

An Examination of Mindfulness-Based Experiences Through Adventure in Substance Use Disorder Treatment for Young Adult Males: a Pilot Study

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Abstract The aims of this exploratory pilot study were to examine how a substance use disorder (SUD) treatment program for young adult males integrated mindfulness-based experiences into the treatment process, and to assess the impact of these experiences on the development of mindfulness skills and treatment outcome. The study utilized a within-subject naturalistic mixed-method design that integrated quantitative and qualitative data where all participants who entered treatment and agreed to participate in the evaluation were included in the data collection. A total of 32 young men were included in the analysis with an average age of 22.9 years. Statistically significant changes in scores on the Five Facet Mindfulness Questionnaire (FFMQ) from pre- to post-treatment were noted for all clients as a result of treatment, and these changes were strongly correlated to treatment outcome as indicated by statistically significant changes in total OQ-45.2 scores. Clients also showed specific improvement in scores on mindfulness skills related to the *nonjudging* and *nonreactivity* facets of the FFMQ which were related to reductions in the client's overall subjective distress as measured by the OQ-45.2. Qualitative findings from analysis of client comments support these findings and highlight client perspective of the value of mindfulness-based experiences in addictions treatment. Despite the limitations inherent in this exploratory study, mindfulness-based experiences (MBEs) are discussed as a

promising approach in the treatment of SUD and suggest further research in this area of addiction treatment.

Keywords Mindfulness · Mindfulness-based interventions · Mindfulness-based relapse prevention · Mindfulness-based experiences · Adventure therapy · FFMQ · OQ-45.2

Introduction

Substance use disorder (SUD) is a chronic public health problem that produces significant costs to individuals struggling with addictions, the communities in which they reside, and the health care systems that are stressed with providing treatment alternatives across the continuum of care to help address this persistent problem in behavioral health care (McCollister et al. 2013). Mindfulness-based interventions (MBIs), including meditation interventions like those reported by Bowen et al. (2006), and relapse prevention programs (Bowen et al. 2009) are receiving considerable attention in the literature as an effective treatment alternative, especially for clients struggling with SUD (Black 2014).

Much of the research that has been done on mindfulness-based interventions (MBI) has been in the area of mindfulness-based relapse prevention (MBRP) programs, which are often integrated with educational or cognitive-based therapy sessions to enhance treatment as usual (TAU) approaches. For example, Bowen et al. (2009) examined an MBRP that included meditation and educational sessions designed to help participants develop acceptance and awareness of their triggers and effectively reduced substance use and cravings. Results of their controlled study showed that the participants in the MBRP group showed significantly less substance use and cravings at the 4-month follow-up and significantly higher levels of awareness of triggers. In a more

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recent randomized controlled trial (RCT), Bowen et al. (2014) compared a similar MBRP with (a) a cognitive therapy relapse prevention program (RP) and (b) a 12-step psycho-educational program (TAU). The results of this study showed that individuals in MBRP and RP conditions were at less risk for drug use and heavy drinking than those in the TAU condition. At the 12-month follow-up, MBRP participants reported significantly fewer days of substance use and significantly decreased heavy drinking when compared with RP and TAU groups. Witkiewitz et al. (2014) also examined the effectiveness of an MBRP for women in the criminal justice system and found that participants in the MBRP group showed significantly fewer drug use days and fewer legal and medical problems at the 15-week follow-up period post-incarceration when compared with to TAU group.

The efficacy of MBRP interventions in SUD contexts is promising and has generated interest from neurocognitive researchers interested in the therapeutic mechanism of these emerging therapies. Garland et al. (2014a) offered a conceptual framework for how MBIs specifically target cognitive, affective, and neurobiological systems that have been affected by repeated drug use. Although a complete review of this neurocognitive model is beyond the scope of this paper, Garland et al. (2014a) hypothesized that addicts have an inability to control cognitive and emotional responses to cues and stress that trigger craving and substance use and are unable to find pleasure from natural rewards due to the numbing effect of chronic substance use.

