A Brief Mindfulness-Based Cognitive Therapy (MBCT) Intervention as a Population-Level Strategy for Anxiety and Depression

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Abstract

Mindfulness-based interventions (MBIs) have emerged as clinically effective interventions for anxiety and depression although there are significant barriers to their access in the general population. The present study examined the effectiveness of a 5-week abbreviated mindfulness-based cognitive therapy (MBCT) intervention for a physician-referred, treatment-seeking, community sample ($N = 54$) with mood and/or anxiety symptom burden. Treatment effects demonstrated significant reductions in mood and anxiety symptom severity and significant increases in general well-being. Observed effect sizes were generally large, with high response and remission rates. The present study offers preliminary support that an abbreviated MBCT protocol can offer large treatment effects for decreasing mood and anxiety symptoms and could potentially offer an effective population-level strategy to improve cost-effectiveness and access to care.

Keywords Mindfulness-based cognitive therapy (MBCT) · Mindfulness-based interventions (MBIs) · Brief intervention · Mood and anxiety symptoms · Community sample

Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to things as they are" (Williams et al. 2007). Mindfulness-based interventions (MBIs) have become

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increasingly recognized as an empirically supported approach for the treatment of anxiety and mood conditions (Hofmann et al. 2010; Khoury et al. 2013). MBIs have been officially recommended in NICE guidelines for preventing relapse of depression (NICE 2009) and there is substantial evidence from the past two decades that MBIs are efficacious for treating symptoms of anxiety disorders and depressive disorders (Hofmann et al. 2010; Khoury et al. 2013).

Despite the efficacy of evidence-based interventions like MBIs for mood and anxiety disorders, access to effective mental healthcare services in the community remains extremely challenging and is getting more difficult over time. In 2012, data from a large nationally representative survey in Canada indicated that 20% of individuals with a perceived need for mental health counselling services had their needs fully unmet and an additional 16% had their needs only partially met (Sunderland and Findlay 2013). Despite that counselling was the most frequently reported mental healthcare need, it was the least likely to be met in comparison to other mental healthcare needs such as medications (Sunderland and Findlay 2013). Access to mental healthcare counselling services appears to have worsened in Canada since 2012, given that data from a similar large nationwide survey in 2018 indicated that 35% of individuals who perceived a need for counselling services had their needs fully unmet and an additional 15.9% of individuals had their needs only partially met (Statistics Canada 2019). The decrease in access to counselling services between 2012 and 2018 does not appear to be due to increased demand for services, given that the reported prevalence of perceived need for mental healthcare in 2012 was 17% and the prevalence rate in 2018 was relatively stable at 17.8% (Sunderland and Findlay 2013; Statistics Canada 2019). Increased availability of access to mental healthcare services remains more urgent than ever, given that Canadians' perception of their own mental health status has worsened since the onset of the Covid-19 pandemic (Findlay and Arim 2020).

Although access to mental health services is challenging, it is frequently more difficult for individuals that have mild or sub-threshold symptoms to access services (Sareen et al. 2005a, b; Starkes et al. 2005). For example, a study in Atlantic Canada has suggested that successful receipt of specialist mental healthcare was most strongly associated with severity of illness in terms of chronicity of depression and suicidality, indicating high unmet mental health needs for a number of individuals experiencing low to moderate symptoms of depression (Starkes et al. 2005). Similarly, researchers have reported that individuals with "mild" mental health problems are frequently excluded from eligibility for treatment resources due to the populations' needs for treatment far exceeding available resources (Kessler et al. 2003). Thus, while access to mental health services remains a challenge for all individuals experiencing mental health problems, individuals that are "less ill" face particular difficulties in receiving access to needed interventions.

It is a common misconception that individuals with sub-threshold or mild-to-moderate mental health disorders are less in need of services. Research shows that significant numbers of individuals who perceive that they need treatment do not meet criteria for a clinical diagnosis (Sareen et al. 2005a, b). Furthermore, studies indicate that self-perceived need for treatment, compared to diagnostic status, is more predictive of days lost due to disability, long-term functional impairment, suicidal ideation, and low general well-being (Sareen et al. 2005a, b). In addition to poor quality of life and

high economic burden due to disability, individuals with sub-threshold or mild-to-moderate mood and anxiety disorders have a high risk of progressing to more severe and chronic mental illness, thus creating higher long-term burden on healthcare systems (Eaton et al. 1995; Kessler et al. 2003). Specifically, findings from the US National Comorbidity Survey indicated that "mild" mood and anxiety disorders at the time of survey were significantly predictive of hospitalization for mental health problems and diagnosis of severe mental illness at 10-year follow-up (Kessler et al. 2003).

