehan, 1993), behavioral activation (e.g., "pleasant events," Segal et al., 2002), and behavioral flexibility (Hayes et al., 1999). Others have described mindfulness as a cognitive skill (Langer, 1998), requiring attention to the present moment (Borkovec et al., 2004). Teasdale and colleagues (1995) described mindfulness as "attentional control," a meta-cognitive state of detached awareness, which changes a person's relationship to their thoughts. Traditional cognitive therapy techniques attempt to change the *content* of thoughts (e.g., challenge maladaptive thoughts), whereas mindfulness techniques attempt to change a person's *attitude* toward their thoughts, feelings, and sensations.

The evidence suggests that greater mindfulness is related to improved treatment outcomes, but is there empirical support for the hypothesis that increasing mindfulness skills literally changes attentional control and a person's relationship to their thoughts? Recent neurobiological and psychophysiological studies have demonstrated changes in neurotransmitter levels (Infante et al., 2001; Kjaer et al., 2002), brain wave activity (Dunn, Hartigan, & Mikulas, 1999; Fargoso, Grinberg, Perez, Ortiz, & Loyo, 1999), activation of neural structures (Lazar et al., 2000), and cerebral blood flow (Newberg et al., 2002). Kjaer and colleagues (2002) found increased dopamine release during meditation, which was strongly associated with a reduced desire for action. Using functional magnetic resonance imaging, Lazar and colleagues (2000) concluded that meditation practice leads to the activation of neural structures (dorsolateral prefrontal and parietal cortices, hippocampal regions, temporal lobe, anterior cingulate cortex, striatum, and precentral and postcentral gyri), which are involved in attention and the functioning of the autonomic nervous system. Many of the findings from these studies suggest that meditation results in neurological changes that are associated with increased levels of alertness, relaxation, attentional control, and reduced readiness for action. Kjaer and colleagues (2002) summarize these findings by describing: "The meditator [as] a neutral observer. He experiences loss of conscious control of his actions and experiences an enhancement of sensory stimulations or imagination" (p. 255).

Mindfulness and Addiction

The neurobiological findings support the hypothesis that meditation enhances awareness and the cultivation of alternatives to mindless, compulsive behavior (Marlatt, 2002). As stated by Groves and Farmer (1994), "In the context of addictions, mindfulness might mean becoming aware of triggers for craving . . . and choosing to do something else which might ameliorate or prevent craving, so weakening the habitual response" (p. 189). As described above, craving is seen as a cognitive response with stimulus properties. Based on this conceptualization, the craving responses that are common in addiction create a complex system composed of environmental cues and rigid cognitive responding (subjective experience of craving), positive outcome expectancies for the desired effects of the substance and/or motivation for engaging in the addictive behavior subsequent reductions in negative affect or withdrawal symptoms may provide positive and negative reinforcement for the initiation or continued use of substances. Mindfulness meditation may disrupt this system by providing heightened awareness and acceptance of the initial craving response; without judging, analyzing, or reacting. By interrupting this system, meditation acts as a form of counterconditioning, in which a state of metacognitive awareness and relaxation replaces the positive and negative

reinforcement previously associated with engaging in the addictive behavior. In this sense, mindfulness may serve as an alternative addiction; more than just a coping strategy for dealing with urges and temptations, but rather as a gratifying replacement behavior. Increased mindfulness may also reduce an individual's susceptibility to act in response to a drug cue or cue stimulus, and decrease an individual's inclination to behave impulsively.

Preliminary Data on the Effectiveness of Vipassana Meditation

Recently, the Addictive Behaviors Research Center at the University of Washington has undertaken a unique study on the use of meditation as a stand-alone treatment for alcohol and drug problems. Inmates ($n = 306$), many of whom were heavy alcohol and substance abusers prior to incarceration, were recruited from a minimal security rehabilitation facility (North Rehabilitation Facility [NRF], Seattle) to participate in a 10-day Vipassana meditation course. Vipassana meditation is rooted in traditional Buddhist teachings and has been made available to individuals around the world by the revered Buddhist master, S. N. Goenka (Hart, 1987). The course consists of a series of hour-long discourses covering basic Buddhist principles, including the "Four Noble Truths" associated with the cause and cure of human suffering and the identification of "the self" as a separate autonomous being as an illusion. Meditation is described as a method of going beyond the self ("small mind") and moving toward the "Big Mind" of spiritual enlightenment.