To retrain this response mechanism, Garland et al. (2010) have developed the Mindfulness-Oriented Recovery Enhancement (MORE) intervention that involves developing mindfulness, reappraisal, and savoring skills; this intervention has demonstrated some promising results in clients with SUDs (Garland et al. 2014b). They posited that increasing *dispositional* mindfulness, a mindset characterized by nonreactive awareness and acceptance (Baer et al. 2006), is a protective factor that buffers individuals from craving (Garland and Roberts-Lewis 2013). Individuals with increased dispositional mindfulness positively impact their attention–appraisal–emotion interface when they are able to more accurately evaluate their present circumstances through limiting emotional bias and assessing their ability to deal with their present challenges. Savoring, defined as the selective attention to positive experience (Bryant 1989; Quoidbach et al. 2010), allows SUD individuals to attend to a wide diversity of sensations and perceptions and to the positive emotions elicited by the experience. Exploring how these experiences in treatment promote being aware of, attending to, and savoring naturally occurring and naturally rewarding nondrug practices and how these experiences translate to dispositional changes and well-being is an important area of research, especially in applied settings. These experiences are expected to allow what Garland et al. (2014a, b) characterized as “repeated practice

of regulating addictive responses and extracting pleasure from life in the absence of substance use” (p. 12).

These controlled studies, systematic reviews, and meta-analyses of controlled studies suggest that mindfulness-based practice, when woven into treatment practice or relapse prevention programs, can have positive effects on SUD treatment outcomes when compared to waitlist controls, nonspecific educational support groups, and specified control groups (Black et al. 2009; Zgierska et al. 2009; Chiesa and Serretti 2013). These reviews have predominantly focused on outcomes and not on the development of mindfulness skills with the exception of a few studies. Bowen et al.’s (2009) study on MBRP demonstrated greater decreases in craving *and* increases in acceptance and acting with awareness, two important facets of mindfulness. Garland et al. (2014a, b) examined nonreactivity as a therapeutic mechanism to reductions in pain severity and pain interference. By specifically examining how mindfulness-based experiences (MBEs) can develop certain facets of mindfulness, particularly acting with awareness, being nonjudgmental, and nonreactivity, it is possible to better understand how MBEs work to impact treatment outcome and posttreatment substance use (Fernandez et al. 2010; Levin et al. 2013).

It is important to draw a distinction between mindfulness *interventions* and mindfulness *experiences*. We define mindfulness-based experiences (MBEs) as 1- to 4-day or longer nature-based adventure experiences that include camping, hiking, rock climbing, rappelling, white water canoeing, river crossing, solo experiences, 24-h hikes, and “passage” journeys. These nature-based experiences are intentionally designed to provide participants with an opportunity to practice and develop mindfulness skills related to their treatment goals. Prior to embarking on an MBE, clients will sit individually or in a group with the clinician and adventure leaders and speak to their history, their intentions for the trip, and how those intentions relate to their treatment goals. This process frames the experience for each client and provides a reference point for the client, the leaders, or the other members to check for active engagement in the process. The goals are to practice mindfulness skills (*nonreactivity, acting with awareness, nonjudging, observing*, and acceptance of the experience), attend to their intentions on the trip, and be fully present in the moment. Being mindful is discussed often and openly by the clinical staff, the adventure leaders, and the clients as they work through the process. MBEs are distinctive because they are more prescriptive, intentional, client-driven, and less systematic and manualized than MBIs described elsewhere (e.g., Chiesa and Serretti 2013; Garland et al. 2010; Kelly et al. 2012). Also important to note is that MBEs as we have defined them here should not be confused with adventure therapy, which has been well defined elsewhere (Gass et al. 2012).

The results from a 2-year pilot study of a 90-day SUD treatment program in Alberta, Canada, are presented to

address a growing need for more applied research on the effects of integrating MBEs in SUD treatment (Fernandez et al. 2010). The aims of this pilot study were to (a) explore how elements of the program, specifically the adventure “short sharp” mindfulness-based experiences (MBEs), and subsequent discussion of those experiences related to changes in dispositional mindfulness and treatment outcome, (b) explore whether a relationship exists between the measurement of dispositional mindfulness facets and changes in client well-being, and (c) explore client perceptions of their MBEs to better understand how they contribute to their treatment process and subsequent outcome.

