Mindfulness and Modification Therapy for Behavioral Dysregulation: Results From a Pilot Study Targeting Alcohol Use and Aggression in Women

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Objectives: Increasing evidence suggests that deficits in mindfulness (awareness, attentiveness, and acceptance of the present moment) play a role in a range of disorders involving behavioral dysregulation. This paper adds to that literature by describing a transdiagnostic psychotherapy (Mindfulness & Modification Therapy; MMT) developed to target behavioral dysregulation. *Design:* An open-treatment pilot-trial investigated the feasibility, acceptability, and pre-post effects of MMT targeting women (*N*=14) court-referred for alcohol abuse/dependence and aggression. *Results:* Pre-post comparisons revealed significant decreases in alcohol use, drug use, and aggression. In addition, the retention rate was 93%. *Conclusion:* Preliminary evidence suggests that MMT is a feasible and acceptable treatment that decreases dysregulated behaviors such as substance use and aggression, while also potentially increasing retention. © 2011 Wiley Periodicals, Inc. J Clin Psychol 68:50–66, 2012.

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Behavioral dysregulation is characterized by difficulty inhibiting harmful behavior (e.g., substance abuse, aggression, binge eating), which can lead to marked impairments in social, physical, and occupational functioning (see Mezzich et al., 1997). Although disorder-specific interventions have been developed for a range of dysregulated behaviors, treatment outcomes remain less than optimal, and relapse rates are often greater than 50% across disorders (McFarlane, Olmsted, & Trottier, 2008; McLellan, Lewis, O'Brien, & Kleber, 2000; Miller, Walters, & Bennett, 2001). In addition, individuals with one area of dysregulated behavior often also have another (e.g., alcohol abuse and gambling; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2001) and/or tend to begin another once the previous behavior is addressed (e.g., someone quits smoking but begins overeating; Manley & Boland, 1983); however, disorder-specific interventions are highly limited in their ability to address such co-occurrence.

Given that mindfulness deficits play a role in a range of disorders involving behavioral dysregulation (see below), the effectiveness of treatments for behavioral dysregulation might be improved by a transdiagnostic treatment that includes a focus on mindfulness. Mindfulness is a mental state that involves awareness, attentiveness, and acceptance of the present moment, without over-involvement in cognitive or emotional reactions (Kabat-Zinn, 1982). Mindfulness levels are inversely associated with self-reports of physical and verbal aggression

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(Borders, Earleywine, & Jajodia, 2010; Singh et al., 2007), disordered eating (Lavender, Jardin, & Anderson, 2009), gambling (Lakey, Campbell, Brown, & Goodie, 2007), self-injury (Lundh, Karim, & Quilisch, 2007), hazardous drinking (DiNapolini & Wupperman, in preparation), and impulsivity (Brown & Ryan, 2003). In addition, increased mindfulness predicts decreases in the reported use of dysregulated behaviors in attempts to modify emotions elicited by distressing situations (Wupperman, Neumann, & Axelrod, 2008; Wupperman, Neumann, Whitman, & Axelrod, 2009); this relationship is found in both clinical and community samples. Finally, mindfulness is inversely correlated with interpersonal conflict and negative emotions (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007; Brown & Ryan), which are risk factors for a range of dysregulated behaviors (Anestis et al., 2010; Brown, Linehan, Comtois, Murray, & Chapman, 2009; Chen, Brown, Harned, & Linehan, 2009).

Further evidence for the role of mindfulness deficits in behavioral dysregulation comes from research on treatments with a mindfulness focus. Mindfulness is a component of treatments that have shown promise for substance use (Bowen et al., 2009), eating disorders (see Kristeller, Baer, & Quillian-Wolever, 2006), gambling (Toneatto, Vettese, & Nguyen, 2007), aggression in relationships (Singh et al., 2007; Wachs & Cordova, 2007), and self-injury and suicidality (Gratz & Gunderson, 2006: Linehan, 1993). Thus, difficulties with mindfulness appear common among a variety of dysregulated behaviors.

Of note is that *dysregulated behaviors* are often called *impulsive* or *addictive behaviors* (Bowen et al., 2009; Selby et al., 2010). However, some dysregulated behaviors can occur after hours of rumination and planning (e.g., binge eating; Raymond et al., 1999), and some do not fit the standard model of addictions (e.g., violence). Thus, we have elected to use the term dysregulated behavior (e.g., Selby et al., 2010).

How Might Mindfulness Deficits Play a Role in Dysregulated Behaviors?

One of the most prominent clinical factors in dysregulated behavior is difficulty coping with negative affect (Anestis et al., 2010), to the extent that several researchers conceptualize dysregulated behaviors as attempts to regulate or avoid negative emotions (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004; Berking et al., in press; Cooper, Frone, Russell, & Mudar, 1995). Individuals who have difficulties being attentive to and aware of current emotions, thoughts, and sensations (i.e., mindfulness deficits) are likely to have particular difficulties experiencing emotions, thoughts, and sensations that have the potential to be unpleasant. However, one must experience a distressing stimulus before one can habituate to it (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), and chronic avoidance often leads to the continuation and escalation of distress (Hayes, Beevers, Feldman, Laurenceau, & Perlman, 2005). In addition, when individuals with mindfulness deficits are unable to avoid, they might feel the need to exert extreme efforts to suppress the experience, increasing the potential for harmful dysregulated behaviors (Chapman, Specht, & Cellucci, 2005; Wupperman et al., 2009). Given that these behaviors tend to provide short-term relief (Michel, Valach, & Waeber, 1994), they are negatively reinforced and have an increased likelihood of recurring, until they might eventually become automatic reactions to any signs of discomfort.

