



Mindfulness-based cognitive therapy for residual depressive symptoms

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Objectives. Mindfulness-based cognitive therapy (MBCT) is a new group-based intervention for prevention of relapse in recurrent depression which has not been scientifically evaluated regarding its clinical effectiveness for ameliorating residual depressive symptoms following a depressive episode. The aim of this study was to assess the efficacy of MBCT in reducing residual depressive symptoms in psychiatric outpatients with recurrent depression, and to particularly explore the effects of mindfulness techniques on rumination.

Design. The design of this study was a mixed model complex design. Design 1 consisted of a consecutive series of patients. They were assigned to either MBCT or TAU. The independent variables were time and group allocation, and dependent variables were Beck Depression Inventory (BDI) and Rumination Scale. In Design 2, the TAU group proceeded to complete an MBCT group, and the BDI and Rumination Scale results of the two groups were collapsed.

Method. Nineteen patients with residual depressive symptoms following a depressive episode, and who were attending outpatient clinic, were assigned to either MBCT or treatment as usual (TAU), with the TAU group then proceeding to complete an MBCT group. Depressive and ruminative symptoms were assessed before, during, and after treatment, and at one-month follow-up.

Results. A significant reduction in depressive symptoms was found at the end of MBCT, with a further reduction at one-month follow-up. A trend towards a reduction in rumination scores was also observed.

Conclusions. Group MBCT has a marked effect on residual depressive symptoms, which may be mediated through the mindfulness-based cognitive approach towards

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excessive negative ruminations in patients with residual depressive symptoms following a depressive episode.

Whilst the treatment of the acute depressive episode in recurrent major depressive disorder by pharmacological and psychotherapeutic means is well developed, the treatment of the residual depressive symptoms that are common following the resolution of the acute episode has received less attention.

Depression is commonly a relapsing clinical condition, with up to 80% of individuals experiencing a single episode of depression going on to suffer multiple episodes during their lifetime (Kupfer *et al.*, 1992). Moreover, it is now recognized that for many patients, discrete episodes of illness with full recovery in between is not the norm. Paykel *et al.* (1995) found that 32% of patients had residual symptoms 12–15 months after the resolution of the acute episode. They also noted that these individuals were at much higher risk of relapse than those without (76 vs. 25%). Judd *et al.* (1998) found that the long-term course of recurrent major depression is characterized by prolonged symptomatic chronicity, with 59% of patients being symptomatically unwell at any point in time over 12-year follow-up. Whilst residual symptoms can respond to pharmacological interventions or ECT, many patients prefer psychotherapeutic options. Paykel *et al.* (1999) carried out a randomized controlled trial of the effects of individual cognitive therapy on relapse and residual symptoms in patients with recurrent major depression whose symptoms were partially remitted. They found that whilst there was an effect on relapse rates, symptoms ratings were not significantly improved.

The aim of this study was to assess the effectiveness of mindfulness-based cognitive therapy (MBCT) as a treatment for residual depressive symptoms. MBCT was developed by Williams, Segal, and Teasdale (Segal, Williams, & Teasdale, 2002) as a group intervention to be delivered over 8 weeks to the recovered depressed individual to reduce rates of recurrence. The MBCT programme trains participants in mindfulness skills, based on meditation techniques, combined with techniques from cognitive therapy. It was developed as a response to research on key cognitive vulnerability factors in recurrent depression.

A large randomized controlled trial (Teasdale *et al.*, 2000) looked at the efficacy of the MBCT programme and showed that people who had experienced three or more episodes of depression and participated in an MBCT group had significantly reduced rates of relapse at 1-year follow-up compared to controls (37 vs. 66%). A similar pattern of results (36 vs. 78%) was found by Ma and Teasdale (2004). However, these studies were carried out in the primary care setting with patients who were euthymic (inclusion criteria in Teasdale *et al.* (2000) was baseline Hamilton rating scale for depression of <10).

The purpose of our study was to look at the efficacy of MBCT in a psychiatric outpatient population with a history of recurrent major depressive disorder who had residual depressive symptoms (average BDI at outset = 30) as is typical of those who continue to attend psychiatric services for recurrent depression rather than return to the primary care setting. Our study also aimed to examine the treatment developers' hypothesis (Segal *et al.*, 2002) that the effect of mindfulness in depression is mediated by a reduction in levels of rumination, which has been shown to be an important cognitive vulnerability factor in recurrent depression (Nolen-Hoeksema, 1991).

