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Outcomes following Mindfulness Based Cognitive Therapy in a Heterogeneous  
Sample of Adult Outpatients

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### Abstract

Research on Mindfulness-Based Cognitive Therapy (MBCT: Segal, Williams, & Teasdale, 2002*a*) has supported the effectiveness of this approach for use with preventing relapse in recurrent depression. This study evaluated the use of MBCT in a heterogeneous sample of 26 psychiatric outpatients with mood and/or anxiety disorders. Results from both completer and intent to treat analyses showed that MBCT was associated with statistically significant improvements in depression, anxiety, stress, and insomnia symptoms. Rates of clinically significant improvement were comparable with effectiveness studies of Cognitive Behaviour Therapy and Mindfulness Based Stress Reduction in heterogeneous samples. It is concluded that MBCT may be of value for a range of psychological presentations, administered in heterogeneous groups. Future, controlled, research is required to further evaluate this conclusion and to investigate mechanisms of change.

It has been estimated that one in five Australians will experience a mental illness in their lifetime. An important issue in Australia is that two thirds of people with anxiety and depression never access effective treatment (CRUFAD, 2006). Mindfulness Based Meditation as an approach to psychological treatment has, in recent years, become increasingly popular and well researched. Mindfulness group\_based approaches to therapy may potentially increase the number of people who are able to access treatment as more people are able to attend treatment (e.g., up to 30 people in a group at one time), compared to standard psychological treatments that are usually applied on an individual basis in mental health services. Mindfulness based approaches may also have the advantage of being able to treat patients with many different diagnoses in the same group, compared to other psychological treatments which may necessitate treating different disorders separately. Another important practical advantage is that Mindfulness does not rely on patients being literate to the same degree as cognitive therapy.

Mindfulness itself has been defined as “the awareness that emerges through paying attention on purpose, in the present moment, and non judgmentally to the unfolding of experience moment by moment” (p.145 Kabat-Zinn, 2003). In line with this definition, recent research has proposed that mindfulness consists of a number of facets, such as non-reactivity, observational awareness, acting with awareness and concentration, describing, and a non-judgement attitude towards experience (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). In relation to the benefits that more mindful responding in life may confer, research conducted by Brown and Ryan has demonstrated that trait based mindful awareness is associated with reduced psychological distress and improved well being in cancer patients. Baer et al. (2006) have also recently shown that a non-judgemental attitude toward experience is associated with measures of lower psychological disturbance and

difficulties with emotion regulation, and greater emotional intelligence and self-compassion.

The two most widely employed and evaluated Mindfulness-Based Therapies that aim to increase mindful responding are Mindfulness Based Stress Reduction (MBSR: Kabat-Zinn, 1990) and Mindfulness-Based Cognitive Therapy (MBCT: Segal, et al., 2002*a*; Segal, Williams, & Teasdale, 2002*b*). Mindfulness Based Stress Reduction is the first and most widely evaluated structured mindfulness meditation program. It draws from Buddhist insight meditation techniques and was initially developed in the behavioural medicine field and conducted in a general hospital setting. The program is conducted as an 8 week x 2.5 hour course in which mindfulness meditation skills are taught and practiced and coping with distress is discussed. For all mindfulness meditation exercises, participants practice focussing their attention (e.g., on a sound, visual stimulus, physical sensation, body part, or breathing) and being aware of each moment at the same time as noticing their thoughts and feelings, but not becoming absorbed in their content (Kabat-Zinn, 1990).

Mindfulness Based Stress Reduction has demonstrated efficacy with several medical conditions including chronic pain (e.g., Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985), distress associated with cancer, (Carlson & Garland, 2005; Shauna Lin Shapiro, 2002; Speca, Carlson, Goodey, & Angen, 2000), psoriasis (Kabat-Zinn et al., 1998), chronic fatigue syndrome, (Pauzano-Slamm, 2005), fibromyalgia (Weissbecker et al., 2002). For example, one randomized clinical trial showed that patients with moderate to severe psoriasis undergoing phototherapy or photochemotherapy and who listened to guided meditation tapes while receiving the ultraviolet light treatments healed at approximately four times the rate of subjects receiving just the light treatments (Kabat-Zinn et al., 1998).

Mindfulness Based Stress Reduction also has demonstrated effectiveness with a range of psychological presentations including substance abuse (Breslin, Zack, & McMMain, 2002), eating disorders, (Kristeller, Baer, & Quillian-Wolever, 2006), insomnia (Shapiro, Bootzin, Figueredo, Lopez, & Schwartz, 2003), anger management (Diebold, 2004) and the anxiety disorders (Miller, Fletcher, & Kabat-Zinn, 1995; Singh, Wahler, Winton, & Adkins, 2004; Tacón, McComb, Caldera, & Randolph, 2003; Tory, 2004). See Bear (2003) for a review and Grossman et al. (2004) for a recent meta-analysis. A small number of studies evaluating Mindfulness-based approaches with heterogeneous populations have also yielded comparable effects to studies of homogeneous groups (Majumdar, Grossman, Dietz-Waschkowski, Kersig, & Walach, 2002; Reibel, Greeson, Brainard, & Rosenzweig, 2001). For example, Reibel, et al (2001) examined the effects of mindfulness-based stress reduction (MBSR) on health-related quality of life and physical and psychological symptomatology in a heterogeneous patient population (N = 136). Health-related quality of life was enhanced as demonstrated by improvement on all indices. Significant alleviation of physical symptoms and psychological distress were also revealed and maintained at one-year follow-up.