An intervention targeting mindfulness might address this cycle in a number of ways. First, mindfulness practice increases awareness, attention, and acceptance of ongoing experience, thus fostering emotional processing and habituation to negative emotions and urges (Teasdale et al., 2002; Teasdale, Segal, & Williams, 1995). Second, mindfulness facilitates *decentering*, or the capacity to step back mentally from automatic thoughts/reactions to respond more flexibly (Teasdale et al., 2002). Thus, an individual can become aware of urges to engage in a behavior and view that behavior as *one* response option, as opposed to the only option. Third, mindfulness might foster recognition of early signs of increasing negative arousal, thus allowing the use of skills learned during treatment when emotions and urges are at more manageable levels (Bowen et al., 2009). Fourth, if a lapse does occur, mindfulness might help individuals tolerate and release the guilt and shame that is predictive of a more severe relapse (Parks, Anderson, & Marlatt, 2001). Finally, evidence suggests that mindfulness might be

associated with enhancements in neural pathways involved in behavior regulation (Creswell, Way, Eisenberger, & Lieberman, 2007).

The effectiveness of treatments for behavioral dysregulation might thus be improved by developing a transdiagnostic intervention that targets mindfulness. Moreover, the *integration* of this intervention with disorder-specific treatments (e.g., cognitive-behavioral treatment [CBT] for eating disorders) might enhance efficiency of these treatments and lessen the chance that clients will segue to other dysregulated behaviors once the target has improved.

The purpose of this article is to (a) introduce a novel treatment, mindfulness and modification therapy (MMT), created for individuals with multiple areas of behavioral dysregulation and (b) present results of a pilot study of MMT targeting an underserved population with multiple dysregulated behaviors: women referred for alcohol-use disorders and domestic violence (e.g., physically aggressive acts toward a partner or adult household member). Despite the marked need for treatment of such women (Carney & Buttell, 2005; Ehrensaft, Cohen, & Johnson, 2006), empirically supported treatments are largely nonexistent.

Aggression and Alcohol Use by Women: The Need for an Integrated Treatment

Contrary to popular belief, community research shows that women are as likely to engage in domestic violence as are men (Ehrensaft et al., 2006). Domestic violence (DV), defined as violence toward a partner or other adult household member, occurs in at least 10% of U.S. households annually (Archer, 2002). Although DV initiated by women is less likely to cause injury (Archer, 2000), female-initiated DV can lead to reciprocal violence, which can then become severe. In addition, although some female violence occurs in reaction to previous violence (Swan & Snow, 2003), even reactionary violence has the potential to intensify the conflict and increase the risk of harm to the women and their families.

Of note is that children exposed to DV display long-term increases in behavioral and psychological problems (Sternberg et al., 1993), as well as increased likelihood of engaging in DV as adults (Ehrensaft, Moffitt, & Caspi, 2004), regardless the child's or perpetrator's gender. Consistently, women who engage in DV tend to have childhoods with chronic exposure to violence, both as witnesses and victims (Ehrensaft et al., 2006; Repetti, Taylor, & Seeman, 2002). These individuals have an increased likelihood of trauma symptoms, "negative emotionality" (intolerance of negative emotions, high stress reactivity, and tendency to perceive stimuli as threatening), and emotion dysregulation (Moffitt, Krueger, Caspi, & Fagan, 2000). Thus, violence might be one of the few methods these women have learned of regulating intense emotions and responding to conflict.

Another method might be alcohol use. Alcohol-use disorders are prevalent in women who engage in DV, and vice versa (Caetano, McGrath, Ramisetty-Mikler, & Field, 2005; Cunradi, Caetano, Clark, & Schafer, 1999; Stuart, Moore, Ramsey, & Kahler, 2004). Approximately half of women arrested for DV met criteria for hazardous drinking (as assessed by the Alcohol Use Disorders Inventory; Stuart et al., 2004), and more than half of women entering alcohol treatment reported engaging in violence the previous year (Chermack, Walton, Fuller, & Blow, 2001). This finding is especially troubling in that alcohol use predicts increases in both perpetration and victimization (Stuart et al., 2004).

Despite the need for treatment of women with violence and alcohol-use disorders, the only treatment with empirical support is behavioral couples therapy (BCT; Schumm, O'Farrell, Murphy, & Fals-Stewart, 2009). However, BCT is recommended only if the women agree to include the other adult in treatment, if the other adult also agrees, and if the other adult does not abuse substances (Schumm et al., 2009). Unfortunately, the fulfillment of all conditions can be rare (see *Procedures*). In addition, no treatment directly addresses the difficulty tolerating negative affect and problems coping with trauma-related symptoms. Thus, an efficacious treatment for women who have problems with aggression and alcohol is critically needed for the health and well-being of this underserved population and their families.