Wide-spread lack of access to treatment services for individuals with sub-threshold and mild-to-moderate mood and anxiety disorders is unfortunate given that research suggests that these individuals highly benefit from psychological intervention (Durham et al. 2004; Eaton et al. 1995; Kessler et al. 2003). Studies have demonstrated that early psychological intervention for sub-threshold and mild-to-moderate mood and anxiety disorder symptoms can alleviate symptoms, prevent future reoccurrence of symptoms, and prevent progression of severity of symptoms (Durham et al. 2004; Eaton et al. 1995; Kessler et al. 2003; Wong et al. 2018). For example, one study found that individuals with low complexity anxiety disorders benefited more from treatment than those individuals with severe symptoms, were more likely to maintain treatment gains, and required much briefer duration of treatment to experience benefits (Durham et al. 2004). Similarly, an additional study found that individuals with sub-threshold symptoms of depression benefited from a brief psychotherapeutic treatment intervention and had significantly lower incidence rates of major depression at 1-year follow-up compared to individuals with sub-threshold depression symptoms who were not offered treatment (Wong et al. 2018). Due to demonstrated effects on quality of life, high responsivity to treatment, risk of illness progression, high economic burden, and low access to needed care, researchers have recommended and called for public health initiatives to improve access to psychological therapies for individuals that have sub-threshold and mild-to-moderate mood and anxiety disorder symptoms (Sareen et al. 2005a, b; Kessler et al. 2003).

Existing standardized MBIs, such as mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT), are typically eight sessions (2 months) in duration and delivered in group format (Segal et al. 2013; Kabat-Zinn 1991). This offers increased efficiency in terms of clinician and patient time in comparison to other evidence-based psychotherapies, when clinical efficacy is preserved. However, the clinician and patient investment remain high enough to continue to present access-to-care barriers at the population level. As such, many individuals with sub-threshold or mild-to-moderate symptoms still often do not access appropriate intervention. Interestingly, in treatment outcome studies, the treatment developers of MBCT have identified a minimum of four MBCT sessions to be "the minimum effective dose" of MBCT (Teasdale et al. 2000) even though an abbreviated version of the protocol has yet to be tested. Briefer adaptations of existing standardized MBIs such as MBCT could offer particular promise as a cost-effective means to improve access to mental health services at a population level.

There are a large number of studies investigating the effects of ultra-brief mindfulness training (e.g., ranging from one single 5-min session up to 2 weeks of daily 10-min practices) on symptoms of negative affectivity (Schumer et al. 2018). Meta-analyses have generally found very small to small effect sizes for these ultra-brief interventions (Schumer et al. 2018). However, there are very few studies investigating effects of

abbreviated versions of standardized MBIs such as MBCT or MBSR for alleviation of mood and anxiety symptoms in a community-based treatment-seeking population. Thus, dissemination of these effective interventions remains limited. Several studies have examined the effectiveness of a five-session MBCT protocol in medical students and nurses, primarily investigating outcome effects on burnout and measures of well-being, with some reported promising effects on secondary symptoms of depression and anxiety (Kim-Lan et al. 2014; MacKenzie et al. 2006; Phang et al. 2015; Pipe et al. 2009). Additional researchers have found that an abbreviated version of MBSR improves well-being in college students, though did not improve anxiety symptoms (Bergen-Cico et al. 2013), while other researchers have found promising effects on symptoms of depression and anxiety in their college student samples (Assumpcao et al. 2019; Demarzo et al. 2017; Parcover et al. 2017). Similarly, some studies have found benefits on symptoms of depression and anxiety in individuals that have chronic medical conditions (Braden et al. 2016).

To date, abbreviated versions of standardized mindfulness protocols such as MBCT or MBSR have been primarily investigated for use with nonclinical healthcare professionals and student populations. However, there is significant utility in disseminating these interventions to wider community samples and making them more accessible in resource-disadvantaged communities, if substantive effectiveness can be demonstrated in anxiety and mood symptoms. In line with this, leading clinical researchers note that there are insufficient studies investigating the effects of abbreviated interventions and a need for further research (Hofmann and Gomez 2017).

Beyond simple resource constraints, there are additional barriers at the patient and healthcare systems level that impede an eight-session MBCT intervention. For example, at the patient level, researchers (Kim-Lan et al. 2014) report improved patient attendance and treatment retention rates with an abbreviated five-session protocol in a professional nursing population, compared to the typical retention rates for eight-session protocols. Similarly, the United Kingdom (UK) has recently attempted to improve access to MBCT across their national healthcare system as part of the IAPT (Improving Access to Psychological Therapies) initiative, a stepped care system that offers a range of low-intensity to high-intensity interventions. However, Rycroft-Malone et al. (2019) report that there were many barriers to implementing standard MBCT, such that attempts to maintain integrity to the model often conflicted with administrative pressure for faster implementation. The authors further describe that the sites that were able to successfully and sustainably implement MBCT were able to do so primarily because they adapted MBCT to meet the context and needs of the clinic. This suggests that for a program to be implementable and sustainable, particularly in low-resource settings, that adaptation of existing standardized protocols is sometimes necessary for it to succeed.

The purpose of the present study was to test the preliminary effectiveness and feasibility of a brief, five-session version of the MBCT protocol for physician-referred individuals who were seeking treatment for symptoms of anxiety and depression in a community hospital–based setting. Inclusion criteria focused on self-reported symptoms and symptom-burden, as opposed to diagnostic status. As previously noted, diagnostic status may not fully reflect the severity of impairment in quality of life (QOL) for individuals with mild mood and anxiety symptoms (Sareen et al. 2005a, b). This discrepancy between diagnostic status and QOL impairment further suggests the

need for additional QOL-based measures to evaluate the effectiveness of treatment interventions. Thus, in addition to primary symptom measures, the present study included several QOL indices to evaluate treatment effectiveness.