More recently, MBCT has been developed with the aim of reducing the risk of relapse in recurrent depression. Teasdale, Segal, and Williams (1995) proposed that the skills of attentional control taught in mindfulness meditation can help individuals recognise and step out of rumination based processing triggered by dysphoric states that can ultimately lead to depression. Mindfulness-Based Cognitive Therapy is a manualised 8-week group program based largely on Kabat-Zinn's (1990) MBSR program. The core skill learned is to disengage from self-perpetuating patterns of negative thinking. In addition to the meditative skills taught in the MBSR program, MBCT incorporates elements of cognitive therapy that facilitate a detached and non judgemental view of negative thoughts,

including statements such “Thoughts are not facts” and “I am not my thoughts.” Other elements of Cognitive Therapy are included such as teaching participants about the link between thoughts and feelings, and about critically evaluating thoughts rather than seeing them as facts. It also explicitly focuses on the identification of ‘warning signs’ of impending relapse and demonstrates how patients can look after themselves when distress threatens to overwhelm them. Patients learn to stay in touch with the present moment, without having to ruminate about the past, or worry about the future.

Mindfulness-Based Cognitive Therapy has demonstrated effectiveness in preventing relapse in recurrent depression in a number of treatment trials. For example, in a multi-centre randomised controlled trial, MBCT reduced the relapse rate of recurrent depression compared to treatment as usual from 66 per cent to 37 per cent in patients with a history of three or more episodes (Teasdale et al., 2000). A later replication study by Ma and Teasdale (2004) yielded similar results. Further, the National Institute for Clinical Excellence Guidelines (2004) for Depression recommend MBCT for recovered depressed patients as it may ‘significantly reduce the likelihood of future relapse’ (p76).

While understanding of how mindfulness programs like MBSR and MBCT may bring about reductions in psychological distress in affective disorders is in its infancy, a number of psychological mechanisms of change have been put forward. Briefly, it has been proposed that mindfulness practice may: promote cognitive change (Teasdale, 1999); strengthen relaxation responses to stress (Borkovec & Sharpless, 2004); lead to more adaptive meta-cognitive processing (Wells, 2002) reduce the dominance of rigid verbal based rules that govern behaviour (Hayes, 2002); increase self-efficacy and adaptive coping (Craske & Hazlett-Stevens, 2002); reduce experiential avoidance and deepen emotional processing (Roemer & Orsillo, 2002); improve emotion regulation, emotion awareness, and emotion understanding (Mennin, Heimberg, Turk, & Fresco, 2002). In

addition, it has been suggested by Dimidjian and Linehan that mindfulness practice may lead to greater insight, compassion, wisdom, and self-determination. Baer (2003) has thus concluded that MBCT can be considered a quite broad multi-component intervention, but differs from traditional cognitive therapy approaches in so far that it is not goal oriented in terms of changing negative affect or the content of thoughts. A number of the above hypothesised mechanisms of change are thought to be at least partly underpinned by an increase in daily mindful awareness. For example, Teasdale et al. (1995) suggest that mindfulness training may promote recognition of and response to early signs of a problem. It would therefore be expected that Mindfulness training would increase mindful awareness and that level of mindful awareness would be related to symptom severity.

In summary, MBSR appears to be effective in reducing distress associated with various medical and psychological conditions and MBCT has demonstrated efficacy in the prevention of relapse in recurrent depression. To date, however, there exist no published studies evaluating MBCT in heterogeneous groups of psychiatric patients. There are at least two motivations for such an investigation. Firstly, there is a published session by session program manual for the MBCT program (but not for the MBSR program) which increases the potential for dissemination of this approach. Secondly, it is unknown if the inclusion of cognitive therapy elements in addition to mindfulness meditation skills may enhance treatment gains over MBSR for patients with psychiatric diagnoses.

The present study sought to evaluate the effectiveness of MBCT (using the comprehensive treatment manual Segal et al., 2002a) in a heterogeneous group of adult outpatients with psychiatric presentations. In addition to employing MBCT with an as-yet unstudied sample, the current research aimed to investigate the effectiveness of MBCT in actual clinical practice. It is often argued that patients in non-research clinical settings differ from research samples and that results of clinical trials are not easily generalized to

purely applied settings, with controlled clinical trials not capturing “the full richness and variability of actual clinical practice” (p.14 Chambless & Hollon, 1998). The present study is an effectiveness study and not an efficacy study. Efficacy studies examine the effects of treatment in randomized controlled trials, involving recruited patients, using a highly structured treatment manual for a narrow problem focus. Effectiveness studies examine the effects of treatment conducted in non-research based clinical settings. The aim of such research is to maximize the external validity or generalization of results to various settings.