The current project addresses such needs by presenting a pilot study of MMT as provided to women court-referred for DV and alcohol disorders. MMT draws heavily from mindfulness-based relapse prevention (Bowen, Chawla, & Marlatt, 2010), while also including principles from dialectical behavioral therapy (Linehan, 1993) and emotion-focused therapy (Greenberg & Elliott, 2002). MMT might be particularly suited for these women, as, along with targeting the ability to experience/tolerate negative affect, MMT also addresses communication/empathy (as interpersonal issues often precede negative affect that can cue dysregulated behavior; Annis & Graham, 1995; Keltner & Kring, 1998). Moreover, treatments targeting mindfulness have shown promise for substance use (Bowen et al., 2009), interpersonal functioning (Chiesa & Serretti, 2009), emotion dysregulation (Linehan, 1993), and trauma (Follette, Palm, & Pearson, 2006). However, some might question whether a treatment requiring structured mindfulness and daily home-practice would be acceptable to clients with multiple dysregulated behaviors and strong emotion dysregulation. This project addresses that question.

Current Study

The current pilot project was an open treatment study to provide a preliminary investigation of whether a mindfulness-based therapy with substantial and formal outside practice is feasible and acceptable with court-mandated women with multiple areas of behavioral dysregulation. The study consisted of baseline measures, 12 individual therapy sessions, and end-of-treatment measures. We predicted significant reductions in the following variables during the last 4 weeks of treatment compared with the 4 weeks prior to treatment: (a) physical aggression, (b) days of alcohol use, (c) amount of alcohol per episode, and (d) days of drug use. Additional variables of interest included treatment retention and client satisfaction.

Method

Participants

Participants were 14 women, aged 21 to 64 years (mean [M] = 38, standard deviation [SD] = 13.44), who had recently been arrested for domestic violence (DV; defined as violence toward a partner or adult household-member) and who met criteria for alcohol abuse ($n = 6$) or dependence ($n = 8$). Nine women also used drugs at the time of intake. Drug use included cocaine dependence ($n = 1$) or abuse ($n = 5$) and cannabis dependence ($n = 1$) or abuse ($n = 2$). In addition, two women who used cocaine reported sporadically using cannabis, although neither met diagnostic criteria. The presence of an alcohol diagnosis was required to increase the homogeneity of the (very small) sample; however, secondary drug use was accepted for purposes of generalizability.

Participants were referred by family courts ($n = 11$), probation ($n = 2$), and substance clinics (upon discovery of violence arrest; $n = 1$) from the counties of New Haven and Milford, Connecticut. The following race/ethnicity was endorsed: six African American, four Latina/Hispanic, and four Non-Hispanic Caucasian. At the time of treatment, nine of the women lived with their romantic partners, three lived with another adult (relative or friend) toward whom she reported physical aggression, and two lived alone but reported frequent contact with adults toward whom they had reported aggression. Exclusion criteria included: opiate use (due to the inability of the clinic to provide opioid-replacement therapy); Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) criteria for schizophrenia or bipolar I disorder; concurrent enrollment in another treatment for alcohol, drugs, or anger/violence; and inability to speak or read English (due to limits of the research staff). Inclusion/exclusion diagnoses were assessed with the appropriate subscales of the Structured Clinical Interview for DSM-IV (First, Spitzer, & Gibbon, 1995).

Procedures

Participants were clients referred for treatment to the Yale Addictions and Substance Abuse Programs (ASAP), an inner-city substance clinic for court-referred clients. ASAP intake clinicians identified potential participants based on an intake interview administered upon entry into the clinic; trained clinical researchers then confirmed inclusion/exclusion criteria, invited clients to participate in the study, obtained informed consent, and administered assessments of substance use and aggression.

Twenty participants were identified by the intake staff as potentially appropriate for the study. Of the 20 potential candidates, three did not show up for the consenting and baseline assessment (nor did they accept offers to receive other treatment through ASAP or referrals to other clinics). In addition, three potential participants identified by intake staff were excluded from the study because of diagnosis of bipolar 1 disorder ($n = 1$) or lack of alcohol diagnosis (despite occasional alcohol use in conjunction with drug use; $n = 2$). Thus, 14 participants were enrolled in the clinical study.

Potential participants were informed that they could decline to participate or drop out of the study without negative repercussions from their referral source or the clinic. Those who declined, dropped out, or did not meet study criteria continued to have the opportunity to receive treatment in the ASAP clinic.

Potential participants were assured that no information about substance use, aggression, or any other content of therapy or assessments would be shared with their court-referral source. This information was communicated verbally and in the consent form. Participants were reminded of this confidentiality prior to baseline assessments and routinely throughout the therapy. Participants were assured that the only information that would be shared with their referral source was periodic confirmation of attendance, as is required of any clinic providing court-mandated treatment (and often less information than most programs share). Of note is that the penalty for not attending treatment for a first-time DV offense is often minimal to nonexistent. Individuals court-referred to such treatment often fail to show up for the initial intake or drop out within the first few weeks of treatment (e.g., Carney & Buttell, 2005) with few, if any, repercussions. Consistently, 21% of participants in the current study reported (to the therapist) that their court-referred partner or friend had stopped attending treatment and received no negative consequences. Finally, participants were informed that confidentiality would also be broken to report child abuse, elder abuse, or imminent suicidality or homicidality; no such reports were required in the study. This study was approved by the Institutional Review Board of Yale University School of Medicine.