Method

Design

The hypothesis was that the MBCT programme would improve depressive symptoms by the end of the programme, and at 1-month follow-up, as compared to treatment as usual (TAU). A second hypothesis was that levels of rumination would show a similar decrease. TAU typically consisted of regular outpatient visits to the catchment area psychiatric clinic, and pharmacotherapy. Patients who were assigned to the TAU condition went on to participate in a second MBCT group after the first group was completed, and therefore also functioned as a delayed wait list control. Patients were assigned to the treatment conditions on the basis of consecutive referral, with the first patients referred assigned to the MBCT group. It had been hoped to randomly assign patients; however, insufficient numbers had been referred by the time it was necessary to start the study.

Participants

The participants were aged between 20 and 62 years (average age, 41.8) with a diagnosis of recurrent major depressive disorder (≥ 3 previous episodes), residual depressive symptoms, and current Beck Depression Inventory (BDI) score of between 13 and 45. The reason for including only those with three or more previous episodes of depression is that research carried out to date on MBCT (Ma & Teasdale, 2004; Teasdale *et al.*, 2000) has shown that the treatment is not effective in those who have had fewer episodes of depression. The MBCT group comprised eight participants, and the TAU group 11 participants. Diagnoses were based on DSM-IV criteria-based consultant psychiatrist diagnosis and chart review using the same criteria. Two patients were included who had a diagnosis of bipolar affective disorder II, but who still met all the inclusion criteria listed above. Nine of the patients had a past history of deliberate self-harm. Exclusion criteria were current diagnosis of alcohol or other substance dependence, schizophrenia and bipolar affective disorder. All patients except for two (medication-free due to intolerable side-effects) were on adequate therapeutic doses of antidepressants, with four patients on antipsychotic medication and two on mood stabilizers. Nine patients were taking benzodiazepines.

MBCT programme

The MBCT programme consisted of eight weekly 2-hour sessions. A preliminary session was held 1 week prior to the start of the course in order to establish contact with the patients, and a follow-up session was held 1 month after the intervention. The programme was carried out by two therapists (TK and EL). The programme adhered to the session structure as described in the MBCT manual (Segal *et al.*, 2002). The initial sessions teach participants to shift from 'doing' mode to 'being' mode, which is achieved by training them to develop mindfulness via formal mindfulness meditation practice, body scanning techniques and mindful movement training. As the programme moves through the later stages, the practice instructions are repeated, and the focus moves to identifying how negative thoughts and emotions often trigger maladaptive efforts to escape these experiences, and to encouraging participants to try 'being' with those difficulties, and using this space to choose a more adaptive coping strategy. Participants are instructed to carry out homework exercises between sessions based on the skills acquired in each session.

Measures

The outcome measure used was the Beck Depression Inventory, a 21-item self-report questionnaire, each item being scored on a Likert scale. Items include ratings of biological, cognitive and emotional symptoms. Extensive validity and reliability data are available on this measure. It has a Cronbach's α of .92, indicating high reliability, and its validity has been shown in comparison with the Hamilton psychiatric rating scale for depression ($r = .72$), the Beck hopelessness scale and the scale for suicidal ideation (Beck, Brown, & Steer, 1998).

Rumination was measured using the rumination scale (Nolen-Hoeksema). This 22-item self-report measure was originally the rumination subscale of the responses to depression questionnaire (which also includes subscales for distraction, problem-solving and dangerous activities). The items are scored on a Likert scale. Cronbach's α for this scale is .89 and it has been shown to correlate significantly with diary measures of rumination (Nolen-Hoeksema & Morrow, 1991).

Statistical analysis

The statistical design was a mixed model complex design. Design 1 aimed to test the integrity of the programme in this group; that is, whether the treatment group improved following the programme, with controls remaining the same, or not. There were two independent variables, the first being treatment condition (MBCT vs. TAU) and the second being time (pre- and post-programme). The dependent variables were Beck Depression Inventory (BDI) and rumination scale (RUM). A 2×2 repeated ANOVA (analysis of variance) was used to test this design. Design 2 tested the efficacy of MBCT for both the MBCT group (group 1) and the TAU group (who went on to participate in a second MBCT group, group 2). Here, the first independent variable was group assignment (group 1 vs. group 2), and the second was time of testing (pre-, mid-point, post-, and 1-month follow-up). The dependent variables were the same as in design 1. The analysis here was a 2×4 repeated ANOVA.

Results

Twenty-eight participants attended an introductory session. Of these, 23 went on to attend one or more MBCT session, and 22 participants attended five or more sessions, and were deemed to have completed the programme. Data were collected on 19 of these subjects, eight from the MBCT group and 11 from the TAU group. The groups' age and gender breakdown were similar (Table 1). One person refused consent for use of their data and two more did not complete any measures, despite having given consent for their data to be used.