A subsidiary aim of the current study was to investigate the impact of MBCT on a measure of daily mindful awareness: The Mindful Attention Awareness Scale (Brown & Ryan, 2003). It was predicted firstly that MBCT would lead to a significant increase in mindful awareness from pre to post treatment, and that level of mindful awareness achieved would be negatively associated with level of depression, anxiety, and stress.

## Method

### *Participants*

Twenty six participants commenced the MBCT program. Of these, 20 (77%) were female, and the average age was 39.5 ( $SD = 15.27$ ; range = 18-73). All participants were Caucasian. With respect to marital status, 9 (34.60%) were married or in a defacto relationship, 12 (46.2%) were single, and the remaining 5 (19.2%) were either widowed, divorced, or separated. With respect to educational level, 25 (96.4%) participants had completed high school, and 17 (65.4%) had also completed a college degree or diploma. The type and frequency of diagnosis across participants at pre treatment was as follows: depression ( $n = 11$ ), dysthymia ( $n = 5$ ), generalized anxiety disorder ( $n = 11$ ), social phobia ( $n = 3$ ), panic disorder ( $n = 1$ ), health anxiety ( $n = 1$ ), somatisation disorder ( $n = 1$ ), substance abuse ( $n = 1$ ), and eating disorder ( $n = 4$ ). At pre-treatment, the mean self-reported duration of psychological difficulty was 10.12 years ( $SD = 7.48$ ). Two participants

did not meet diagnostic criteria for a psychological disorder. The mean number of past depressive episodes was 2.4 ( $SD = 1.55$ ).

#### *Primary Outcome Measures*

*Beck Depression Inventory* (BDI: Beck, Rush, Shaw, & Emery, 1979). The BDI was administered as an index of the severity of depression. The 21-item BDI was developed to assess the severity of depressive symptoms. For each item, respondents are asked to indicate which of 4 statements numbered 0-3 describe how they have been feeling in the previous week. Higher scores indicate greater severity. Research has supported its psychometric properties, including its test retest reliability and internal consistency (Beck, Steer, Ball, & Ranieri, 1996).

*Depression Anxiety and Stress Scales* (DASS: Lovibond & Lovibond, 1995). The DASS is a 42 item self report questionnaire assessing symptoms of depression, anxiety, and stress. Items are rated on a 4-point scale (did not apply to me at all – applied to me very much, or most of the time). The DASS is a widely used measure with adequate internal consistency for the three scales ( $\alpha = .80-.91$ ) and a reliable factor structure (Lovibond & Lovibond, 1995). Norms exist for the DASS (Lovibond & Lovibond, 1995) which will facilitate evaluation of clinical significance of the treatment.

#### *Process Measure*

*The Mindful Attention Awareness Scale* (MAAS: Brown & Ryan, 2003). The MAAS is a 15-item measure of the general tendency to be aware of present-moment experience in daily life and will assess if participants are employing mindfulness skills in their daily lives. It has good convergent and discriminant validity and high internal consistency ( $\alpha = .82$ ; Brown & Ryan, 2003).

#### *Other Psychological Measures*

*Insomnia Severity Index (ISI)* (Bastien, Vallieres, & Morin, 2001). The ISI is a seven item measure that assesses severity of sleep problems, the impact that poor sleep has on daytime functioning, and degree of distress associated with poor sleep. Scores range from 0 to 28, and scores of eight and above are taken to indicate significant difficulty with sleep (with scores between 8 and 14 indicating subthreshold insomnia, and scores above 15 indicating clinical insomnia (Bastien et al., 2001).

*Rosenberg Self Esteem Scale (SES)* (Rosenberg, 1965). This is a ten item self-report measure and is one of the most widely-used self-esteem measure in social science research. It consists of 10 statements related to overall feelings of self-worth or self-acceptance. The items are answered on a four-point scale ranging from strongly agree to strongly disagree (minimum score is 10, maximum is 40). The Rosenberg Self-Esteem Scale has demonstrated good reliability and validity across a large number of different sample groups.

*The Credibility/Expectancy Questionnaire* (Deville & Borkovec, 2000) is a 6 item questionnaire that assesses participants' views about how logical the treatment appears, expectations of success, and willingness to recommend the treatment to others. This questionnaire has demonstrated high internal consistency (standardized alpha = 0.84-0.85) and good test-retest reliability over one week (0.83). This questionnaire was administered at the end of session 2.

### *Procedure*

*Participant Selection and Assessment:* Potential participants were recruited through letters inviting referrals from psychiatrists and clinical psychologists, and a local newspaper article. Inclusion criteria were (1) age over 18; (2) the participant presented with psychological symptoms of depression, anxiety, or stress; (3) able to attend an assessment interview and 8 weekly mindfulness classes; (4) able to pay the \$400 course fee (for which

some participants were able to claim a private health fund rebate). Exclusion criteria were (1) currently psychotic; (2) evidence of intellectual impairment; (3) English not being used as the primary language at home; (4) currently at risk of suicide and not having support from a case manager. Participants were excluded and included according to the above criteria across the assessment procedure which comprised (1) a telephone screening interview; (2) a psychological assessment that consisted of completion of a questionnaire battery, and administration of the Structured Clinical Interview for DSM-IV (SCID) part I. At the assessment interview, potential participants were invited to take part in the program, were orientated to the nature of the program, and gave their informed consent if willing to participate. The longest waiting time from pre treatment assessment to commencement of treatment was three weeks.