Assessments were conducted by master's-level and doctoral-level clinical research staff that had been trained to reliability in earlier studies (Easton et al., 2007) and/or as a requirement for postdoctoral training. All therapy was provided by a doctoral-level psychologist, who is the primary developer of MMT and who has extensive training and experience with eight-week mindfulness-based treatments (such as mindfulness-based cognitive therapy) and dialectical behavior therapy, as well as less-extensive experience with acceptance and commitment therapy.

At the completion of treatment, participants were given the option of referral to additional treatment. Three participants were referred for recovery-maintenance treatment, one was referred for group treatment targeting nonsubstance issues, and three reported an intention to continue attending peer-based support groups.

MMT

All participants attended MMT for behavioral dysregulation, with some content customized to focus on issues relevant to aggression/anger and substance use by women. MMT is a 12-week to 20-week intervention (depending upon need) that has been conducted in either individual or group format. For the current study, the intervention comprised 12 weekly individual sessions: one 90-minute session followed by eleven 60-minute sessions. The primary focus of MMT is to help clients gain the ability to experience and tolerate the present moment,

Table 1
Outline of MMT. (Each Session Includes a 3-Minute to 16-Minute Mindfulness Practice in Session, as Well as a Home Practice Review and New Home-Practice Assignment)

Theme	Session	Topic(s)
Sessions 1–5: Mindful experiencing and tolerating of emotions, thoughts, sensations, urges, and cravings – and learning/practicing new responses	1	Introduction and assessment of client's goals and values. Use of motivation strategies. Introduction of dangers of automatic pilot and the benefits of mindful experiencing. Discussion of ways mindfulness and related skills can help client move toward living a life more consistent with values. Practice of basic mindfulness exercise (color body scan; approx 13 minutes). Home practice[a]: Begin daily CD and daily log; two activities from the Mindful Coping Toolbox (worksheet).
	2	Mindful exposure lite (i.e., exposure to current experiences with no induction of negative emotions or urges): Awareness and intentional experiencing of emotions, sensations, thoughts, and (possibly) urges in neutral situations. Practice of adapted SOBER breathing space (Bowen et al., 2010), which incorporates all of the above. Home practice: Begin daily SOBER breathing spaces.
	3	Mindful exposure I: Awareness and intentional experiencing of high-intensity emotions, sensations, thoughts, urges, and cravings in high-risk situations. (a) Guided visualization of a situation likely to elicit dysregulated behavior, (b) practice of SOBER breathing space (approx 10–15 minutes), and (c) visualization of reactions that are inconsistent with urges. Home practice: Mindfulness of daily activity.
	4	Mindful exposure II: Further awareness and intentional experiencing of high-intensity emotions, sensations, thoughts, urges, and cravings in high-risk situations. (a) Guided visualization of a situation likely to elicit dysregulated behavior, (b) practice of SOBER breathing space (approx 10–15 min), and (c) visualization of reactions that are inconsistent with urges. Home practice: Recording of high-risk situations incorporating skills.
	5	"Taking back power" and balancing acceptance and change: Realizing the power of being able to experience and accept a difficult situation and thus continue taking action toward valued goals - instead of being controlled by urges and habitual dysregulated behaviors that derail movement toward goals. Additional variations of exposure exercise conducted in Sessions 4 & 5. Home practice: Recording of high-risk situations incorporating skills.
Sessions 6–7: Mindful regulation of emotions	6	Identifying, scheduling, and mindfully participating in activities that are enjoyable, move client closer to an important goal, and/or help client feel like the kind of person she/he wants to be: Practicing coping with any avoidance urges or negative emotions that may occur prior to engaging in the activities. Home practice: Begin daily pleasant event or step toward goal.
	7	Setting up "urge roadblocks" to help clients engage in valued activity despite urges and other obstacles. (Example: resisting urge to engage in a drinking binge and thus retaining one's job/relationship, etc.) Note: Roadblocks are against *acting* on the urges, not *experiencing* the urges. Home practice: Urge Roadblock exercise.
Sessions 8–10: Mindful communication and relationship	8	Assertiveness/communication skills, Part I: Focuses on effectively expressing one's needs, with a lesser focus on perspective-taking and expressing understanding of other person(s). Home practice: Assertiveness exercise.

Table 1
Continued

Theme	Session	Topic(s)
	9	Assertiveness/communication skills, Part II: Continued work on assertiveness skills with increased focus on (a) working to understand the motives and views of others, (b) communicating this understanding to others, and (c) accepting interpersonal situations that don't immediately fit one's wants or needs. Beginning to set up additional social support if needed. Home practice: Assertiveness and Acceptance exercise
	10	Practicing acceptance/understanding/empathy with others *and* self: Additional practice fostering understanding and acceptance of people client dislikes and of self. Additional discussion of the power of acceptance (versus being controlled by one's judgments of others or self). Continuing to discuss/plan additional social support following treatment. Home practice exercise: Acceptance and Expression of Understanding or Appreciation
Sessions 11–12: Integration and generalization of skills; future planning	11	Integrating skills and discussing/scheduling skill use in novel situations. Creating plan for mindfulness practice following treatment. Home practice: Continuing to move toward a life that fits values: Integration and Planning
	12	Additional integrating and planning. Discussion of progress and ways client can continue working toward values (which may or may not have evolved over treatment). Discussion of tolerating sadness and anxiety related to termination. Relapse prevention and troubleshooting.