Measures of disability-related impairment, general well-being, and acute distress were chosen as secondary outcome measures based on available data that these areas are significantly impaired for individuals with mood and anxiety symptoms (Sareen et al. 2005a, b) and also based on research demonstrating that mindfulness generally improves individuals' sense of well-being and lowers distress (Carmody and Baer 2008; Chambers et al. 2008; Hofmann et al. 2010; Moore and Malinowski 2009). Self-compassion was chosen as an additional well-being outcome measure based on literature demonstrating that it increases overall sense of well-being (Zessin et al. 2015) and that it is a potential mediator of MBIs (Kuyken et al. 2010).

Standardized mindfulness interventions have been shown to have moderate to large effect sizes for reduction of anxiety and depression symptoms (Hofmann et al. 2010; Khoury et al. 2013). Similarly, single-session mindfulness sessions have been shown to have significant beneficial effects for anxious and depressive symptoms, albeit with a small effect size (Schumer et al. 2018). The authors hypothesized that the abbreviated mindfulness intervention would have a beneficial effect on symptoms of depression and anxiety and predicted an effect size somewhere between what is seen for single-session vs. longer standardized mindfulness interventions (e.g., the higher end of the moderate range). A large dismantling study of standardized MBCT indicated that the primary mechanisms by which MBCT exerts its effects on depressive symptoms are via increased self-compassion and increased mindfulness (Kuyken et al. 2010). Researchers therefore hypothesized that any observed reductions in depressive and anxious symptom measures would be correlated with increases in self-compassion, mindfulness, and general well-being.

Methods

Participants

Participants were recruited from the Mindfulness-Based Therapy Clinic at Sunnybrook Health Sciences Centre. The intervention thus took place within a general hospital community setting and was focused on a sample of physician-referred treatment-seeking individuals with symptom burden. Symptom-based inclusion criteria were used as this is increasingly the standard for population-level strategies, such as the IAPT initiative in the UK, New Access in Australia, and the emerging Ontario Structured Psychotherapy program ("Mindability") in Canada (Clark et al. 2009; Leitch et al. 2016; Government of Ontario 2020).

Inclusion criteria required that participants (1) were ≥ 18 years of age, (2) were referred to the mindfulness group by a physician, and (3) had a GAD-7 score ≥ 5. The score of five on the GAD-7 was chosen as a cutoff point for inclusion criteria because this represents a cutoff score for "mild anxiety" symptoms recommended by the scale's authors (Spitzer et al. 2006). The threshold for GAD-7 symptoms was set as relatively low to avoid excluding any participants that, according to both the participant and their physician, met sufficient levels of distress and QOL impairment to warrant intervention.

Participants were excluded from the study if they (1) had previously completed a full (≥ 8-week) MBI in the past 3 years, (2) met criteria for substance abuse, psychosis, and/ or mania, or (3) expressed active suicidality. Individuals that expressed active suicidality were directed to appropriate resources, including being escorted to an emergency department if necessary. Individuals that did not meet the study eligibility criteria for GAD-7 symptom scores, but otherwise met the inclusion criteria, were still offered the opportunity to participate in the mindfulness group but were not included in the present study. Individuals were not specifically screened for prior CBT or history of additional therapeutic modalities, given that all individuals presenting for treatment were currently experiencing symptoms and symptom burden and therefore any observable benefits of the intervention could not be attributed to past treatments.

Procedure

This study was approved by the Sunnybrook Research Ethics Board and was therefore performed in accordance with the ethical standards from the 1964 Declaration of Helsinki and its later amendments. All participants were individuals seeking help for anxiety or depression symptoms and were referred to the study by their primary care physician. All participants were then screened for inclusion/exclusion criteria. The symptom-based measures were administered and scored by a research assistant familiar with the administration, scoring, and cutoff thresholds for each measure and the research assistant was supervised by a senior-level psychiatrist. All participants provided written informed consent for participation and they did not receive financial compensation. Participants completed the brief five-session MBCT intervention and completed pre- and post-treatment assessment measures. Treatments were delivered by a senior-level physician who has a history of running mindfulness interventions for anxiety and mood conditions in the community hospital context.

Measures and Materials

Symptom Measures

Generalized Anxiety Disorder-7 The Generalized Anxiety Disorder-7 (GAD-7) is a 7-item self-report measure that assesses the presence of generalized anxiety symptoms within the past 2 weeks. Response options range from 0 (not at all) to 3 (nearly every day). The original validation study of the GAD-7 noted adequate sensitivity and specificity for identifying not only GAD, but also high sensitivity and specificity as a screening method for other anxiety disorders (Spitzer et al. 2006). The GAD-7 therefore has been operationalized in past research as a general measure of anxiety symptom severity.

Beck Anxiety Inventory The Beck Anxiety Inventory (BAI) is a 21-item self-report measure that assesses the presence of anxiety symptoms within the past month (Beck and Steer 1993). Respondents are asked to rate how much they have been bothered by each symptom on a scale from 0 to 3, which corresponds to Likert response options of "not at all" to "severely." Internal consistency estimates for the BAI have been found to be 0.92 in general psychiatric samples (Beck et al. 1988a, b) and 0.85 to 0.93 in anxiety disorder patients (Beck and Steer 1993).