Fifty two potential participants were screened over the telephone. Eight enquirers did not meet the criteria of having current anxiety, depression, or stress symptoms, and eighteen respondents were excluded due lack of interest, or inability/unwillingness to participate. After two groups of eight and one group of ten participants had been filled, any further respondents were placed on a waiting list for a future group. All of the 26 potential participants who attended the assessment interview were offered a place in, and commenced the program.

*Questionnaire Administration.* Prior to the assessment interview, participants meeting inclusion criteria were sent a package containing information about the research and a battery of questionnaires (described above). The post-treatment assessment consisted of a questionnaire battery containing the same measures, in addition to a treatment satisfaction questionnaire, and a question asking participants to rate how important the program had been to them (0 = not at all important, 10 = extremely important). Participants were assessed individually, 1-10 days after the last group session. Finally, the follow-up

assessment involved participants completing questionnaires at the beginning of the final follow-up session

*Treatment setting, facilitators, and protocol.* Private Clinics Australia is centrally located in a city of 1.5 million people and offers private psychiatric services to adolescents, adults, and the elderly, referred with a wide range of diagnoses. The two therapists conducting the pre and post assessments were registered Clinical Psychologists. Of the two principle MBCT facilitators, one was a registered Clinical Psychologist and one was a Clinical Psychologist Registrar. Both had training and experience in MBCT. The two facilitators were present in each class, one taking the lead role, and one taking an observational role and looking after any administrative matters. The lead facilitator did not conduct the post assessments.

The treatment used in this study was the Mindfulness-Based Cognitive Therapy protocol detailed in Segal, et al (2002a). Each of the three programs ran for eight consecutive weeks, and involved weekly evening sessions of 2.5 hours duration. Patients attended classes and were encouraged to listen to Mindfulness Meditation CDs at home for 45 minutes six days out of seven. In order to enhance protocol compliance treatment manuals and participant handouts were prepared in accordance with that outlined in Segal, et al (2002a). Facilitators followed the weekly agenda set out in the manual and each participant was provided with the corresponding set of MBCT medication CDs. The main deviation from the published manual occurred in class 4 in which psychoeducation for anxiety and stress, in addition to depression was given. Throughout the program, examples to illustrate key points were related either to depression, anxiety, or both, rather than relating more narrowly to depression as in the MBCT manual. A follow-up group was also held three months after the last mindfulness session. The session was two hours in duration and consisted of live meditation practice, a review of the previous three months, and construction of a practice plan for the coming months.

### *Data Analysis*

Changes to each measure across time (pretreatment, posttreatment, 3 month followup) were assessed with paired sample *t*-tests. Treatment effect sizes were calculated using Cohen's *d* statistic (Cohen, 1988):  $d = M_{\text{initial}} - M_{\text{post}} / SD_{\text{pre}}$  (Shapiro et al, 1994). Pearson bivariate correlations were used to assess associations between the MAAS and primary outcome measures. For the clinical significance analysis, clinical cut-off scores were based on published normative data for each primary outcome measure. A score was deemed to be in the clinical range if it was greater than or equal to the cut-off score. For the BDI, DASS stress, depression, and anxiety scales cut-off scores were 11, 14, 10, and 7 respectively.

## Results

### *Participant Attendance and Enactment*

The mean number of sessions attended by the 26 participants was 7.23 ( $SD = 1.03$ ). Treatment completion was defined as attending at least 6 out of the 8 sessions, including the final session. On the basis of this, three participants were classified as treatment non-completers and these participants attended 4, 5, and 6 sessions. In order to enhance treatment enactment, participants were assigned weekly homework tasks and were encouraged to engage in daily mindfulness practice. At the three month follow-up session participants were asked to record the average number of days per week during the follow-up period that they practice formal meditation (listening to a meditation CD) and informal meditation (meditation in daily life). The mean number of days per week of formal meditation practice was 2.78 ( $SD = 2.19$ ) and of informal practice was 5.21 ( $SD = 2.52$ ).

### *Primary outcome measures*

*Whole sample analysis.* Table 1 presents the results from a completer analysis and an intent to treat analysis for the DASS and BDI scores at each assessment period. The completer analysis does not include data from the three non-completers. The intent to treat analysis replaces missing post-treatment scores with pre-treatment scores. Any missing data at follow-up was replaced with post-treatment scores. The intent to treat analysis therefore provides a measure of treatment effectiveness that includes those who did not complete treatment. For both completer and intent to treat analyses, all pre-post changes were statistically significant. All post-treatment to follow-up changes were non-significant. The only exception was the intent to treat analysis of the DASS anxiety scale whose score was significantly lower at the three month follow-up compared to post-treatment.

Pre-post treatment effect sizes are also displayed in Table 1. For both completer and intent to treat analyses, pre-post effect sizes were in the medium range, apart for DASS anxiety, which only had a small improvement. For both completer and intent to treat analyses, pre-follow-up effect sizes for the primary outcome measures were generally in the medium range, except for completer BDI depression, which showed a large effect.