Note. MMT = mindfulness and modification therapy.
[a]Daily home practice is as follows: (a) guided mindfulness CD (10 to 16 minutes; Weeks 1–12); (b) brief daily log of emotions and urges (Weeks 1–12); (c) 2 to 3 SOBER breathing spaces (approximately 3 minutes each; Weeks 2–12); and (d) one pleasant event or step toward goal (Weeks 6–12). Additional weekly homework is described above.

including (when necessary) negative emotions, thoughts, and urges, without feeling compelled to engage in maladaptive behavior aimed at suppressing/avoiding such experiences. As outlined in Table 1, the treatment begins by helping clients gain the ability to experience neutral stimuli (such as certain physical sensations). Throughout the first five weeks, the client eventually visualizes distressing situations (either situations that will likely occur or that have occurred and led to maladaptive behavior) and intentionally experiences the distressing emotions, thoughts, and urges in session without engaging in distractive behavior. Additional sessions focus on the following issues common among individuals with behavioral dysregulation: (a) mindful regulation of emotions (including setting up "urge roadblocks" to help clients engage in valued activity despite obstacles; scheduling activities that are pleasant, move client closer to an important goal, and/or help client feel like the kind of person she/he wants to be; and practicing self-compassion); (b) mindful communication skills (including empathy/understanding of others' points of view, expressing that understanding *to* others, assertiveness, and improvement of specific relationships); and (c) integration of all skills and generalization to novel situations.

Mindfulness and related skills are taught and practiced in each weekly session; in addition, home practice assignments include a daily CD-guided practice (approximately 10 to 16 minutes), daily informal practices (0.5 to 5 minutes each, many of which can be practiced while engaging in standard activities), and additional assignments that broaden or add to the daily practices. Participants also use a daily log to record their emotions, urges, and (if applicable) any dysregulated behavior that occurs. These logs are reviewed by the therapist

Table 2
Comparison of MMT, DBT, and MBRP

	MMT	DBT	MBRP
Duration	12–20 weeks	6 months to 1 year	8 weeks
Targeted tx with the primary purpose of decreasing dysregulated behaviors that interfere with living according to values. (The relatively brief focus on mindful emotion-regulation and mindful communication are primarily to foster this purpose.)	x		
Comprehensive tx focused on decreasing overall emotion dysregulation and related instability in affect, cognitions, interpersonal functioning, and behavior. (Extensive focus on emotion regulation, mindfulness, interpersonal functioning, and distress tolerance)		x	
Targeted tx with the primary focus of decreasing addictive behaviors by changing relationship to craving and urges			x
Assignment of daily mindfulness practices	x		x
Formal mindfulness practice (in session & at home) with guided CDs	x		x
Mindfulness practice integrated throughout treatment (as opposed to assigned during a ''mindfulness module'' and then being one of the optional skills)	x		x
Manual mandates 3 or more sessions focusing on visualization of high-risk situations, practice of mindfulness exercises, and visualization of alternative reactions (guided exposure)	x		x
Mindfulness is *overtly instructed* as a component of *every* skill	x		x
Formal mindfulness assignments last at least 10 minutes	x		x
Treatments contain moderate overlap with one another in activities, instructions, and content of sessions.	(overlap with MBRP)		(overlap with MMT)
Includes strong focus on acceptance (nonjudgmental attitude)	x	x	x
Along with overall acceptance exercises, manual also includes focus on perspective taking, empathy, and expression of empathy	x		
Skills include overt efforts to *change emotions* (ex: sadness to joy)		x	
Skills include learning to tolerate/experience emotions and urges – with the knowledge that doing so tends to make emotions and urges more bearable (and, as a by-product, sometimes less intense); however, the *purpose* is to change clients' relationship to emotions/urges - *not to change emotions/urges*.	x		x

Table 2
Continued

	MMT	DBT	MBRP
Mindfulness is broken into components, and clients are asked to practice specific components (e.g., observe, describe, etc.)		x	
Core mindfulness component includes discussion of "reasonable mind" vs. "emotional mind" vs. the synthesis into a more-effective method ("wise mind")		x	
Extensive focus on understanding client and client's behavior – and working to help client do so as well	x	x	
Strong focus on the therapy relationship	x	x	
Work to help client purposefully engage in behavior that is effective for client's *individualized* needs, wants, goals and values	x	x	
Therapist has ability to modify contents of session(s) based on client's needs (as long as basic template and principles are followed)	x	x	
Strong, explicit focus on motivation and commitment	x	x	
Includes individual sessions, groups, 24-hr paging, and therapists' consultation groups		x	
May be integrated with other treatments or utilized as a "first step treatment" to decrease dysregulated behaviors which may otherwise interfere with subsequent, more in-depth treatment	x		
Target population: individuals with behavioral dysregulation (includes a transdiagnostic focus on factors relevant across a broad range of disorders)	x		
Target population: individuals with borderline personality disorder (with adaptations necessary to meet the needs of other disorders; e.g., depression in older adults, eating disorders, or substance use)		x	
Target population: individuals with addictive behaviors			x

Note: MMT = mindfulness and modification therapy; DBT = dialectical behavior therapy; MBRP = mindfulness-based relapse prevention.

without judgment or criticism; instead, the therapist works to help the client re-commit to abstinence, understand how the lapse(s) occurred, and plan for more adaptive coping if (when) similar internal and external cues occur in the future.