Beck Depression Inventories I and II The Beck Depression Inventory-II (BDI-II) is a 21-item self-report measure that assesses the presence of depressive symptoms within the past 2 weeks (Beck et al. 1996). Each item is rated from 0 to 3. There is considerable data on the validity and reliability of this measure across various populations (Wang and Gorenstein 2013). The original Beck Depression Inventory contains the same number of items and scoring procedures compared to the second edition and also has high reported validity and reliability (Beck et al. 1988a, b). A subset of the present sample ($n = 17$) received the original version of the BDI, rather than the second edition. A small subset of the sample received a different version of the BDI at baseline vs. follow-up ($n = 5$). Studies indicate high convergent validity between the original and second edition of the BDI, with correlation coefficients ranging from $r = 0.82$ to $r = 0.94$ (Wang and Gorenstein 2013). Given the high convergent validity and similarities between both editions of the BDI, scores from either version are included in the final data analyses and treated as one variable. Both versions of the BDI that were administered as part of this study asked participants to rate symptoms only over the past week.

Well-Being Measures

Self-Compassion Scale Short-Form The Self-Compassion Scale Short-Form (SCS-SF) is a 12-item self-report measure of self-compassion that represents a shortened version of the 24-item Self-Compassion Scale by Kristin Neff (Raes et al. 2011). The SCS-SF is reported to have high convergent validity with the original Self-Compassion Scale, and high validity and reliability (Raes et al. 2011).

Perceived Stress Scale The Perceived Stress Scale (PSS) is a 10-item measure that assesses perceived stress within the last month. It is frequently used as a measure of acute distress; thus, this measure is expected to be inversely related to positive well-being. The PSS is reported to have good reliability and validity (Cohen et al. 1983).

Warwick-Edinburgh Mental Well-Being Scale The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) is a 14-item measure that assesses positive well-being within the last 2 weeks. It is noted to have good reliability and validity (Tennant et al. 2007).

Sheehan Disability Scale The Sheehan Disability Scale (SDS) (Sheehan 1983) assesses the extent that an individual's disability has disrupted their work/school, social life, and family life/home responsibilities. Respondents are asked to rate each of these impairments on a scale of 0 (not at all) to 10 (extremely). Additional questions prompt for self-report of work/school days lost due to disability and work/school days that were unproductive due to disability. For individuals that are not currently working or attending school for reasons unrelated to their disability, there is an option to indicate that these questions are not applicable.

Clinically Significant Change

Clinically significant changes in depression (BDI-II), anxiety (BAI), and worry (GAD-7) were defined by determining treatment response and treatment remission cutoffs for

each of these outcome measures. Treatment response for each variable was defined as a 30% reduction in symptoms from pre- to post-treatment. Treatment remission for each variable was defined as a 50% reduction in symptoms from pre- to post-treatment. Although the depression literature suggests different values for defining treatment response and remission, the present values were used for all measures to make it easier to compare treatment outcomes across the different symptom categories.

Abbreviated MBCT Intervention

Participants took part in an adapted and abbreviated version of the traditional 8-week MBCT protocol. Participants met for five, weekly, 2-h sessions. The group size was larger than traditional MBCT groups (i.e., 16–20 participants rather than 12 participants). The reduction in number of sessions, the elimination of the "day of mindfulness" in MBCT, and the expansion of group size contributed to an overall reduction in clinician time. The adaptation used a transdiagnostic approach for treating current psychological symptoms. Additional key deviations from MBCT and a more detailed description of each session are provided below.

Length, Number, and Focus of Meditation Practices Meditation practices were 10–15 min in length, rather than 40 min in traditional MBCT. For this reason, the recommended time for home practice was 15–20 min per day, rather than an hour in traditional MBCT. The 5-week mindfulness intervention was also streamlined to focus on three core mindfulness meditation practices:

1) Mindful movement: this practice was a brief stretching meditation in which participants were invited to bring awareness to bodily sensations and psychological reactions as they moved their bodies. This meditation is a modification of mindful movement used in MBCT, with a focus on further simplifying the movements to reduce barriers to participation. Movement was particularly chosen to support awareness of bodily sensations as it generates sensations (compared to a body scan which relies on more subtle arising sensations); it was also chosen for practical secondary anti-anxiety and anti-depressant effects associated with movement (Yang and Conroy 2018).

2) Mindfulness of breath, body, sound, thought, emotion, and open awareness: this was a 10-min sitting meditation that was referred to as "Cultivating Awareness," thematically similar to a traditional MBCT sitting meditation. Both the movement and sitting meditations were used in each session and participants were invited to practice both meditations daily as part of their home practice. "Cultivating Awareness" was recorded for participants to use at home. After the first 2 weeks of the intervention, "Cultivating Awareness" was replaced with "Cultivating Awareness 2: Deepening the Practice," which followed the same structure but with less instruction in order to give participants more opportunity to lose awareness and practice resetting intentions to bring awareness to experience.

3) "Awareness Moments": these very brief practices (a few moments each), introduced in the second session, were very similar to the "Breathing Spaces" used in MBCT but simplified to focus on bringing awareness to experience and opening up space for choiceful response.