Method

Participants

Shunda Creek (hereafter referred to as Shunda) is an open enrollment 90-day residential treatment program for 18–24-year-old adult males located in Alberta, Canada. Shunda began operation in 2009 and employs a program director, clinical director and team, an alumni coordinator, and therapeutic staff who work directly with the clients on a day-to-day basis. The program director approached the authors to work directly with the leadership team to evaluate the effects of an initiative to strengthen the intentional use of mindfulness-based experiences through adventure in nature and explore their collective impact on treatment adherence and outcome. Utilizing a practice-based evidence approach (Green 2006), the researchers approached the project as program evaluators, involving stakeholders in the study to ensure that the evaluation instruments and subsequent results were useful, credible, and informative (Patton 2003). Stakeholders included the program directors, clinicians, staff, clients, funders, and the broader field of psychology and SUD treatment (Urban and Trochim 2009).

Shunda focuses on treating co-occurring addiction and mental health issues with the goals being to increase client self-awareness of their substance use history and enhance their personal volition. Shunda emphasizes relationship building between the client and therapeutic staff through the use of (a) natural consequences, (b) a technique called “inviting a conversation,” (c) nonpunitive behavioral contracting, and (d) rituals, including fireside chats and welcoming fires, and passage experiences at the end of treatment.

Shunda integrates MBEs throughout treatment to help clients be present, open, and aware of their substance use treatment process. These experiences typically consist of 1- to 5-day trips that are referred to as “mindfulness in action.” The MBEs are client-initiated with planned goals, themes, and foci and may involve a water-based canoe trip, or a climbing or backpacking trip in the nearby Northern Rockies. Clients

relate the experience to their treatment process and goals through discussion with staff and their peers. For example, a rock climbing experience may involve a client directly confronting his physical abilities and fear of heights, which may be related to fears that the client might have confronting stressors and post-treatment social situations that may lead to relapse and misuse. These reflections are done “in the moment” to help make the experience concrete and relevant for the client as they progress through their treatment plan. Clients practice mindfulness-based skills (observing, acting with awareness, nonjudging, and nonreactivity) during their reflections, during the experience, and upon return from their experience during the trip debrief. Clients are also routinely asked to rate their level of mindfulness while they were on their trip. On average, a client may participate on one trip per week throughout their 90-day stay in the program.

Procedures

The current study utilized a within-subject naturalistic mixed-method design that integrated quantitative and qualitative data where all participants who entered treatment and agreed to participate in the evaluation were included in the data collection that took place between January 2013 and June 2014. The study received approval from the Institutional Review Board at Georgia College, Milledgeville, GA, and all participants consented to their involvement in the study. Morse and Niehaus (2009) have defined mixed-method designs as “scientifically rigorous research project[s], driven by inductive or deductive theoretical [approaches], and comprised of qualitative or quantitative core components with qualitative or quantitative supplementary components” (p. 14). Mixed-method research involves a primary method and a supplemental component that is partially complete and that is not conducted rigorously enough to stand alone or to be published by itself (Morse and Niehaus 2009). Vandenberg and Lance (2000) also support using a mixed-method approach when examining social constructs like mindfulness that may change over time, calling into question the measurement invariance assumption. Researchers suggest that respondents’ perceptions of the meaning attached to certain survey questions assessing social constructs change over time because of their direct experience with the construct of focus, in this case mindfulness (Schmitt and Kuljanin 2008). Though not the primary method utilized in this study, qualitative perceptions of mindfulness while engaged in the MBEs were also included in the analysis.

This yielded a sample size of 43 clients over the course of this data collection period. Support staff at the program administered all intake, process, and discharge questionnaires except the OQ-45.2 (Lambert et al. 2011). Using a progress monitoring (PM) framework, the clinical therapist administered the OQ-45.2 at admission, every 2 weeks, and at

discharge from treatment which was used as a therapeutic tool during clinical sessions with the client. This approach was based on several factors related to this study: (a) Randomized controlled trials have revealed that providing real-time client and therapist feedback in sessions leads to positive treatment outcome (Lambert et al. 2003; Slade et al. 2008), (b) social desirability and test–retest artifacts were not found in controlled trials of repeated measurements with this instrument (Durham et al. 2002), and finally, (c) there is a growing need to implement PM in SUD treatment settings, and stakeholders felt that this was important to pursue (see Goodman et al. 2013).