MMT offers a unique contribution to the field of treatment for behavioral dysregulation (see Table 2). Although MMT draws most heavily from (and is strongly indebted to) mindfulness-based relapse prevention (MBRP; Bowen et al., 2010), MMT differs from MBRP and traditional mindfulness-based therapies in that it (a) is intended to be delivered in

individual sessions or with small groups ($N \leq 10$), (b) includes a stronger focus on the therapeutic relationship, (c) targets general behavioral dysregulation, while also giving therapists the ability to customize sessions and/or skills to target specific behaviors, (d) includes home practice that can be customized to the individual needs of each client, and (e) includes a greater range of skills, such as skills that openly target change (although still with a focus on acceptance and tolerance of the current moment). Thus, perhaps traditional mindfulness treatments might be more appropriate for (a) larger groups, (b) settings in which a more-didactic style is needed, (c) circumstances that require a more time-limited treatment (8 weeks versus 12 to 20 weeks), and/or (d) situations in which a more-focused treatment is beneficial. In contrast, MMT might be more appropriate for clients who (a) have a broader range of dysregulation and psychopathology, (b) are more difficult to engage in treatment, and (c) would benefit from a more-customized approach.

MMT is also distinct from DBT (Linehan, 1993) in several significant ways. DBT is a *comprehensive* treatment focused on decreasing overall emotion dysregulation and related instability in affect, cognition, interpersonal functioning, and behavior; DBT skills training spends equal time on mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness. In contrast, MMT is a *targeted* treatment aimed primarily at decreasing dysregulated behaviors that interfere with living according to values. Every session *explicitly* targets mindfulness, and the brief additional focus on mindful emotion-regulation and mindful communication is intended principally to facilitate the key aim of decreasing dysregulated behavior. In addition, DBT and MMT utilize strikingly different methods for fostering mindfulness. MMT includes more-formal mindfulness exercises, more-structured home practice, and a less-complex array of skills. For example, MMT: (a) teaches targeted skill-enhancing exercises, most of which build directly upon skills learned the previous week (as opposed to the more comprehensive and complex set of skills in DBT); (b) assigns daily mindfulness practice (both formal and informal) throughout the *entire treatment*, which clients record in daily practice logs; (c) provides clients with audio CDs to guide them through the formal mindfulness exercises (which last 10-16 minutes each); (d) includes a mindfulness focus as an explicitly taught component of *every* skill (including those involving communication and emotion regulation); and (e) does not teach mindfulness by breaking down aspects of emotional processing (''emotion mind'' versus ''reasonable mind'' versus ''wise mind'') or mindfulness itself (e.g., observing, describing, participating, etc.) as does DBT. However, MMT does draw on DBT's (and acceptance and commitment therapy's) core dialectic of acceptance and change, while also sharing a focus on long-term values (versus short-term relief) and the inclusion of at least some focus on emotion regulation and communication skills.

Measures

Alcohol, drug use, and physical aggression. The Timeline Follow-Back Assessment Method (TLFB; Sobell & Sobell, 1996) was used to measure alcohol use, drug use, and physical aggression at baseline, weekly treatment sessions, and end-of-treatment. The TLFB is a reliable and valid semistructured interview in which a calendar is used to collect retrospective reports of dysregulated behaviors (Sobell & Sobell, 1996). The TLFB was developed to assess participants' drinking histories during a specific time period (Sobell, Sobell, Klajner, Pavan, & Basian, 1986), and it has been modified to include assessment for drug use (Sobell & Sobell, 1996) and relational aggression (Stappenbeck & Fals-Stewart, 2004). Participants are provided a calendar with memory prompts (such as holidays and days of treatment attendance) and asked whether they engaged in any (a) alcohol use, (b) drug use, or (c) physical aggression on each specific day. If participants endorse any of the behaviors, they are asked for additional details (e.g., type, size, and number of drinks; type of drug[s] used; type of aggression). The TLFB is widely used and has demonstrated high reliability and validity across a number of studies when administered to assess drinking, drug use, and/or physical aggression (e.g., Bowen et al., 2009; Linehan et al., 1999; Sobell et al., 1986; Sobell & Sobell, 1996; Stappenbeck & Fals-Stewart, 2004; Witkiewitz & Bowen, 2010).

In addition, objective measures of weekly substance use included breath-analyzer machines to screen for alcohol use and urine toxicology screens (Roche Diagnostic's Testcup5 with adulteration checks) to screen for drug use. Validity of the TLFB in the current study is supported by the level of agreement with objective measures of substance use (drug use: 97%; alcohol use 99%).

Client response to treatment. Treatment response was assessed via retention rate and through a survey immediately prior to the final therapy session. The survey (adapted from a similar survey administered after a study on mindfulness-based relapse prevention; Bowen et al., 2009) included quantitative questions (*On a scale of 1–10, how confident are you that you'll continue to practice the formal mindfulness skills* [*like the CD practices*]?) and open-ended questions (*How could the treatment be improved*?).

Results

Of the 14 participants in the intent-to-treat sample, 13 (93%) completed all 12 therapy sessions. One participant terminated treatment after the fifth therapy session and could not be reached for additional assessments.