The primary purpose of the noted modifications was to reduce barriers to therapeutic engagement. Unnecessarily long meditations can decrease participants' willingness to engage in meditation and can increase the extent to which participants' inadvertently practice nonmindful intentions such as striving or self-criticism. This can be particularly true of meditations which emphasize attention control, which is a goal-oriented activity that can encourage striving and judging of "success" or "failure." Experts in mindfulness have noted that individuals new to mindfulness meditation frequently get stuck in striving, self-criticism, and discouragement in response to attention control exercises (Shapiro et al. 2018). Research also suggests that up to 25% of individuals experience adverse effects from meditation and that adverse reactions most frequently occur when meditations are longer in length (e.g., > 20 min) and are more likely to occur in practices that emphasize focused attention (Cebolla et al. 2017).

Daily Home Practice Using a CBT-informed framework, participants were invited and encouraged to complete daily home practice and to track their practice on tracking sheets, though the tracking sheets were deliberately not monitored by the clinicians to further de-emphasize goal orientation and promote nonstriving and nonattachment to a specific outcome. The daily home practice emphasized five approaches represented by the acronym "AWARE": (1) Arriving in the body through movement (stretching meditation); (2) Welcoming experience through formal (recorded) meditation practice; (3) Awareness throughout the day; (4) Reading and reflecting on handouts and course content; and (5) Exploring and experimenting by choosing experiences each day to explore through mindfulness.

Session Content

A unifying theme across the sessions is the eastern and western psychological principle that suffering can be seen as comprised of inevitable physical and emotional pain (referred to as "first arrows") as well as distress that is generated through attitudes toward, and relationship with, those "first arrows." Generated distress ("additional arrows") is seen as modifiable and reduceable by cultivating a different relationship to the arising difficulties of life. These additional layers of distress are seen as a key factor in converting normative anxiety and sadness into pathological levels of anxiety and depression. The intervention therefore aims to help participants cultivate the awareness, flexibility, and choice to relate differently to inevitable difficulties, thereby reducing unnecessary distress. Attitudes and relationships to experience that are less distressogenic are cultivated and progressively deepened across the intervention.

Session 1 The first session focuses on cultivating awareness of phenomenological components of experience and our reactions to those phenomena; for instance, through meditation, participants are encouraged to bring awareness to physical sensations, emotions, urges, and thoughts, as well as any associated mental and physical reactions. Much like in other mindfulness-based cognitive approaches, one aim is to foster the metacognitive awareness that could, in time, facilitate the development of different cognitive interpretations and relationships with phenomena. Meditation, inquiry, discussion, whiteboard exercises, and written material are used to support the development

of direct phenomenological awareness, as well as awareness of the distressogenic patterns and reactions to these phenomena. MBCT uses CBT-informed approaches to reinforce what is being learned through meditation and inquiry. For instance, participants engage in induction exercises that facilitate recognition that the emotion someone experiences in a given situation is dependent on their cognitive interpretation of that situation. Similarly, participants are often given lists of automatic thoughts, cognitive distortions, and maladaptive appraisals to facilitate identification and labeling of distressogenic paterns. This abbreviated intervention makes similar use of CBT-informed discussion, whiteboard exercises, and written material that support the identification and labeling of these distressogneic patterns. In the first session, a CBT-informed induction exercise called "Walking barefoot on a beach" was used to elicit automatic reactions to suddenly stepping on a piece of sharp glass amidst a beautiful environment. In addition to the physical pain of a cut foot, participants typically expressed reacting to this unpleasantness with added frustration, anger, disappointment, self-criticism, or anxiety. This exercise was used to facilitate the awareness and understanding of how we can inadvertently add distress to pain by how we relate to it, as well as by turning attention away from pleasant aspects of the environment. Later in this session, participants were introduced formally to lists of "thinking patterns" and "mental activities" such as "worrying, ruminating, judging, criticizing, analyzing, story-telling, and controlling" with links made to their distressogenic properties.

Session 2 The second session focused on deepening the awareness of relationship to phenomena, emphasizing that how one relates to phenomena can dictate whether or not additional layers of distress are added. Foci of exploration included relationship to emotions, urges, thoughts, and sensations. Meditation, inquiry, whiteboard exercises, and discussion were used to identify distressogenic consequences of avoiding or suppressing unpleasant phenomena like emotions or thoughts and of discounting the useful information carried by those phenomenological experiences. For example, participants were introduced to adaptive functions of unpleasant emotions such as sadness, i.e., that sadness can inform us that we are interpreting a certain situation as a loss. Attempting to avoid or suppress an unpleasant emotion like sadness does not change the underlying interpretation of loss and often generates additional distress. Alternatively, allowing the emotion to be present can open up the space to respond more adaptively. Similarly, maladaptive relationships to urges were identified, be it acting on maladaptive urges or suppressing adaptive ones. Principles were introduced regarding relationship to thoughts, such as "thoughts are not facts" and "we are not our thoughts". Participants were also supported in recognizing particularly common patterns of overestimation of threat, self-criticism, and treating wants as needs. In contrast to MBCT which is not explicit about self-compassion, session two of this intervention discussed self-compassion explicitly, referencing the work of Kristin Neff, and also explored relationship with others.