All inmates residing at NRF within 1 week prior to a Vipassana course were recruited by research staff to participate in a study on the effects of Vipassana meditation and other rehabilitation programs on alcohol and drug use, alcohol and drug-related consequences, psychological functioning, spirituality, and criminal behavior. Inmates who did not want to participate in the course were recruited to serve as "treatment as usual" control participants, who received no meditation treatment but who were permitted to attend other rehabilitation courses (e.g., psychoeducation, Alcoholics Anonymous, social skills training). In both groups the attrition rate was high, with 218 of those inmates initially recruited to take part in the study not completing all assessments. Unfortunately, inadequate recordkeeping prevents us from determining the reasons some participants ($n = 88$; Vipassana 24%, control 76%) did not complete the study. A majority of the participants who did not complete the assessments ($n = 95$; Vipassana 18%, control 82%) were ineligible for participation past the baseline assessment. The known reasons for not completing the study include: release from NRF prior to postcourse evaluation ($n = 22$; Vipassana 32%, control 68%), refusal to continue in the study ($n = 9$; Vipassana 33%, control 67%), reincarceration at another facility ($n = 3$; Vipassana 33%, control 67%), and escape from NRF ($n = 1$; 100% control). Independent sample t tests and chi-square analyses showed no significant differences ($\alpha = .05$) between those who completed the study and those who dropped on measures of age, gender, ethnicity, psychiatric symptoms, frequency of alcohol use, or level of education. The final sample consisted of 29 participants in the Vipassana meditation course and 59 participants in the control group. All inmates at NRF were encouraged to attend psychoeducational programs (including relapse and recidivism prevention education), which were standard courses offered at the facility. Participants in the Vipassana course had accumulated more NRF program hours ($M = 49.9$ hours of programming), prior to taking the Vipassana course, than the control group ($M = 31.6$ hours of programming), but this difference was not statistically significant ($t(85) = -1.82, p = .07$).

The following is a brief summary of preliminary results from the full sample of Vipassana and control participants who completed the precourse and a follow-up assessment that occurred following the release from prison. We hypothesized that the Vipassana participants would have better outcomes at 3 months than the control participants, but that, given the treatment-orientation of NRF, the control participants would also improve from precourse to the 3-month assessment.

this sense, mind-dealing with urges and mindfulness may also reduce stress, and decrease

ington has undergone for alcohol and substance abusers in a 12-week meditation course. This course was made available to participants (Hart, 1987). The course includes principles, including mindfulness and the identification of "Mind" of spir-

Participants were recruited by telephone and other rehabilitation centers, psychological services, and community centers. Participants who received no medication (e.g., psychoeducation) had a high relapse rate. Completing all assessment sessions was a goal. The reasons for not completing all sessions were: control 82% (n = 22); Vipassana 67% (n = 19); and control 67% (n = 19). There were no significant differences on measures of relapse by level of education. There were 59 participants in the psychoeducational course and 59 participants in the standard course. There were more NRF participants in the course, than the control group. Statistically signif-

Participants in the Vipassana course had a significantly lower relapse rate than occurred in the control group. Participants who had treatment-oriented to the 3-month

These preliminary data demonstrated that both groups made large improvements in frequency and quantity of drinking, with a tendency for the Vipassana group to report greater reductions than the control group. For example, within the Vipassana group, 47.2% of the sample was drinking more than 4 times a week in the 90 days prior to the baseline assessment, and only 17.9% of the sample was drinking more than 4 times a week at the 3-month follow-up. In the control group the prevalence of those drinking 4 times per week or more was reduced from 40.7% at baseline to 26.8% at the 3-month follow-up. Likewise, the Vipassana group reduced the number of drinks on a typical drinking day, with 39.6% of the sample drinking seven or more at baseline and only 21.5% of the sample drinking seven or more at follow-up. The control group slightly increased their drinking with 30.5% of the sample drinking seven or more at baseline to 30.7% of the sample drinking seven or more at follow-up.

To test our hypotheses we evaluated the main univariate effects for time within each treatment group, we then used repeated measures analyses of variance to evaluate the time by treatment group interaction. Due to the large number of analyses and multiple dependent variables, we recognize a heightened risk for making Type I errors. To correct for this we used a corrected alpha level ($\alpha < .01$) for evaluating the main effects. We provide the actual *p* values for the time by treatment interactions.