Table 1. Group age and gender breakdown

Group	MBCT	TAU
Number of participants	9	13
Number of participants contributing data	8	11
Gender of participants contributing data		
Male	1	1
Female	7	10
Mean age of participants contributing data	41.5	42.0

Reliabilities

Reliabilities of the rumination scale had a Cronbach's α of .82, and as such may be taken to be reliable in this population. The reliability of the BDI was not checked, as it is assumed to be reliable on the basis of extensive study carried out on this measure.

T-tests

Independent *t*-test analysis was used to check that the MBCT group and the TAU group did not differ in their means on the different scales before the MBCT intervention was carried out. Groups were not found to differ on the BDI $t(17) = 0.48$; $p > .05$ nor rumination $t(17) = 1.5$; $p > .05$. Homogeneity of variance was observed.

Design I

This consisted of a 2×2 repeated ANOVA, where the independent variables were group assignment (MBCT vs. TAU) and time of testing (pre- and post-MBCT intervention). The dependent variables were BDI and RUM.

BDI

The first variable under study was BDI. Descriptive statistics for BDI are shown in Table 2. A significant interaction was observed between group assignment and time of testing for BDI $F(1, 15) = 5.83$; $p < .05$ (Figure 1).

Table 2. Descriptive statistics for BDI and RUM at baseline and at 8 weeks and ANOVA

	Pre-		Post-		ANOVA		
	MBCT (N = 6)	TAU (N = 11)	MBCT (N = 6)	TAU (N = 11)	Time	Group	Interaction
BDI							
M	30.33	29.18	12.33	22.09	$F(1,15) = 30.84$	$F(1,15) = 1.19$	$F(1,15) = 5.83^*$
SD	7.66	9.35	9.72	8.99			
RUM							
M	60.33	63.33	49.33	59.00	$F(1,13) = 21.83$	$F(1,13) = 2.27$	$F(1,15) = 4.13$
SD	3.98	8.89	7.26	10.79			

* $p < 0.05$.

Given that a significant interaction (higher-order effect) was observed, the main effects for time and group (lower-order effects) are not reported. To ascertain the source of the interaction, tests of simple effects were carried out, and the following emerged: Test 1 looked at the difference in BDI scores between the MBCT and TAU groups before the intervention was carried out. Prior to the intervention, no significant difference was observed between MBCT and TAU groups on the BDI $F(1, 15) = 0.27$; $p > .05$. The outcome is in line with the *t* test which established group equivalence prior to treatment. Test 2 looked at the difference in BDI scores between the MBCT and TAU groups when the intervention was completed (i.e. at 8 weeks). At the end of treatment, the MBCT group showed a significantly decreased BDI score as compared to the TAU group $F(1, 15) = 9.26$; $p < .05$. Test 3 looked at the difference in BDI scores in the

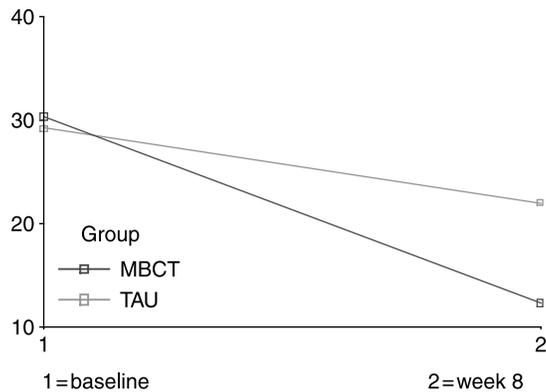


Figure 1. Changes in BDI for MBCT and TAU groups from baseline to end of treatment.

MBCT group over time, i.e. before starting treatment compared to after completing treatment. Between pre- and post-treatment for the MBCT group, a significant reduction of BDI score was observed, showing the benefit of participating in the MBCT group $F(1, 15) = 24.53; p < .05$. Test 4 looked at the difference in BDI scores in the TAU group over time, i.e. before and after treatment of the MBCT group. A small reduction in BDI scores also occurred in this group $F(1, 15) = 6.976; p < .05$. Cohen's d value showing effect size independent of statistical significance was 1.07, representing a large effect size.

Rumination

The second variable under study was rumination. There was no significant interaction observed between group assignment and time of testing $F(1, 13) = 4.13; p > .05$; however, the interaction approached significance, with a p value of .063 (Figure 2).