Session 3 Session three focused on deepening the capacity to recognize different ways of relating to phenomenological experience and the impact of relating in those ways, increasing the possibility of choosing how to relate. It introduced three "operating modes" or ways of relating to and interacting with phenomena: the protection mode (a pattern of cognitively, emotionally, and behaviourally relating to perceived danger,

with an emphasis on saving oneself or others); the provision mode (a goal-oriented, appetitive pattern rooted in meeting needs); and the attunement mode (a pattern available in the absence of danger or need, which is characterized by orientations such as curiosity, openness, exploration, play, acceptance, befriending, and compassion). Although not used explicitly in MBCT sessions, the MBCT literature refers to two "modes of mind," "driven-doing" and "being," to distinguish a goal-oriented pattern of conceptualizing and striving from a direct and nonjudgmental presence. In this abbreviated adaptation, the "operating modes" are used explicitly to support relational pattern recognition and increased freedom to move among different modes. "Provision" and "attunement" replace "driven-doing" and "being," rooting these modes more clearly in evolutionary psychology and removing conflation with activity vs. passivity, since both modes contain both active and passive elements. The "protection mode" is added for completion and to enhance the transition of this intervention from MBCT's focus on depression to a broader, transdiagnostic approach.

Session 4 Session four supported deepening of personal application of experiential learnings, using meditation, inquiry, and exercises to facilitate participants' recognition of their "personal patterns" that are either most contributory to their suffering or most amenable to change.

Session 5 Session five focused on consolidation of experiential learning and carrying the mindful practice forward so as to continue cultivating awareness, flexibility, and choice in relating to experience.

Statistical Analysis

Paired sample *t*-tests were conducted for each of the outcome variables. Standardized residual change scores were computed for each outcome measure by conducting a linear regression using the pre-test scores as the independent variable and the post-test scores as the dependent variable.

Logistic regressions for treatment response and treatment remission for each primary outcome measure were conducted, with each treatment response and treatment remission variable serving as the binary dependent variable and the standardized residual change scores for self-compassion entered as an independent variable in each model.

Results

Participant Demographic Information A total of 54 eligible participants consented to participating in the present study, completed the intervention, and completed the pre- and post-treatment questionnaires. Participants completed a minimum of 3/5 of the intervention sessions. The mean age of the sample was 47.51 years (SD = 17.55). 57.4 % of the sample identified as female, 31.5% identified as male, and 1.9% identified as other. Furthermore, 46.3% of participants were employed full-time, 16.7% part-time, and 27.8% were unemployed/on disability leave/retired. Additionally, 24.1% of the sample were single, 53.9% were married/common-law, and 13.1% were separated/

divorced/widowed. Participants identified themselves as Caucasian (77.8%), Asian (3.7%), Black (1.9%), Hispanic (1.9%), and other (5.6%). Demographic information is missing for five participants; thus, percentages for each variable do not add up to 100%.

Paired sample t-tests were conducted for each of the outcome variables. Table 1 presents the means, standard deviations, t-scores, significance level, and effect sizes for each outcome variable. Missing values for single items on a questionnaire were estimated by obtaining the mean of the individual's responses for all items on the questionnaire. In cases where a participant gave two responses for an item that asked for only one response, the mean of the two responses was used.

Measures

Anxiety Measures There were significant reductions in anxiety (BAI), $t(53) = 5.33$, $p < 0.001$, $d = 0.73$, and worry (GAD-7), $t(53) = 8.49$, $p < 0.001$, $d = 1.16$, from pre- to post-treatment. Based on Cohen's d, effect sizes can be described as small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) (Cohen 1988). Thus, a medium effect size was observed for reduction in anxiety (BAI) and a large effect size was observed for reduction in worry symptoms (GAD-7).

Depression There were significant reductions in depression (BDI-II), $t(51) = 6.86$, $p < 0.001$, $d = 0.95$, from pre-to post-treatment. A large effect size ($d = 0.95$) was observed for treatment effects on depression.

Well-Being Measures There were significant increases in self-compassion (SCS-SF), $t(53) = -6.24$, $p < 0.001$, $d = 0.84$, and mental well-being (WEMWBS), $t(53) = -7.26$, $p < 0.001$, $d = 0.99$, from pre- to post-treatment. Acute distress, as measured by the PSS, also significantly decreased from pre- to post-treatment, $t(53) = 6.98$, $p < 0.001$, $d = 0.95$. There was a large effect size for each indicator of well-being.

Table 1 Mean, standard deviations, T-values, and effect sizes for outcome measures

| Measures | Pre-treatment | | Post-treatment | | | |
	M	SD	M	SD	t	d
BAI	19.95	11.32	14.62	9.87	5.33***	0.73
GAD-7	10.81	4.34	6.11	3.89	8.49***	1.16
BDI-II	20.14	10.16	11.21	8.13	6.86***	0.95
SCS-SF	2.58	0.70	3.15	0.64	− 6.24***	0.84
WEMWBS	40.25	8.52	47.09	8.07	− 7.26***	0.99
PSS	22.44	6.35	16.68	5.97	6.98***	0.95

BAI, Beck Anxiety Inventory; *GAD-7*, Generalized Anxiety Disorder 7-Item Scale; *BDI-II*, Beck Depression Inventory II; *SCS-SF*, Self Compassion Scale Short-Form; *WEMWBS*, Warwick-Edinburgh Mental Well-being Scale; *PSS*, Perceived Stress Scale

*$p < 0.05$, **$p < 0.01$, *** $p < 0.001$ two-tailed

Clinically Significant Change 66.7% of the sample had a treatment response for their worry symptoms (GAD-7), while 40.7% of the sample experienced treatment remission for these symptoms. 61.1% of the sample reported treatment response in their depressive symptoms (BDI), with a total of 50% reporting treatment remission. Finally, 46.3 % of individuals in the study indicated treatment response for their anxiety symptoms (BAI), with a total of 20.4% reporting treatment remission.