Measures

To assess treatment outcome, the Outcome Questionnaire OQ-45.2 scores at admission and discharge were used to produce a change score which can indicate reliable and clinically significant change as a result of treatment (for more information, see Lambert et al. 1996). Using similar procedures reported in the literature to derive treatment outcome from pre- and post-treatment assessments (see Schibbye et al. 2014), the difference scores between the pre-treatment and post-treatment OQ-45.2 and subsequent subscales were treated as an outcome measure (dependent variable) in subsequent analyses. The OQ-45.2 assesses three domains of psychosocial functioning: (a) *subjective discomfort* (“I feel that something is wrong with my mind”), (b) *interpersonal relations* (“I have frequent arguments”), and (c) *social role performance* (“I feel that I am not doing well at work”). The OQ-45.2 is a Likert scale instrument that contains 45 items and that computes a total score, which can range from 0 to 180, with lower scores indicating high levels of psycho-social functioning and higher scores indicating lower levels. Lambert et al. (1996) found the OQ-45.2 to have test–retest reliability estimated at $r=.84$, strong overall internal consistency ($\alpha=.93$), and concurrent validity estimates ranging from $r=.60$ to $r=.88$ across several measures of psychosocial functioning. Further analysis of the OQ-45.2 by Vermeersch, Lambert, and Burlingame (2000) demonstrated the instrument’s ability to assess sensitive psychosocial change.

The Five Facet Mindfulness Questionnaire (FFMQ), administered at admission and discharge, was used to assess the relative change in mindfulness skills as a result of treatment (Baer et al. 2006). The FFMQ is a 39-item self-report measure that assessed how mindful clients were at various stages of treatment. The five subscales which comprise the scale are (a) observing (“When I am walking, I deliberately notice the sensations of my body moving”), (b) *describing* (“I am good at finding words to describe my feelings”), (c) acting with awareness (*awareness*) (“I am easily distracted”), (d) nonjudging (“I tell myself I shouldn’t feel the way I am feeling”), and (e) nonreactivity (“I watch my feelings without

getting lost in them”). The FFMQ has been found to be a reliable and valid measure of mindfulness in past research with nonclinical (Baer et al. 2006) and clinical samples (Bohlmeijer et al. 2011). The FFMQ allows comparison of findings with previous research examining deficits clients may have in certain facets of mindfulness, particularly acting with awareness, nonjudging, and nonreactivity (Fernandez et al. 2010; Levin et al. 2013). Each FFMQ item is rated on a five-point scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Negatively worded items were reverse-scored so that, for each subscale, higher scores indicated greater mindfulness. Because the development of mindfulness was also a treatment outcome, change scores were also computed from pre- to post-treatment.

To assess the severity of substance use history and the clients’ perspective on the role drugs and alcohol play in their lives, the Personal Involvement with Chemicals (PICS) scale of the Personal Experience Inventory (PEI; Winters and Henly 1989) was administered at admission to treatment. The PICS was used as a clinical tool to explore with the client why they were in treatment, and to set treatment goals and relapse prevention plans. The PICS consists of 29 items and measures general drug abuse severity and outlier patterns of drug use experiences, using a four-point response set (1=never, 2=once or twice, 3=sometimes, 4=often). The instrument has excellent psychometric properties and normative data (see Winters and Henly 1989).

A short questionnaire was developed to ask clients how mindful they believed they were during their adventure experience (MBE). As noted above, a visual analog scale (10 cm) captured the response by asking the client to mark on the line the degree to which they were mindful during the experience and how they believed the adventure experience helped them in their treatment progress. The assessment also included a qualitative follow-up question that simply asked, “How do you know this?” This allowed the respondents to provide supporting evidence for their assessment. The instrument was pilot-tested over a month with clients and staff, and revisions were made in language and visual presentation. Qualitative responses to this questionnaire were included in the analysis to help provide context from the client as to how the intervention may have been useful in facilitating a state of mindfulness for the client during the experience.