Table 1 provides the means and standard deviations for each treatment group on several dependent measures at precourse and 3-month follow-up. Repeated measure analyses of variance evaluating the differences in the means from the precourse assessment to the 3-month follow-up indicated the Vipassana group demonstrated significant improvements on the Drug Abuse Severity Test (Skinner, 1982), average number of drinks per week (Addiction Severity Index; McLellan, Luborsky, O'Brien & Woody, 1980), average marijuana, powder cocaine, and crack cocaine use per week (Addiction Severity Index; McLellan et al., 1980), drinking-related locus of control (DRIE; Donovan & O'Leary, 1978), drinking-related consequences (as measured by the Short Inventory of Problems, Miller & Longabaugh, 1995), optimism (Life Orientation Test; Scheier & Carver, 1985), and thought suppression (White Bear Suppression Inventory; Wegner & Zanakos, 1994). The control group also demonstrated significant improvements in average marijuana use per week (Miller & Marlatt, 1984) and thought suppression (White Bear Suppression Inventory; Wegner & Zanakos). Significant time by treatment interactions over the 3-month period demonstrated the marked improvement of the Vipassana group, above and beyond the improvements in the control group, on the drug abuse severity test (DAST; Skinner, 1982), average weekly drug use, including peak weekly marijuana and powder cocaine use (Addiction Severity Index; McLellan et al., 1980), and optimism (LOT; Scheier & Carver, 1985).

The results from the study reported in this article are preliminary. Currently we are extending this study to include nonincarcerated individuals taking Vipassana courses in Washington, California, Massachusetts, and Illinois. We hope to continue building this research program by conducting a randomized controlled trial comparing three experimental groups: no-treatment wait-list control, brief intervention CBT, and relapse prevention combined with mindfulness training.

THE BEST OF TWO WORLDS: INTRODUCING MINDFULNESS-BASED RELAPSE PREVENTION

Integrating over 2 decades of research on relapse prevention as a treatment for substance dependence, with existing mindfulness-based techniques (Kabat-Zinn, 1990; Segal et al., 2002), we propose a "new" cognitive-behavioral intervention for substance use disorders, called mindfulness-based relapse prevention. The goal of this relapse prevention is to develop awareness and acceptance of thoughts, feelings, and sensations through practicing mindfulness; and to utilize these mindfulness skills as an effective coping strategy in the face of high-risk situations. Education about craving and instruction on the application of mindfulness skills to the

TABLE 1. PRELIMINARY RESULTS EVALUATING VIPASSANA MEDITATION COURSE AT THE NORTH REHABILITATION FACILITY

Measure	Vipassana		Control		F(df) ^c
	Precourse	3-Month	Precourse	3-Month	
Short Inventory of Problems Total Score (Miller, Tonigan, & Longabaugh, 1995)	1.35 (1.05)	0.59 (0.82)	1.28 (1.00)	0.93 (1.01)	F(1, 78) = 3.74, p = .06
Alcohol Dependence Severity (Skinner & Horn, 1984)	0.61 (0.49)	0.51 (0.54)	0.54 (0.44)	0.53 (0.44)	F(1, 78) = 1.95, p = .17
Depression (Brief Symptom Inventory, Derogatis & Melisaratos, 1983)	1.07(0.90)	0.53 (0.62)	0.98 (0.84)	0.88 (0.74)	F(1, 80) = 5.00, p = .03
Drug Abuse Severity Test (Skinner, 1982)	15.52 (8.77)	9.74 (7.58) ^b	15.02 (7.81)	13.71 (8.96)	F(1, 73) = 6.76, p = .01
# drinks ^a	54.85 (56.54)	8.63 (13.78) ^b	49.77 (63.45)	29.60 (46.53)	F(1, 77) = 3.15, p = .08
Marijuana use days ^a	0.38 (0.44)	0.03 (0.44) ^b	0.30 (0.41)	0.16 (0.33) ^b	F(1, 78) = 5.52, p = .02
Powder cocaine days ^a	0.19 (0.34)	0.02 (0.06) ^b	0.09 (0.20)	0.08 (0.23)	F(1, 78) = 5.50, p = .02
Crack cocaine days ^a	0.38 (0.48)	0.07 (0.20)	0.34 (0.43)	0.23 (0.37)	F(1, 78) = 4.39, p = .04
Drinking-related Internal and External Locus of Control Scale; Donovan & O'Leary, 1978	0.26 (0.18)	0.14 (0.14) ^b	0.25 (0.20)	0.23 (0.20)	F(1, 79) = 4.17, p = .05
Optimism (Life Orientation Test; Scheier & Carver, 1985)	2.22 (0.50)	2.63 (0.58) ^b	2.42 (0.58)	2.34 (0.61)	F(1, 78) = 15.16, p < .0005
Thought Suppression (White Bear Thought Suppression Inventory; Wegner & Zanakos, 1994)	53.04 (12.81)	2.98 (0.81) ^b	47.89 (15.45)	3.14 (1.07) ^b	F(1, 78) = 2.52, p = .116