Exploratory Analyses of Variables Associated with Clinical Response The bivariate correlations between each measure's residual change scores are presented in Table 2. As expected, there were significant inverse correlations between the primary symptom outcome measures' residualized change scores and the general well-being indicators' residualized change scores, such that as anxiety, worry, and depressive symptoms decreased, self-compassion and mental well-being increased. Similarly as anxiety, worry, and depressive symptoms decreased, perceived stress also significantly decreased. Reductions in burden of patients' psychiatric symptoms (SDS subscales measuring home/family impairments and social impairments) were significantly correlated with general increases in well-being (self-compassion, mental well-being, and reduced perceived stress) and general reductions in some of the clinical symptom measures.

A test of the full logistic regression model vs. a model with intercept only was statistically significant for anxiety (BAI) treatment response, $\chi^2(1, N = 54) = 11.41, p < 0.01$, and remission, $\chi^2(1, N = 54) = 8.60, p < 0.01$; depression (BDI-II) treatment response, $\chi^2(1, N = 52) = 11.50, p < 0.01$, and remission, $\chi^2(1, N = 52) = 14.67, p < 0.001$; and worry (GAD-7) treatment response, $\chi^2(1, N = 54) = 5.47, p < 0.05$, and remission, $\chi^2(1, N = 54) = 9.17, p < 0.01$. Table 3 shows the logistic regression coeffiients, Wald test, and odds ratios for self-compassion within each regression model.

Discussion

The adapted, brief MBCT intervention in the current study produced large treatment effects on indices of worry and depressive symptoms, and moderate effect sizes for reductions in anxiety symptoms. Notably, these effect sizes are comparable to reported effect sizes for the full eight-session MBCT program (Hofmann et al. 2010) in clinically diagnosed mood and anxiety samples. Importantly, the moderate to large effect sizes found for the lower-intensity version of MBCT in the present study are also comparable to known effect sizes for low-intensity CBT interventions for individuals with mood and anxiety disorders (Den Boer et al. 2004). The present study suggests that adapted versions of standardized MBIs such as MBCT may offer a promising option as a brief intervention within public healthcare systems. This adaptation might also further reduce the barrier of stigma associated with seeking mental healthcare given its transdiagnostic framework, and nondiagnostic content opens the intervention to participation by those who are reluctant to disclose mental illness. By preserving moderate-to-large effect sizes at a substantially lower investment of clinician and patient time, this adaptation may prove to be an important addition to a broader stepped care population-level strategy if supported in randomized control trial research.

Table 2 Bivariate correlations between all outcome measures' residualized change scores

	BAI	GAD-7	BDI-II	SCS-SF	WEMWBS	PSS	Social impairment	Home and family impairment	School/work impairment
BAI	—	0.43**	0.67***	− 0.42**	− 0.50***	0.56***	0.15	0.15	0.39*
GAD-7	—	—	0.52***	− 0.46***	− 0.51***	0.55***	0.32	0.08	0.47**
BDI-II	—	—	—	− 0.61***	− 0.67***	0.53***	0.42*	0.39*	0.69***
SCS-SF	—	—	—	—	0.55***	− 0.57***	− 0.43**	− 0.43**	− 0.24
WEMWBS	—	—	—	—	—	− 0.68***	− 0.50**	− 0.43**	− 0.38*
PSS	—	—	—	—	—	—	0.38*	0.26	0.37*
Social impairment	—	—	—	—	—	—	—	0.71***	0.42*
Home/family impairment	—	—	—	—	—	—	—	—	0.42*
School/work impairment	—	—	—	—	—	—	—	—	—

BAI, Beck Anxiety Inventory; *GAD-7*, Generalized Anxiety Disorder 7-Item Scale; *BDI-II*, Beck Depression Inventory II; *SCS-SF*, Self Compassion Scale Short-Form; *WEMWBS*, Warwick-Edinburgh Mental Well-being Scale; *PSS*, Perceived Stress Scale

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ two-tailed

Table 3 Logistic regressions predicting treatment outcomes from residualized change in self-compassion scores

Dependent variable	Independent variable	B	Wald χ^2	EXP(B)
BAI treatment response	Self-compassion	− 1.12	8.26	0.33**
BAI treatment remission	Self-compassion	− 1.12	6.95	0.33**
GAD-7 treatment response	Self-compassion	− 0.76	4.59	0.47*
GAD-7 treatment remission	Self-compassion	− 0.97	7.15	0.38**
BDI-II treatment response	Self-compassion	− 1.22	7.90	0.30**
BDI-II treatment remission	Self-compassion	− 1.38	9.34	0.25**

BAI, Beck Anxiety Inventory; *GAD-7*, Generalized Anxiety Disorder 7-Item Scale; *BDI-II*, Beck Depression Inventory II; *SCS-SF*, Self Compassion Scale Short-Form; *WEMWBS*, Warwick-Edinburgh Mental Well-being Scale; *PSS*, Perceived Stress Scale