Due to the preliminary and exploratory nature of this treatment-development study, participants were allowed up to 20 weeks to complete all 12 sessions, as long as participants did not miss more than 2 successive weeks without a physician's confirmation of a medical excuse. The mean number of weeks for clients to complete all 12 sessions was 14 weeks ($SD = 2.41$); the median was 13 weeks; and the range was 12 to 19 weeks. (The individual who took 19 weeks was hospitalized and homebound for more than 4 weeks, due to a documented illness unrelated to substance use or violence. During her absence, she kept a daily diary to record her continued skills practice. She returned at Week 8, and thus completed the last four sessions within 4 weeks.)

Results from the breath-analyzer tests were consistent with self-reported alcohol use 99% of the time. The two instances of inconsistent reports were with the same client, who had lapsed after weeks of abstinence and had admitted drinking a number of days the previous week (but not initially on the day of treatment). Results of the urine toxicology screen for drugs were consistent with self-reported drug use 97% of the time. During the last 6 weeks of treatment, results of the urine screen were consistent with self-reports 100% of the time. To provide the most conservative measure of use, the current study coded substance use as present if either the self-reports or objective measures were positive.

To test the hypothesized reductions in substance use and aggression, we followed the lead of studies which compared a specific amount of time prior to treatment to the same amount of time during the final weeks of treatment or the weeks following treatment (Axelrod, Perepletchikova, Holtzman, & Sinha, 2011; Bowen et al., 2009). To compare substance use and aggression in the 4 weeks prior to treatment versus the final 4 weeks of treatment, Wilcoxon's signed-ranked tests were used for nonparametic comparisons of related samples. Effect sizes were calculated by dividing the resulting z score by the square root of the total observations; effect sizes of $r \geq .5$ are considered large (Field, 2005).

Results showed significant decreases in the number of reported drinking days in the 4 weeks prior to treatment ($M = 11.43$, median [Mdn] = 9, $SD = 7.23$, range = 23) compared with the number of drinking days reported in the last 4 weeks of treatment ($M = 1.36$, $Mdn = 0$, $SD = 3.27$, range = 10), $T = 0$, $p = .001$, r (*effect size*) = .62. In addition, average reported number of drinks consumed per drinking day decreased significantly from the 4 weeks preceding treatment ($M = 4.21$, $SD = 1.42$, $Mdn = 4.0$, range = 4) to the final 4 weeks of treatment ($M = 0.68$, $SD = 1.39$, $Mdn = 0$, range = 4), $T = 0$, $p = .001$, r (*effect size*) = .63. Of those participants using drugs at the time of intake ($n = 9$; 64%), the days of drug use decreased significantly from the 4 weeks pretreatment ($M = 5.44$, $SD = 1.9$, $Mdn = 4{,}0$, range = 14) to the 4 final weeks of treatment ($M = 0.11$, $SD = 0.33$, $Mdn = 0$, range = 1), $T = 0$, $p = .007$, $r = .63$.

Significant decreases were also shown for self-reports of physical aggression. Ninety-three percent of participants reported engaging in at least one act of physical aggression in the 4 weeks prior to treatment, and 0% reported engaging in physical aggression in the final 4 weeks of treatment ($T = 0$, $p < .001$, $r = .68$).

Treatment response was assessed via retention rate (93%) and through open-ended surveys immediately prior to the final therapy session. Although many participants (either in response to the survey or verbally in the final session) reported feeling skepticism prior to beginning treatment, 100% of participants reported that they would have completed the full treatment even if not referred by the courts. Participants also rated the treatment as highly helpful ($M = 9.62$ on a 10-point scale; $SD = 0.96$) and expressed confidence they would continue practicing the formal skills (such as the CDs; $M = 8.54$ on a 10-point scale; $SD = 1.51$) and the informal skills (such as daily breathing spaces; $M = 9.77$ on a 10-point scale; $SD = 0.44$).

In response to a general question about how the treatment could be improved, 62% responded that they wished the treatment were longer in duration, which was consistent with clinical observation. The only other suggestion for improving treatment ($n = 1$) was that the program should focus on fostering support systems earlier in the treatment.

When participants were asked to elaborate on why they answered the way they did, several themes emerged. Primary themes included (a) feeling like a better person and/or liking self better (62%), (b) improved relationships with family members and/or partner (54%), (c) receiving compliments from important others about changes in behavior (54%), and (d) improved relationship with God or church (23%).

Finally, although participants were invited to bring their partners or another close adult to the three therapy sessions that focused on communication, no participants brought additional people to any session. One reported that her partner refused to attend, one said her partner's schedule precluded attending, and the others said they wanted the freedom to discuss personal issues without partners, friends, or family members present.

Discussion

MMT is a novel treatment that was developed to target behavioral dysregulation and related issues, including difficulty tolerating situations with the potential of being uncomfortable or distressing, tendency to react automatically with habitual responses, and difficulty being attentive/aware of the present moment in the face of cues and urges to engage in dysregulated behavior. MMT also targets associated issues that are risk factors for dysregulated behavior, such as lack of pleasurable/fulfilling life experiences and difficulties with empathy, perspective taking, and mindful communication. Finally, portions of MMT can be customized to target specific dysregulated behaviors and individual needs.