Data Analyses

All demographic and psychosocial data collected at admission to the program, including age, number of days in treatment, treatment completion, and substance use history, were examined using descriptive statistics and checked for normality. Correlations among these variables were in the low range and were negative and nonsignificant except treatment completion and the number of days in treatment, which was

expected and significant ($r=.883, p<.001$). Bivariate correlations explored whether demographic, psychosocial, or baseline scores in mindfulness were related to changes in the OQ-45.2 outcome measure. In addition, bivariate correlations of the change in total mindfulness scores as well as the five domains of mindfulness were correlated with the OQ-45.2 total and subscale change scores. Each of these significant correlations was then entered into a series of regression models to determine if they were uniquely significant predictors of OQ-45.2 change (Bettman et al. 2012). Qualitative data analysis involved reviewing each client's responses through time to examine their justifications and responses to the question "How mindful were you on this experience and how do you know this?" Themes were developed from these narrative responses and related to the five facets of mindfulness developed by Baer et al. (2008), and more specifically to the domain of nonjudging.

Results

A total of 43 clients were included in the analysis with an average age of 22.9 years. A total of 32 clients completed treatment (74.4 %) with an average treatment length of 93.7 days, while 11 did not complete treatment (25.6 %) and averaged 34.4 days. In discussions with the clinical director, reasons cited for treatment noncompletion were as follows: (a) Treatment was "not a good fit," (b) client believed they had made sufficient progress and thus self-discharged, (c) clients were not ready to address their substance use issues at that time, and (d) other. Although no significant differences were found between completers and noncompleters on pre-treatment OQ-45.2 scores ($t(40)=-1.86, p=.07$) or other key variables, treatment noncompleters were dropped from the study due to differences in available qualitative data and because treatment dosages were significantly different; this yielded a useable sample size of 32 for further analysis.

Substance use frequency assessments from the PICS revealed that clients were most likely to report moderate to heavy use of cigarettes, alcohol, and marijuana, followed closely by cocaine use, in the 90 days prior to entering treatment. These use patterns reflect clients use histories and frequencies found in assessments of inpatient and outpatient treatment programs in North America as reported by Winters and Henley (1989). Primarily, these young men report that they use substances excessively, have anti-social behavior associated with their substance use including theft and the selling of drugs, and use substances to self-medicate their feelings.

Preliminary Treatment Outcome

All pre- and post-treatment mindfulness total (FFMQ) and subscale scores and OQ-45.2 total and subscale scores were

significantly different indicated by pairwise t tests using Bonferroni adjustments with moderate to high effect sizes for each at $p<.05$ (see Table 1). Examination of the bivariate correlations revealed that the total change in mindfulness scores was significantly correlated with the total change in OQ-45.2 scores ($r=.478, p=.006$). Two additional variables, the nonjudging ($r=.420, p=.01$) and nonreactivity ($r=.419, p=.01$) subscale difference scores of the FFMQ, were also significantly correlated with the total change in OQ-45.2 scores. In addition, the nonjudging ($r=.436, p=.007$) and nonreactivity ($r=.344, p=.05$) difference scores from the FFMQ were also significantly correlated with the subjective discomfort OQ-45.2 subscale change scores. The PICS scores, which assessed drug and alcohol use frequency and their psychosocial involvement with drugs, were not significantly correlated with the OQ-45.2 or subscale change scores.

Unique Contributions of Mindfulness Skills to Treatment Outcome

Based on the pattern of correlations, a series of regression models was conducted to explore the unique contributions of these variables to changes in OQ-45.2 scores from admission to discharge. It is important to continually remind the reader that this study is exploratory, and the goal of this analysis was to examine how changes in mindfulness as assessed by changes in FFMQ score might help explain changes in treatment outcome. These analyses in no way imply causality. The first regression model explored the unique contribution of the change in mindfulness (total change in FFMQ score) to the total change score in the OQ-45.2 (see Table 2). The overall regression model was statistically significant ($F(1,41)=7.25, p=.03$) with 11 % of the total variance explained. A second model exploring the nonjudging and nonreactivity subscales of the FFMQ and their contributions to OQ-45.2 change was also statistically significant ($F(1,41)=6.78, p=.01$). The unique contribution of the nonjudging subscale change score was statistically significant ($B=-1.59, p=.01$) and explained 14 % of the variance, which was greater than the first model using the total mindfulness score. The nonreactivity subscale explained little additional variance (3 %) and was nonsignificant ($B=-1.41, p=.23$). A third model exploring the nonjudging and nonreactivity subscales of the FFMQ and their contributions to the OQ-45.2 subscale subjective discomfort was also statistically significant ($F(1,41)=11.69, p=.008$). Nonjudging explained 16 % of the variance and was a significant predictor ($B=-1.04, p=.008$) with the nonreactivity subscale again adding no additional explanation (1 %) to the model ($B=-.490, p=.49$). The highly correlated nature of the nonjudging with the awareness ($r=.543$) and nonreactivity ($r=.569$) subscales inherent in the FFMQ should be noted and will be discussed. Collinearity diagnostics for all regressions, however, were in the acceptable range (tolerance values greater than .10).