Given the absence of a significant higher-order interaction, lower-order effects of time and group are reported. A significant difference was observed on RUM pre- and post-testing overall $F(1, 13) = 21.83; p < .05$. Overall, the MBCT and TAU groups were not found to differ $F(1, 13) = 2.27; p > .05$). Despite the fact that the F values for RUM were not found to be significant, Cohen's d was calculated comparing the MBCT and

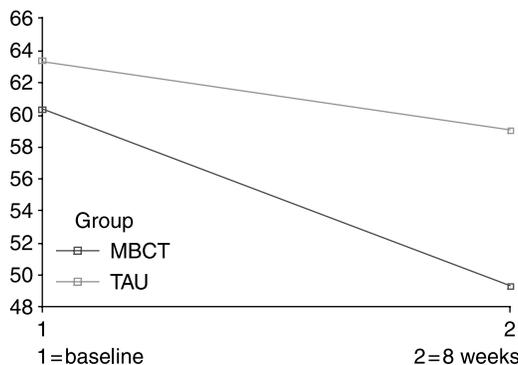


Figure 2. Changes in rumination for MBCT and TAU groups from baseline to end of treatment.

TAU groups. This value has the advantage of being independent of sample size, as group sizes in this study were small. It was calculated as $d = 1.16$, representing an effect size similar to that observed in BDI changes. Reductions in BDI scores were correlated with reductions in rumination scores $r(15) = .567$, $p < .05$. Given this significant association, the analysis looking at changes in rumination over time was re-run as ANCOVA using changes in BDI as the covariate. The ANCOVA analysis did not differ from the findings of the ANOVA.

Design 2

Here, the group who had acted as controls in design 1 were offered treatment, and both groups were assessed pre- and post-intervention, with additional assessments at the mid-point of the groups and at 1-month follow-up, leading to a 2×4 design. The independent variables were group assignment and time and the dependent variables were BDI and RUM (Table 3).

BDI

The first variable under study was the BDI. No significant interaction between group assignment and time of testing was observed $F(3, 30) = 0.67$; $p > .05$. Given that there was no significant interaction between the groups, change in BDI over time for both groups can be examined. This measure showed a significant change over time for both groups $F(3, 30) = 4.25$; $p < .05$. This change was noted to be linear, where BDI scores decreased from pre- to follow-up $F(1, 10) = 12.92$; $p < .05$ (Figure 3). Overall, groups 1 and 2 were not found to differ $F(1, 10) = 0.41$; $p > .05$.

Rumination

The next variable under study was RUM. No significant interaction between group and assignment and time of testing was observed $F(3, 24) = 1.51$; $p > .05$. Given that there was no significant interaction between the groups, change in RUM over time for both groups may be examined, and it was observed that change over time was approaching significance $F(3, 24) = 2.91$; $p = .055$. This change was observed to be a linear decrease in RUM scores $F(1, 8) = 5.36$; $p < .05$. Overall the groups did not differ $F(1, 8) = 0.14$; $p > .05$.

Independent t tests showed that there was group equivalence prior to starting the intervention. In both phases of the study, it was shown that MBCT benefitted the participants. In design 1 there was a significant change over time in BDI in the MBCT group compared to the TAU group, whilst the change in RUM approached significance. When the MBCT phases of both groups were studied together in design 2, with follow-up at 1 month added, these positive changes were upheld. Again, reductions in RUM in this design approached significance.

Discussion

Depression

Our findings support the hypothesis that residual depressive symptoms are decreased during an MBCT programme, and that clinical gains are maintained at follow-up. As residual symptoms are a risk factor for relapse, MBCT may be shown to reduce

Table 3. Descriptive statistics for BDI and RUM for both groups combined at pre-group, mid-group, post-group, and 1-month follow-up and ANOVA

	ANOVA						
	Pre-	Mid-	Post-	Follow-up	Time	Group	Interaction
BDI (N = 12)							
M	26.17	18.00	15.50	13.83	$F(3,30) = 4.25^*$ linear $F(1,10) = 12.92$	$F(1,10) = 0.41$	$F(3,30) = 0.67$
SD	8.99	7.62	10.56	11.76			
RUM (N = 10)							
M	56.70	52.80	51.30	48.60	$F(3,24) = 2.91$ linear $F(1,8) = 5.36^*$	$F(1,8) = 0.14$	$F(3,24) = 1.51$
SD	11.79	10.98	11.22	13.02			

* $p < 0.05$.