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Insert Table 1 about here

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*Clinical significance analysis.* Due to the heterogeneous nature of the sample, the above analysis included patients who had pre-treatment scores in the non-clinical range on certain measures. As such, the analysis was likely to reflect an underestimation of the actual level of change achieved by individuals scoring in the clinical range. Therefore, the intent to treat analysis was re-run for each primary outcome measure selecting only those cases where the pre-treatment score was in the clinical range for the measure. The results are summarised in Table 2. As can be seen all pre-post and pre-follow-up improvements

were statistically significant. All post-follow-up changes were non-significant, suggesting that post-treatment improvements were maintained at three month follow-up. However, this time all pre-post and pre-follow-up effect sizes were large with the exception of pre to post-treatment improvement on the BDI and DASS anxiety, which were in the medium range.

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Insert Table 2 about here

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In order to provide an indication of improvement in terms of the frequency of participants that had achieved recovery status for each primary outcome measure, clinically significant improvement frequencies for each measure were calculated. Consistent with past treatment research (e.g., Borkovec & Costello, 1993), this analysis defined a response to treatment on respective outcome measures as a 20% or more improvement from pre-treatment levels. Clinically significant improvement (recovered status) was then defined as: 1) a pre treatment score in the clinical range; 2) a 20% response or more; and 3) a post treatment and/or follow-up score that was in the non-clinical range. Table 3 displays rates of response, clinically significant improvement at post-treatment and follow-up, as well as the mean score and mean level of improvement on each measure for those patients achieving a clinically significant improvement.

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Insert Table 3 about here

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#### *Other psychological measures*

Table 1 presents the results from a completer analysis and an intent to treat analysis for the ISI insomnia and RSES self-esteem scores at each assessment period. For both

completer and intent to treat analyses, all pre-post changes were statistically significant. There was no significant change on these scores from post-treatment to three month follow-up.

Pre-post treatment effect sizes are also displayed in Table 1. For both completer and intent to treat analyses, pre-post effect sizes were medium or large. For both completer and intent to treat analyses, pre-follow-up effect sizes for the ISI insomnia and RSES self-esteem were approaching the large range, except for completer RSES self-esteem which was in the small to medium range.

*Process Measure: Mindful Attention and Awareness Scale (MAAS)*

Table 1 displays mean scores for the MAAS at pre and post-treatment, as well as within group *t*-scores and effect sizes. The results indicate a statistically significant increase in MAAS scores from pre to post-treatment, although in the small effect size range.

In order to explore the relationship between MAAS scores and symptom scores, a Pearson bivariate correlation analysis was also conducted (see Table 4). Large and significant negative correlations were observed between daily mindfulness at post treatment and symptom level on the BDI and DASS at post-treatment. However, correlations between the MAAS and DASS anxiety and depression symptom scores were non-significant at follow-up, and there were no significant correlations between *change* in MAAS scores from pre to post treatment and symptom scores at both post-treatment and follow-up.

Given low power for the small sample, Cohen's (1988) effect size criteria for correlations (i.e.  $r > .3 =$  medium effect,  $r > .5 =$  large effect) was employed in order to further assess relationships. As Table 4 shows, the large correlations observed between MAAS scores and symptom measures at post-treatment reduced by follow-up to fall in the medium range. Change in MAAS scores from pre to post-treatment had a medium negative

correlation with post-treatment DASS anxiety scores, but attenuated by follow-up to be in the small range. All other correlations between change in MAAS scores and primary outcome measures were in the small effect size range at post treatment and follow-up.

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Insert Table 4 about here

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### *Treatment credibility and acceptability*

At the end of session 2, participants ( $n= 26$ ) completed the treatment credibility questionnaire. The results indicated that the logic ( $M = 7.77$ ,  $SD = 1.53$ ), utility ( $M = 6.56$ ,  $SD = 2.15$ ), confidence in recommending ( $M = 7.35$ ,  $SD = 1.60$ ) and prediction that treatment would help ( $M = 7.35$ ,  $SD = 2.04$ ) were all rated highly (range of possible scores 1- not at all, to 9 - very). In addition, participants also highly rated the percent improvement they thought would occur ( $M = 54.44\%$ ,  $SD = 25.39$ ) and felt would occur ( $M = 52.88\%$ ,  $SD = 26.54$ ). At post treatment participants ( $n= 23$ ) completed a treatment satisfaction questionnaire designed for use in this study (all items were rated on a 0-5 scale where 0 = strongly disagree and 5 = strongly agree). The results suggest that participants found the class facilitators approachable ( $M = 4.61$ ,  $SD = 0.89$ ) and knowledgeable ( $M = 4.54$ ,  $SD = 0.88$ ), meditation practice helpful ( $M = 4.04$ ,  $SD = 0.91$ ), and the course as a whole worthwhile ( $M = 4.58$ ,  $SD = 0.88$ ). Finally, the importance of the program was rated during session 8 on a scale from 0 (not at all important) to 10 (extremely important), and the mean importance rating was 8.18 ( $SD = 1.78$ ).