Table 1 Paired sample *t* tests of OQ-45 total and subscales and FFMQ total and subscales showing change in scores from pre- to post-treatment including effect sizes (*R*)

Variable pairs	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>t</i>	<i>df</i>	<i>Sig</i>	<i>R</i>
OQ-45 total – OQ-45 post	37.11	29.59	5.23	7.12	31	.000	1.29
<i>Subscale scores</i>							
Subjective discomfort pre – subjective discomfort post	23.00	17.71	3.13	7.35	31	.000	1.29
Interpersonal relations pre – interpersonal relation post	7.41	7.41	1.39	5.29	31	.000	.93
Social roles pre – social roles post	6.93	6.93	1.27	5.46	31	.000	.968
FFMQ pre – FFMQ post	–25.03	19.40	3.43	–7.30	31	.000	1.44
<i>Subscale scores</i>							
Observe pre – observe post	–2.50	5.15	.911	–2.74	31	.010	.48
Describe pre – describe post	–4.34	4.48	.793	–5.48	31	.000	1.22
Awareness pre – awareness post	–4.67	7.63	1.35	–5.69	31	.000	1.02
Nonjudge pre – nonjudge post	–7.69	5.73	1.01	–4.53	31	.000	1.03
Nonreact pre – nonreact post	–5.91	4.99	.883	–6.69	31	.000	.81

Client Perceptions of Their Mindfulness-Based Experiences

Client responses to the brief questionnaire assessing their relative state of mindfulness during their MBEs and subsequent reflections on their reasons for these perceptions were analyzed to develop a deeper understanding of how the experiences contributed to their treatment progress (Baer et al. 2006; Garland and Roberts-Lewis 2013). The clients experienced an average of 10.3 MBEs that were on average 2.8 days long. More than 350 comments were analyzed looking for consistent themes related to the five facets of mindfulness developed by Baer et al (2008) and the definition of dispositional mindfulness used in this study. Broader themes are presented in bold, and concepts related to these themes are presented in italics (Miles and Huberman 1994).

A central concept widely referenced was coded as Awareness (reflecting acting with awareness and nonreactivity), which references attending to one's activities in the moment in a nonreactive and accepting way (and is

contrasted to behaving automatically while someone's attention is focused elsewhere). Client comments reflect a focus on their actions, treatment intentions, surroundings, and the interpersonal dynamic inherent in the small-group dynamic of the MBEs. For example, one client's statement reflected on their experience by stating, "I was also aware of the dragon (a treatment term Shunda uses for negative self-thoughts and feelings emanating from the fight or flight response) coming in the second day near the end of the hike where it was taking me away from being present and I was wanting to be done but I was able to catch this thought process and turn it around." Another client stated that he "was extremely aware of [his] anxiety and had a logical conversation to become more aware of my immediate experience." Another client simply stated, "I was always present so it made my actions, thoughts and feelings to be in the moment not going away in my head creating negative space."

Another widely referenced concept was termed Being Present (reflecting nonreactivity and observing, two facets of mindfulness inherent in the FFMQ and a core concept of dispositional mindfulness). Many clients reflected on trying to remain present despite the challenging conditions (client responses are presented as they were captured which may include misspelling of words). For example, a client stated, "[I was] focusing on my breath and removing myself from the discomfort of being in the river." Another client reflected on their ice climbing trip and supported his assessment by stating, "Because I tried and worked extremely hard to remember to be present but I was very cold." Another client was reflecting on his experience trusting his belay partner climbing and stated, "It was a sad realization, but I understood and was aware I had a deep pain and that I didn't trust people anymore (Awareness and Self-Acceptance), letting that be known was a way I opened up (Openness) and accepted the help and truly thanked" (Self-Acceptance). Several client perspectives were