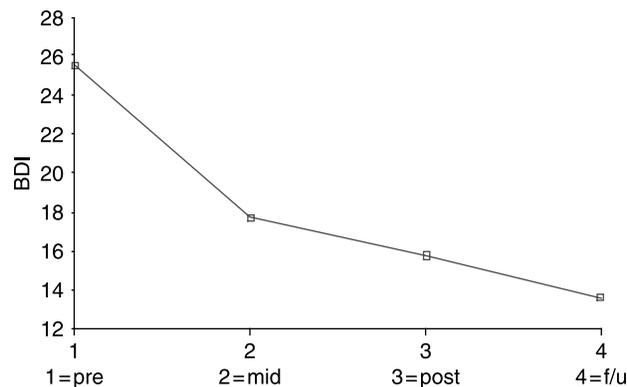


Figure 3. Effect of MBCT on BDI for both groups from baseline to 1-month follow-up.

relapse rates in larger future studies designed to test this hypothesis. The linear downward trend in residual depressive symptoms continued at 1-month follow-up, and it was noted from feedback at the follow-up session that the majority of participants were using a selection of the skills they had learned during the programme.

Why might mindfulness work in the relief of residual depressive symptoms? Nolen-Hoeksema (1991) highlighted the importance of rumination in vulnerability to depression, and Watkins and Teasdale (2001) showed that a ruminative style persisted even when the recurrently depressed individual was euthymic. Borkovec, Roemer, and Kinyon (1995) hypothesized that rumination serves the purpose of avoidance of emotional and behavioural meaning, and Baer (2003) explained that mindfulness provides exposure to emotions and thoughts, providing desensitization to conditioned responses and reducing avoidance behaviour. Our study identified a trend towards a decrease in levels of rumination in designs 1 and 2 following MBCT ($p = .055$, $p = .063$, respectively). An effect size of similar magnitude to that observed in BDI was calculated (Cohen's $d = 1.16$), which gives further weight to the hypothesized importance of rumination in mediating the reduction in depression. This hypothesis will require further exploration in larger future studies. Aside from its proven use in recovered recurrently depressed patients in the primary care setting, our findings suggest that MBCT may be of use in the psychiatric outpatient setting in patients with residual depressive symptomatology, and that its efficacy may be mediated by the effect of mindfulness on rumination (Figure 4).

Limitations

This is a preliminary study in the field of MBCT, and larger numbers of patients will need to be involved in similar projects before definite conclusions may be reached. However, our preliminary findings are promising. Ideally, the TAU group would have received a placebo therapy to eliminate the possibility of the Hawthorne effect, but unfortunately this was not possible due to limited resources. It would also have been preferable to have allocated the patients to the treatment conditions on a random rather than a consecutive basis, but time limitations prevented this from being possible, and independent t tests did indicate group equivalence at the outset. Longer-term follow-up would also be of benefit in terms of determining whether

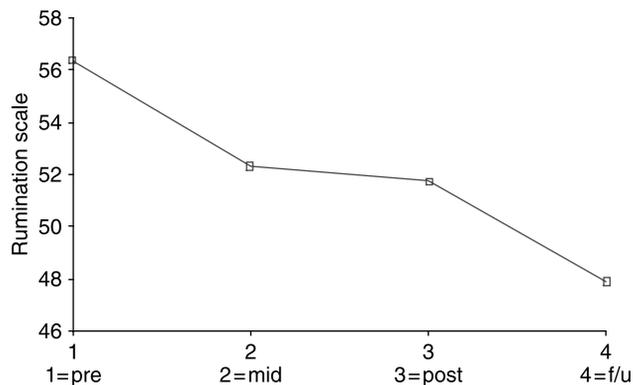


Figure 4. Effect of MBCT on rumination for both groups from baseline to 1-month follow-up.

this intervention is as useful in the long term in this patient group as it appears to be in the short term, given the fact that residual symptoms in depression are a long-term problem.

Conclusions

Whilst further evaluation will be necessary, MBCT is an intervention that may increase the range of possibilities open to psychiatrists when treating patients with residual depressive symptoms population. Whilst this was not a cost-effectiveness study, it was a resource-efficient intervention to deliver, both in terms of cost and therapist hours, as well as proving acceptable to the patients involved in the study.

Clinical implications

- MBCT has a significant effect on residual depressive symptoms in recurrently depressed patients, as well as reducing rates of relapse.
- It is important to be aware of the role of rumination in vulnerability to relapse in recurrent major depression.
- This was an acceptable, time-effective and cheap intervention.

Limitations

- The numbers in this study were small.
- The groups were not randomized, but rather a consecutive series methodology was used.
- Rumination may vary with depression rather than with mindfulness skills.
- Diagnoses were based on consultant psychiatrist opinion rather than formal objective assessment.

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