### Discussion

The results of this effectiveness study of MBCT in a heterogeneous group of adult psychiatric outpatients are encouraging. In general, the results suggest that MBCT is an acceptable and credible treatment that was associated with significant symptom

improvement. The setting of the Marian Center meets many of Shadish et al's (1997) criteria for the highest level of clinical relevance: the setting is a non-university clinic, therapists are professionals with regular caseloads, there is no monitoring of treatment other than routine supervision, patients are heterogeneous in age, sex, and diagnosis, and therapists were not given specific training for the purpose of this study.

#### *Primary outcome measures*

Statistically significant improvements on all measures were achieved from pre-post treatment and these gains were maintained at three month follow-up. Mean DASS scores for all scales at pre treatment were in the moderate range and in the normal range at follow-up. For those patients who had pre treatment scores in the clinical range, the mean DASS depression score moved from the severe range at pre treatment to the mild range at follow-up, the mean DASS anxiety score moved from the moderate to the mild range, and the mean DASS stress score moved from the moderate range at pre treatment to the mild range at follow-up.

Despite large variations in diagnosis and symptom patterns between participants, over 50% of participants who had a pre treatment score in the clinical range on a particular measure were classified as treatment responders by post treatment, and this rate of response rose to be over 60% at follow-up. Analysis of clinical significance at follow-up also suggests that for those participants who had a score in the clinical range on a particular outcome measure a pre-treatment, MBCT was associated with a clinically significant improvements for a about 50% of them by follow-up. While these results are encouraging, they need to be viewed in light of the 40 to 50% of patients who had a symptom score in the clinical range and who failed to achieve a clinically significant improvement by post-treatment or follow-up.

#### *Secondary outcome measures*

Statistically significant improvements on measures of insomnia severity and self-esteem were achieved from pre-post treatment and these gains were maintained at three month follow-up. Mean ISI scores at pre treatment were in the subthreshold insomnia range and in the normal range post treatment at follow-up, with a large pre-post and pre-follow-up effect size. On average, by follow-up individuals were experiencing marked improvements in the level of their sleep quality and more modest improvements in their level of self-esteem.

#### *Process measure*

The MAAS was administered at pre and post treatment in order to assess the extent to which MBCT brought about change in daily mindful awareness. Consistent with expectations, a significant, increase in MAAS scores at post treatment was observed, and post treatment MAAS scores (but not *change* in MAAS scores from pre to post treatment) were negatively associated with symptom scores at post treatment and follow-up. This is consistent with the notion that a certain absolute level of daily mindfulness (rather than a certain level of *change* in daily mindfulness) is associated with lower depression, anxiety, and stress levels. This preliminary finding is consistent with the hypothesis that higher daily mindfulness is associated with lower symptom severity. However, more formal analysis of this hypothesis awaits further investigation. The medium, although non-significant relationship observed between improvement in MAAS scores and lower DASS anxiety at post-treatment suggests low power may have resulted in a type II error. Clearly, studies with larger sample sizes are required before stronger conclusions can be made about the association between improved mindfulness and lower symptom severity.

While low power may have explained some of the previous non-significant findings for the MAAS, an alternative explanation is that improvement on self-reported mindful awareness may be difficult to achieve by a relatively short duration program like MBCT.

As has been suggested by previous research, larger and more meaningful improvements in mindful awareness may require extended periods of time and persistent levels of practice (e.g., Brown & Ryan, 2003). Further, it should be considered that a variety of psychological processes may be involved in maintaining different pathology symptoms, and that these processes may have varying relationships with mindful awareness. As Baer (2003) has argued, mindfulness programs may involve multiple change mechanisms (e.g., acceptance, emotion-regulation, exposure, and other cognitive and meta-cognitive changes). More research is clearly required to investigate the possible mechanisms underlying change in mindfulness interventions.

#### *Comparison of results with MBSR effectiveness studies*

For MBCT to be considered a viable treatment alternative to MBSR, it is important to establish its comparable effectiveness. The results of the current study were compared with other outcome studies of mindfulness based approaches. Grossman et al. (2004) conducted a meta-analysis of eighteen uncontrolled studies of the impact of Mindfulness-based interventions (mostly MBSR) on a heterogeneous sample of medical and psychiatric patients. A mean pre-post treatment effect size for mental health variables of 0.50 was revealed. Further, Reibel et al (2001) in an uncontrolled effectiveness study of MBSR in a heterogeneous group of 121 patients with medical and/or psychiatric diagnoses found pre-post treatment effect sizes of 0.47 for depression, 0.57 and for anxiety. The average pre-post treatment effect size for the primary outcome measure for completers of 0.56 obtained in the current study thus compares satisfactorily with past research and is consistent with the view that the findings of past research can be generalized to mental health outpatients with a variety of presentations.

#### *Comparison of results with CBT effectiveness studies*

For MBCT to be considered a viable treatment alternative to CBT, it is important to establish its comparable effectiveness. The current study results were compared to those of Westbrook and Kirk who conducted a completer analysis on outcome data from a large ( $n=776$ ) heterogeneous sample of adult outpatients receiving individual CBT. They reported a pre-post treatment effect size of 0.67 on the BDI, which was comparable to the pre-post effect size of 0.57 for the BDI in the current study. In terms of clinical significance, while differences in methodology between studies suggest caution when making comparisons, Westbrook and Kirk found that between 30-44% of patients with BDI scores in the clinical range at pre-treatment achieved clinically significant change at post treatment. This is comparable to the 33% of participants in the clinical range who achieved clinically significant change at post treatment in the current study (which increased to 44% at follow-up). It should also be noted that the Westbrook and Kirk results for clinical significance were based on a completer analysis rather than intent to treat analysis and so represent less conservative estimates of clinical significance than those reported in the current study.