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

While it is unclear why there was a larger effect size for worry compared to general anxiety, there are notable differences in the reporting period for these symptom measures. The GAD-7 measures worry over the past 2 weeks, whereas the BAI measures symptoms over the past month. Thus, it is possible that the higher effect size found for worry reflects the fact that patients only reported on their worry symptoms for the last 2 weeks of treatment, a time when one might expect the highest cumulative treatment gains. This would also be somewhat consistent with the finding that reduction in depression symptoms over the past week had a large effect size, though there is no equivalent measurement of depressive symptoms over the past month to compare the effects of short-term vs. long-term change in symptoms. More research is needed to clarify the differential impact of abbreviated MBCT interventions on short-term vs. long-term measurements of anxiety and depression symptoms.

The present study also explored whether self-compassion changed over the course of treatment and if these changes were related to changes in negative affectivity. Changes in self-compassion from pre- to post-treatment significantly predicted clinically significant response to the abbreviated MBCT intervention, in terms of reduction and remission of both anxiety and depressive symptoms. This is consistent with existing research that one of the primary ways that MBCT reduces depressive symptoms is through indirect acquisition of self-compassion (Kuyken et al. 2010). It appears that the indirect acquisition of self-compassion through MBCT works transdiagnostically to reduce additional symptoms of worry and anxiety. However, this relationship needs to be further examined and established in future studies, given that the present study does not permit for a mediation analysis to establish causality.

In addition to reducing psychiatric symptoms, the brief MBCT intervention increased patient well-being. There were significant increases in general mental well-being and self-compassion and decreases in perceived stress. This is consistent with research conducted with nonclinical professional groups showing that MBCT lowers perceived stress (Kim-Lan et al. 2014). It is also consistent with broader literature that mindfulness improves patient well-being (Carmody and Baer 2008). The brief MBCT intervention also significantly reduced the severity of patient-rated impairments in home/family life and social life as a result of their psychiatric symptoms. The

intervention also significantly reduced impairment in work/school life, although this result should be interpreted cautiously because a significant number of individuals in the sample were not working due their disability both before and after the intervention, meaning that the results are biased for this specific facet of the SDS. Surprisingly, reductions of patient impairment in home/family life and social life were more consistently correlated with improvements in well-being (self-compassion, general mental well-being, and lower perceived stress) compared to symptom alleviation of depressive, anxious, or worry-based symptoms. This suggests that alleviation of mental health symptoms in itself is not necessarily sufficient to improve major areas of functioning and that acquiring positive coping skills, such as self-compassion, may be key to translate symptom improvements to real-life changes.

There are several limitations to the present study. First, in the absence of a control condition, it is not entirely determinable whether the observed treatment effects were due to the active experimental condition or some other factor. Larger randomized control trials are needed to further clarify the effectiveness of abbreviated MBCT. Second, the present study did not control for changes in medication use that could have taken place during the course of the study. However, all participants were seeking psychological interventions as opposed to medication consultations, and the brief nature of the intervention may reduce the likelihood that medications confounded the post-intervention outcomes. An additional limitation is that the study protocol was delivered by a lone physician as opposed to a team of trained MBCT clinicians that could directly control for therapist variance in relation to treatment outcomes. However, the treatment was delivered in a context where previous RCT trials have been conducted and where multiple MBCT clinicans have been shown to produce equivalent outcomes (Selchen et al. 2018), thus suggesting the clinical benefits of MBCT in this study are due to the treatment protocol rather than a unique aspect of the treating clinician.

A further limitation is that the symptom measure administered for depression only measured depressive symptoms over the past week; thus, the study cannot comment on whether the reductions in depressive symptoms were acquired and sustained over the course of the entire 5-week treatment or whether changes primarily took place near the end of treatment. Though this limits what can be inferred regarding the way that changes in depression symptoms unfold over the course of treatment, it remains promising that such large effect sizes were observed in reduction of depressive symptoms from pre- to post-treatment. Though additional follow-up data was not obtained, this was beyond the scope of an initial pilot study and the longevity of treatment gains should be more thoroughly investigated in a larger study. Inclusion criteria were also based on the GAD-7, which could have resulted in the exclusion of some participants that met criteria for depression on the BDI but did not have concurrent anxiety symptoms. Lastly, criteria were symptom-based rather than diagnosis-based, limiting the ability to generalize the results to populations that include exlusively clinically diagnosed individuals. However, MBIs are underresearched in community samples that include a full range of clinical symptoms. Wider dissemination of these effective mental health interventions is needed to include individuals that experience mild to moderate symptoms of mood and anxiety disorders.

Briefer protocols of standardized mindfulness interventions such as MBCT offer promise for increasing accessibility to high-impact mental health interventions in

nonclinical community settings by lowering stigma, maximizing cost-effectiveness, and offering low clinician-client time ratios that could increase access in rural areas and more disadvantaged communities. The pilot research here needs to be buttressed with more sophisticated, rigorous, RCT frameworks to evaluate briefer MBIs as a population-level strategy for anxiety and depression symptoms.

Declarations

Conflict of Interest   The authors declare no competing interests.

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