Note. ^aAverage use per week as measured by the Addiction Severity Index (McLellan, Luborsky, O'Brien, & Woody, 1980). ^bMain effect for treatment group, p < .01; ^cTime by treatment interaction.

experience of craving is an essential tool in promoting awareness and acceptance of psychological and physiological reactions to substance withdrawal. Specific relapse prevention strategies (teaching effective coping skills, enhancing self-efficacy, challenging positive outcome expectancies, educating about the abstinence violation effect) in conjunction with the client instituting a regular mindfulness practice, provides an opportunity for the client to form an association between being mindful with the implementation of relapse prevention skills.

The identification of high-risk situations for relapse remains a central component of the treatment. Clients are trained to develop a system for recognizing early warning signs for relapse and increasing awareness of substance-related cues, such as people and places that have previously been associated with substance use. The addition of mindfulness provides clients with a new way of processing situational cues and monitoring one's reaction to environmental contingencies. Clients are taught to observe pleasant and unpleasant sensations, thoughts or feelings, and they are encouraged to accept them without judgment. A major element of the mindfulness training involves teaching clients to direct their attention to the breath in order to calm and focus the mind. Linehan (1993) describes this aspect of mindfulness as "wise mind." Ultimately, the heightened awareness and acceptance of thoughts and sensations in high-risk situations will result in more adaptive ways of responding to situational cues and a decreased probability of relapse. Repeated exposure to being mindful in high-risk situations without giving into the temptation to engage in substance use or acting impulsively in the presence of substance-related cues will lead to increased self-efficacy and the counterconditioning of the positive and negative reinforcement previously associated with the effects of an addictive substance.

Challenging positive outcome expectancies and educating about the abstinence violation effect remain a major focus of the treatment once the individual has reached their treatment goal. Within the context of mindfulness, clients are encouraged to maintain their focus and awareness on the present moment; thereby letting go of past events (e.g., a violation of abstinence) and not living toward, or making decisions based on, future events (e.g., the expectancy of euphoria after consuming a substance). In addition, praising clients for their efforts, validating the challenge of mindfulness practice, and recognizing small steps toward positive change will help build client self-efficacy.

DISCUSSION

In the past 10 years, mindfulness-based approaches have received considerable attention in the empirical literature and popular press, although the core of these approaches dates back to the ancient practice of Buddhist meditation. We believe that the synthesis of relapse prevention and mindfulness meditation techniques as a treatment for addictive behaviors will provide a more robust and durable treatment. Preliminary data provides initial support for the effectiveness of one type of mindfulness practice in reducing alcohol and drug use, and substance use-related problems, however future studies will need to evaluate the efficacy and effectiveness of mindfulness-based relapse prevention as a treatment for addictive disorders. Likewise, investigations on the mechanisms of action in mindfulness-based relapse prevention may be carried out by comparing relapse prevention, relapse prevention + mindfulness (mindfulness-based relapse prevention), and mindfulness-only in a randomized controlled trial. The addition of mindfulness-based techniques may ease the arduous process of behavior change and serve as an effectual adjunct to existing treatments.

To the extent that mindfulness-based interventions are equally effective as other empirically validated approaches (e.g., CBT, contingency-management, motivation enhancement, 12-step facilitation) mindfulness meditation may provide an alternative to these more cost-prohibitive treatments. Meditation is inexpensive (i.e., Vipassana courses are free), widely accessible, and possibly more acceptable than more Western forms of treatment. The process of

incorporating a mindfulness practice and learning to accept and tolerate urges is comparable to the process of building a repertoire of coping skills within relapse prevention therapy. Both techniques require practice and continued learning, whereby people develop their skills through a succession of lapses followed by prolapse. The use of mindfulness skills may ease this learning curve and enhance long-term success, providing support for the old adage that "slow and steady wins the race."

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