#### *Study limitations*

The limitations of the current study are also the features that define it as effectiveness research. As already highlighted, there was no control group and the sample size was small. The results should therefore be interpreted with caution and require controlled replication. The data for this study were collected as part of routine clinical practice and as such, the assertive follow-up of missing data that is characteristic of research trials was not present. Finally, there were no treatment integrity checks. Sessions were not video or audio taped and the exact level of adherence to the MBCT manual can therefore not be evaluated.

Another limitation is the exclusive reliance on self-reports for symptom and process measures, which may have been contaminated by socially desirable responding and inaccurate reporting. Furthermore, due to the heterogeneity of the sample, for some patients the questionnaires may have been irrelevant to their disorder, and in the case of the MAAS, participants may lack insight into their actual level of mindful awareness. Multi-modal assessment procedures and more sensitive instruments may be required by future research to increase the power of detecting changes in mindful responding that may not be readily detectable by some self-reports.

### *Conclusions*

In summary, the preliminary results presented in this paper suggest that MBCT: (a) is acceptable to patients; (b) is associated with improved symptoms of stress, depression, and anxiety; (c) produces symptom improvement of a magnitude at least in line with both CBT and MBSR in routine clinical practice; (d) is related to improved self-reported sleep quality and self-esteem; (e) is associated with increases in daily mindfulness which was associated with fewer symptoms at follow-up. As such, despite MBCT being designed for prevention of depressive relapse, the results show that it is treatment approach that may have broader application. These present findings clearly suggest that MBCT is a promising intervention that may provide benefits beyond just depression relapse prevention. Further controlled or treatment comparison studies are warranted in larger samples to more fully assess its potential benefits as cost-effective intervention in outpatient populations with mood and anxiety disorders. Research should also include other process measures in an endeavor to investigate the variety of potential mechanisms of change that MBCT may involve when applied to heterogeneous outpatient populations.



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Table 1.

Mean Scores and Effect Sizes (Cohen's  $d$ ) for Primary, Secondary and Process Measures at Each Assessment Period for Patients Completing to Post-treatment and for Intent to Treat Patients.

	Pre-Treatment		Post-Treatment		Follow-up			Post-Follow-up	
	Mean (SD)	Mean (SD)	$t_{\text{pre-post}}$	$d_{\text{pre-post}}$	Mean (SD)	$t_{\text{pre-fu}}$	$d_{\text{pre-fu}}$	$t$	$d$
<b>Completer analysis</b>		( $n = 23$ )					( $n = 21$ )		
<i>Primary outcome measures</i>									
Beck Depression Inventory	16.18 (10.06)	10.41 (8.87)	3.90**	0.57	8.61 (6.77)	5.62**	0.89	1.48	0.21
DASS stress	18.21 (10.34)	11.80 (9.18)	4.21**	0.62	11.37 (10.02)	3.19**	0.75	0.24	0.05
DASS anxiety	10.78 (7.99)	7.56 (7.04)	2.36*	0.40	5.30 (5.70)	3.16**	0.76	1.81	0.31
DASS depression	15.06 (10.55)	8.30 (9.13)	3.37**	0.64	7.90 (5.72)	3.20**	0.71	0.64	0.11
<i>Other psychological measures</i>									
Insomnia Severity Index	10.22 (5.83)	5.34 (4.40)	4.66**	0.84	5.44 (4.66)	3.32**	0.75	0.47	0.02
Rosenberg Self Esteem Scale	23.98 (6.09)	28.13 (9.82)	2.26*	0.68	26.30 (1.89)	2.31*	0.47	0.88	0.18
<i>Process measure</i>									
MAAS mindfulness	49.14 (17.07)	54.57 (17.22)	2.38*	0.32			Not administered		
<b>Intent to treat analysis</b>					( $n = 26$ )				
<i>Primary outcome measures</i>									
Beck Depression Inventory	17.65 (11.12)	12.46 (11.19)	3.98**	0.47	10.69 (10.54)	4.95**	0.63	1.81	0.16
DASS stress	19.31(10.29)	13.63 (10.16)	4.04**	0.55	12.56 (10.12)	3.64**	0.66	0.64	0.11
DASS anxiety	11.08 (7.71)	8.23 (7.04)	2.33*	0.37	6.46 (6.93)	3.05**	0.60	2.10*	0.25
DASS depression	16.60 (11.56)	10.61(11.53)	3.28**	0.52	9.46 (10.78)	3.65**	0.62	0.89	0.10
<i>Other psychological measures</i>									
Insomnia Severity Index	10.67 (5.77)	6.18 (5.09)	4.48**	0.78	6.14 (5.09)	4.00**	0.79	0.20	0.04
Rosenberg Self Esteem Scale	23.62 (6.00)	27.44 (9.73)	2.25**	0.64	28.36 (6.52)	5.22**	0.79	0.60	0.06
<i>Process measure</i>									
MAAS mindfulness	48.12 (16.67)	53.10 (17.19)	2.38*	0.30			Not administered		