Table 2 Prediction of OQ-45 and OQ-45 subscale change scores from FFMQ total and respective subscale change scores

Predictor variables	<i>B</i>	<i>SE</i>	β	<i>p</i>	ΔR^2
Model 1 (OQ-45 total change score – dependent variable)					
FFMQ Mindfulness Total Change Score	–.49	.22	–.33	.03	.11
Model 2 (OQ-45 total change score – dependent variable)					
FFMQ subscale: nonjudging	–1.6	.62	.38	.01	.14
FFMQ subscale: nonreactivity	–1.4	1.2	–.22	.23	.03
Model 3 (OQ-45: subscale change score : subjective discomfort – dependent variable)					
FFMQ subscale: nonjudging	–1.1	.37	–.41	.008	.16
FFMQ subscale: nonreactivity	–.50	.71	–.12	.49	.01

also negative, reflecting on why they believed they were not being mindful. For example, one client stated that he “wasn’t focused on treatment or being present, I was pissed the whole time,” or another client who said, “I would catch myself mindlessly putting one foot in front of the other, and when I noticed I would try to bring my attention back to the here and now. Between the 2, I would say it was 50/50 between mindful and mindless.” These client reflections and hearing their perspective on mindfulness help frame the above findings on how mindfulness developed for them through time.

Interestingly, very few comments specifically related to being nonjudging of their emotions, thoughts, or feelings in the moment. Also of note is that these indirect references to the concept of nonjudging were typically in a negative frame, meaning that they were reflecting on why they believed they were not being very mindful during the experience. For example, one client stated, “I was doing everything I could to not be rude and mean—I had to focus on self-control and really couldn’t do it all the time.” Another simply stated that he “was angry with everything and swearing most of the time and didn’t see the point of this in my recovery.” Another client stated that he was upset with himself: “[because] my thoughts would occasionally spin out of control, but being outside did help me ignore them though.” One positive reflection by a client was when he stated he believed he was mindful: “[Because] I never got in a negative mindset and I was enjoying the experience and scenery.” A direct positive reference to this idea was a client who said, “[I caught myself in] anxiety and negative and bad thoughts about using which brought myself down, but I broke up that anxiety and negative thoughts and was able to deal with it.” The implications of these qualitative findings in reference to the quantitative results are discussed further and integrated into the literature in the discussion section below.

Discussion

Clients in this pilot study showed significant reductions in their presenting symptomology, as indicated by their reductions in total and subscale scores of the OQ 45.2. Clients entered treatment in the clinical range of scores and completed treatment below the cut-score with clinically reliable change (see Lambert et al. 2011). The growth and development of a global perspective of mindfulness and several facets of mindfulness implied by total and subscale score changes in the FFMQ while at Shunda and its potential relationship to treatment outcome are a promising finding and warrant further examination. Another promising finding is the significant changes found in the nonjudging and nonreactivity subscales of the FFMQ and their relationship with reductions in the client’s overall subjective distress (SD subscale of the OQ 45.2).

The development of mindfulness-related skills, as evidenced by the changes in FFMQ scores from pre- to post-treatment with moderate to large effect sizes (see Table 1), is an important finding that warrants further examination. Clients exhibited mindfulness levels post-treatment that are comparable to those in Levin et al. (2013) and others who examined the relative deficits in certain facets of mindfulness that are present in clients entering outpatient treatment with SUDs. For example, Levin et al. (2013) concluded that clients with SUDs exhibited deficits in describing, awareness, nonjudging, and nonreactivity when compared with clients with no history of SUD. Clients in the current study exhibited deficits in these areas but showed significant improvement in each of these facets as a result of treatment.

The growth and development of dispositional mindfulness and its relationship to changes in total OQ-45.2 scores add to the SUD literature and may shed light on the therapeutic mechanisms discussed by Garland et al. (2013). Although this is an exploratory study, the findings suggest a relationship between the development of dispositional mindfulness and facets of mindfulness that are related to reductions in subjective distress which promote improved well-being on the part of the client. The process described, evaluated, and studied herein, using MBEs in nature, involved repeated and focused practice of these skills in a natural and beautiful environment that is specifically designed to elicit stressors that require attention and awareness to inhibit autonomic emotional and behavioral reactions. For example, one MBE that clients engage in is a rock climbing experience that begins with a bouldering exercise at the base of the rock only a few feet of the ground. The slow and deliberate moves are designed to get them to “feel” the rock and avoid the urge to race to the top. The next sequence uses blindfolds to engage the other four senses with the experience culminating in climbing the higher more complex routes using technical gear and belay partners. Nonreactive awareness and acceptance are practiced and discussed throughout the day and related to their intentions and treatment goals.