The purpose of the current project was to: (a) present a novel treatment (MMT) developed to target individuals with behavioral dysregulation, (b) provide a preliminary investigation of whether a treatment that includes a mindfulness focus and substantial at-home skills-practice is feasible and acceptable with women court-referred for alcohol use and violence, and (c) collect pre-post pilot data assessing the effects of MMT on substance use, aggression, and treatment retention. Data from this open-treatment study provide preliminary evidence that MMT is a feasible and acceptable treatment that might (a) decrease alcohol and drug use, (b) decrease incidents of physical aggression, (c) increase client retention, and (d) engage difficult-to-engage clients in treatment.

The current project included a preliminary, pre-post study of MMT administered in weekly individual sessions to 14 women who were court-referred for physical aggression and alcohol abuse/dependence. Consistent with hypotheses, results showed significant and large decreases in self-reports of physical aggression, alcohol use, and drug use (confirmed by urine toxicology screens) in the last 4 weeks of treatment when compared with the 4 weeks prior to treatment. Decreases in alcohol use were found for number of days in which alcohol was consumed, as well as average amount of alcohol consumed in each day of drinking.

Moreover, retention was 93%, notably higher than the usual 50%–70% found in treatments for similar court-involved populations (e.g., Carney & Buttell, 2005; Carroll et al.,

1998, 2004; Easton, Babuscio, & Carroll, 2007; Sinha, Easton, & Kemp, 2003). It is important to note that, because of the preliminary nature of the study, women were allowed up to 20 weeks to complete all 12 sessions of the treatment; however, the median number of weeks to complete was 14. It might be argued that the flexibility in calendar weeks could have artificially improved the outcomes, as the women had more time in which to become abstinent and more flexibility in attending. However, it might also be argued that this extra time could have artificially *deflated* the outcomes, as the women also had more time to relapse and to drop out of treatment. Additional research is needed in which the number of calendar weeks is held constant for all participants.

In addition, the response from the women was very positive. In end-of-treatment surveys, women rated the treatment as highly helpful and reported strong confidence that they would continue to practice the formal and informal skills. In the exit survey and in therapy sessions, women often reported improvements in their self-image (to the extent that many talked about feeling like "a different person"), improvements in their relationships with family members and significant others, compliments by friends and family about how different they seemed since beginning treatment, and improvements in their relationships with God or the church. In addition, all of the participants reported that they would have completed treatment even if they had not been court-referred.

When asked how the program could be improved, 62% said that the program needed to be longer. Consistently, clinical observation suggested that several clients might have benefited from more sessions to learn and practice specific skills (especially mindful communication skills, empathy/understanding of others' view, and breaking down of goals). In addition, participants at times appeared to have trouble integrating the skills, often utilizing either a favorite skill and/or the skill most recently learned. Thus, clients might benefit from additional training and practice to more adeptly master certain skills and/or generalize skill use, as well as more weeks of abstinence before ending therapy. Future treatment-development research should be conducted on the utility of lengthening MMT to provide more training and practice of certain skills, as well as additional guidance in integrating and generalizing skills. Also, although participants were invited to bring significant others to some of the sessions, no participant chose to do so. Further research should examine the potential benefits of omitting this invitation.

Limitations and Future Directions

This study has several substantial limitations, including the small sample size, the lack of a control condition, the lack of post-treatment follow-up, the inability to assess nonsubstance diagnoses or other variables of interest (e.g., mindfulness, emotion regulation, anger, trauma symptoms), and the provision of MMT by one therapist. Thus, we are unable to state that results were due specifically to MMT as opposed to other variables (such as therapist effect, time, participant motivation, etc.). Future studies should replicate these findings with (a) larger samples, (b) a randomized controlled design to determine that effects are due specifically to MMT, (c) assessment of diagnoses and variables of interest at baseline, (d) additional assessments during and following treatment to help understand outcomes and mechanisms of change, and (e) follow-up assessments to investigate outcome stability. Further randomized clinical trials should also use multiple therapists in each condition.

Finally, although drug use was assessed with both self-report and urine screens, physical aggression and alcohol use were assessed primarily by self-report (with the exception of the breath-analyzer screen for recent alcohol use). Of note is that self-reports of violence have been shown to be reliable and valid in studies in which participants are assured of confidentiality (Terrie E. Moffitt et al., 1997), and that self-reports of drug use in the current study matched objective measures 100% in the last 6 weeks of treatment, thus adding some credibility to the self-report data. In addition, communications with the court system revealed that no participant was arrested for violations related to violence or substance use during treatment. However, future research should include additional measures, such as collateral reports of

violence and measures of alcohol use (such as select urine screens and hair analyses), which can assess use for periods of days or weeks.

Despite the limitations, the current study has substantial clinical and research merit. First, it provides additional support for the feasibility and acceptability of targeting mindfulness skills in individuals with multiple areas of behavioral dysregulation (such as substance use and violence). Second, it suggests that difficult-to-engage clients with multiple areas of dysregulation can engage in a treatment that involves formal and informal mindfulness practice, as well as substantial home assignments. Third, it provides preliminary evidence of the utility of MMT in addressing co-occurring dysregulated behaviors of substance use and violence. Finally, it presents a treatment that appears feasible for women with co-occurring alcohol-use disorders and physical aggression. These findings suggest that a focus on mindfulness might be an acceptable and beneficial component in treating this critically underserved population.

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