**Notes:** t-tests were two tailed. \*  $p < .05$ , \*\*  $p < .01$ . According to Cohen (1988)  $d = .5$  medium effect,  $d = .8$  large effect. DASS = Depression Anxiety Stress Scales, MAAS = Mindful Attention Awareness Scale

Table 2

Intent to Treat Means (standard deviation), Improvement (paired sample *t*-test), and Effect Sizes (Cohen's *d*) from Pre-treatment to Post-treatment and Follow-up on each Primary Outcome Measure for those Cases with a Pre-test Score in the Clinical Range.

Measure	Pre	Post			Follow-up			Post to Follow-up	
	Mean (SD)	Mean (SD)	<i>t</i> <sub>pre-post</sub>	<i>d</i>	Mean (SD)	<i>t</i> <sub>pre-post</sub>	<i>d</i>	<i>t</i>	<i>d</i>
BDI depression ( <i>n</i> = 18)	22.78 (9.35)	16.22 (11.44)	3.70**	0.71	13.56 (11.25)	5.33***	0.98	1.97	0.23
DASS stress ( <i>n</i> = 18)	24.44 (7.73)	17.03 (10.46)	3.97**	0.96	15.42 (10.52)	3.73**	1.17	.69	0.16
DASS depression ( <i>n</i> = 17)	22.85 (9.23)	15.06 (12.07)	2.91*	0.83	12.82 (11.70)	3.76**	1.08	1.22	0.18
DASS anxiety ( <i>n</i> = 18)	14.89 (5.95)	10.56 (7.17)	2.65*	0.72	8.31 (7.49)	3.26**	1.11	1.94	0.31

**Notes:** *t*-tests were two tailed. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . According to Cohen (1988)  $d = .5$  medium effect,  $d = .8$  large effect. Cases selected for analysis conducted on each measure where those that had scores at pre-test in the clinical range on the particular measure in question. Cut-offs were based on published measure properties in non-clinical community samples. Scores deemed to be in the clinical range were scores greater than or equal to 11, 14, 10, and 7 for BDI, DASS stress, depression, and anxiety scales respectively.

Table 3

Intent to Treat Treatment Response, Clinically Significant Improvement (CSI), Means, and Mean Improvement for those Patients Achieving a CSI at Post-treatment and 3-month Follow-up for each Primary Outcome Measure with Pre-treatment Scores in the Clinical Range.

Measure	Post-treatment				Follow-up			
	Response Rate	CSI Rate	CSI Mean	CSI Mean Improvement	Response Rate	CSI Rate	CSI Mean	CSI Mean Improvement
BDI depression ( <i>n</i> = 18)	55.6% (10)	33.3% (6)	4.83 (3.60)	11.67 (5.96)	77.8% (14)	44.4% (8)	4.75 (3.65)	12.87 (6.08)
DASS stress ( <i>n</i> = 18)	55.6% (10)	44.4% (8)	6.75 (3.33)	13.00 (6.99)	66.7% (12)	61.1% (11)	8.77 (4.61)	14.14 (8.25)
DASS depression ( <i>n</i> = 17)	58.8% (10)	41.2% (7)	3.71 (2.98)	16.07 (9.99)	64.7% (11)	47.1% (8)	3.62 (2.45)	17.44 (7.89)
DASS anxiety ( <i>n</i> = 18)	55.6% (10)	27.8% (5)	3.60 (1.67)	8.80 (4.97)	66.7% (12)	55.6% (10)	3.85 (2.11)	11.75 (5.04)

**Notes:** Frequencies and standard deviations in parentheses. For each measure, individuals were included in analysis if their pre-test score was in the clinical range. Response was a 20% or more improvement in score. CSI (recovered status) was defined where the pre-test score was in the clinical range, improved by at least 20% (response) and was in the non-clinical range (below the cut-off) at post treatment and follow-up. CSI mean is the mean for those individuals achieving a CSI on the respective measure. CSI mean improvement is the mean level of improvement for those individuals that had a CSI.

Table 4.  
Pearson Bivariate Correlations Between Primary Outcome Measures at Post-Treatment and Follow-up and the Process Measure

Measure	BDI post	DASS stress post	DASS anxiety post	DASS depression post	BDI follow up	DASS stress follow up	DASS anxiety follow up	DASS depression follow up
	(n = 24)				(n = 20)			
MAAS post	-.73***#	-.67***#	-.71***#	-.65***#	-.52*#	-.46*#	-.42#	-.40#
MAAS change pre-post	-.19	-.29	-.32#	-.19	.10	-.18	-.27	-.07

**Notes:** \*  $p < .05$ , \*\*  $p < .01$  (2-tailed). # medium effect size or greater ( $r \geq .3$ ). BDI = Beck Depression Inventory, DASS = Depression Anxiety Stress Scales, MAAS = Mindful Attention Awareness Scale