MBEs allow clients to practice their mindfulness skills on a routine basis, reflecting on them in the moment and scaling them after the experience, relating the specific experiences to their treatment intentions and goals, and doing so in the cognitive frame of “being mindful.” Though preliminary and exploratory, this study demonstrated both quantitatively and qualitatively that the MBE process improved their mindfulness skills and that those mindfulness skills were related to reductions in the anxiety and stress and overall well-being. The relations of the mindfulness facets to the SD sub-scale of the OQ-45.2 is especially important because the scale is composed of items that have been found to reflect the symptoms of anxiety, affective, and adjustment disorders and stress-related illness. A high score indicates that the client is affected by these symptoms, which correlate highly with

various measures of depression (e.g., the Beck Depression Inventory) and anxiety (e.g., the State-Trait Anxiety Inventory). The results of this study compliment conclusions reached by Garland et al. (2010), Witkiewitz et al. (2005), Fernandez et al. (2010), and others.

Clients were also able to articulate the experience in their own words and relate it to their treatment process, which sheds light on how mindfulness works in the moment. Client perceptions of mindfulness are crucial to help researchers understand how they are using MBEs in SUD treatment contexts in the moment to facilitate awareness, nonreactivity, cognitive appraisal, and emotional regulation. Analysis of these responses also shed light on how the development of mindfulness skills, including an awareness of breathing, heart rate, anxiety, and stress activated through these experiences, helps clients link mindfulness to awareness of unregulated craving, automatic habits, drug use schema, cognitive control of craving and triggers, and attenuating physiological stress reactivity inherent with their own drug use behaviors. When a client states, “I was aware of my actions and thoughts. I am starting to identify my feelings and why I have them,” it demonstrates the iterative nature of the process of learning these skills and beginning to understand how they can work in different contexts. Another client who states, “I was aware of the mood I was feeling, and I was more controlled with the other clients because we all had to be alert and aware,” is reflecting on how a rock climbing experience helped his emotional regulation and observed a direct link to the relationship between the MBE and a key deficit inherent in a client with an SUD (awareness and emotional control).

These findings are also important when one considers the role that the development of mindfulness plays in relapse prevention. Bowen, Chawla, and Marlatt (2010) highlight how the development and subsequent application of mindfulness-based practice can aid in relapse prevention by helping clients recall positive experiences as an approach to restoring natural, nondrug-related rewards. The ability to be aware of and appreciate positive experiences, defined as savoring, is critical in relapse prevention (Bryant 1989; Quoidbach et al. 2010). The intentionally focused MBEs provided unique opportunities to develop and practice mindfulness skills in a natural environment that facilitated savoring. Client reflections on their experiences, emotions, and the “natural high” they were feeling were powerful for them, and the role they play in facilitating this process is an area for future research. Follow-up data complete with client interpretations of how their developed mindfulness has aided in their transition post-treatment is forthcoming.

There are several limitations to the study and the results should be interpreted with caution, as this is an exploratory investigation into the impact of intentional adventure experiences as an indirect mindfulness practice or MBE. As an applied evaluation project examining a specific intervention, the

study utilized no control group or random assignment; the evidence came from evaluating the practices of the program. Another limitation is the small study sample of young adult males ($N=32$) that limits the generalizability of the findings. Finally, the present study explored participants in one SUD treatment program using one specific model.

Garland et al. (2013) conclude that in contrast to mindfulness, which is indicated by elastic cognitive and behavioral processes, SUD is best characterized as “mindlessness, with responses that are habitual and scripted and deployed automatically (p. 11)” with blatant disregard to context and symmetry with personal goals. While the results of this pilot study should be viewed with caution, the data offers support for the intentional use of mindfulness-based experiences (MBEs) in nature as a promising practice that suits young adult males in SUD treatment that could help clients move from a state of mindlessness to mindfulness in hopes of leading a healthier and more productive life.

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