Cognitive Predictors of Change in Cognitive Behaviour Therapy and Mindfulness-Based Cognitive Therapy for Depression

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Background: An appreciation of cognitive predictors of change in treatment outcome may help to better understand differential treatment outcomes. The aim of this study was to examine how rumination and mindfulness impact on treatment outcome in two group-based interventions for non-melancholic depression: Cognitive Behaviour Therapy (CBT) and Mindfulness-Based Cognitive Therapy (MBCT). **Method:** Sixty-nine participants were randomly allocated to either 8-weekly sessions of group CBT or MBCT. Complete data were obtained from 45 participants (CBT = 26, MBCT = 19). Outcome was assessed at completion of group treatments. **Results:** Depression scores improved for participants in both group interventions, with no significant differences between the two treatment conditions. There were no significant differences between the interventions at post-treatment on mindfulness or rumination scores. Rumination scores significantly decreased from pre- to post-treatment for both conditions. In the MBCT condition, post-treatment rumination scores were significantly associated with post-treatment mindfulness scores. **Conclusions:** Results suggest that decreases in rumination scores may be a common feature following both CBT and MBCT interventions. However, post-treatment rumination scores were associated with post-treatment mindfulness in the MBCT condition, suggesting a unique role for mindfulness in understanding treatment outcome for MBCT.

Keywords: Predictors of change, mindfulness-based cognitive therapy, cognitive behaviour therapy, depression; mindfulness.

Introduction

Cognitive Behaviour Therapy (CBT) is one of the most popular and effective psychological interventions for mild to moderate depression (Beck, 2005). CBT is thought to ameliorate depression by addressing negative thinking styles, such as dysfunctional attitudes and negative automatic thoughts (Beck, 2005).

Another psychological intervention that appears to be gaining support in the management of depression is Mindfulness-Based Cognitive Therapy (MBCT) (Segal, Williams and Teasdale, 2002). The goal of MBCT is to cultivate mindfulness through awareness of current, moment-to-moment experiences in order to prevent relapse to depression (Segal et al., 2002).

CBT challenges the content of thoughts whilst MBCT encourages participants to observe their thoughts, without challenging or changing them, and so suggests a different mechanism of action. Increased levels of mindfulness have been found following treatment with MBCT along with corresponding lower levels of rumination (Eisendrath et al., 2008) but the role of mindfulness in CBT interventions has yet to be explored.

The aim of this study was to examine the relationship between depression, rumination and mindfulness scores post-treatment in depressed participants assigned to either a MBCT or CBT group interventions. It was hypothesized that lower post-treatment depression scores in those allocated to the MBCT condition would be associated with higher mindfulness and lower rumination scores, whilst lower post-treatment depression scores for those allocated to the CBT condition would be associated with lower rumination scores.

Method

Participants

Participants were recruited through community advertisements and by referral from general practitioners in Sydney, Australia. To be included in the study, participants had to be 18 years or older; be proficient in English; meet DSM-IV criteria for MDD on the Composite International Diagnostic Interview (CIDI)(World Health Organization, 1997); score 20 or higher on the BDI-II (Beck, Brown and Steer, 1996); have experienced depressive symptoms for at least the last 3 months preceding assessment; be under supervision by a health professional; and, finally, be able to commit to an 8-week group-based program. Participants were excluded from the study if they had a history of psychotic illness; a current diagnosis of melancholic depression (due to its putative biological etiology), bipolar disorder, pre- or post-natal depression; were currently experiencing active suicidal ideation; had commenced anti-depressive medication (or had changed their medication) in the 3 months preceding assessment; were currently hospitalized; were currently drug or alcohol dependent; used daytime anxiolytics, antipsychotic, or mood stabilizing medication; had a history of treatment with three or more antidepressants (may be indicative of treatment resistant depression); and, finally, had engaged in more than four sessions of regular CBT, mindfulness or meditation/relaxation in the past 12 months. All participants consented to their involvement in the study, which was approved by the University of NSW Human Research Ethics Committee (HREC 05269).

Procedure

The BDI-II was used to screen participants (Beck et al., 1996), using a cut-off score of 20 or more. Following screening, participants' diagnoses were confirmed with the CIDI (WHO, 1997) (see below) to screen out participants with melancholic depression or bipolar disorder. The remaining self-report measures were completed at home by participants with instruction that they be returned within 2 weeks. Once returned, participants were randomly allocated to either the CBT or MBCT conditions. Post-treatment outcome measures were completed upon termination of group treatments.

Measures

Self-report measures:.

1. Demographic information questionnaire.
2. Beck Depression Inventory II (BDI-II) (Beck et al., 1996).
3. Mindful Attention Awareness Scale (MAAS) (Brown and Ryan, 2003).
4. Rumination Response Style Questionnaire (RRS) (Nolen-Hoeksema and Morrow, 1991).

Structured Interviews:.

1. Composite International Diagnostic Interview (CIDI) (WHO, 1997). The CIDI – AUTO was administered via interviewer to assess diagnoses of anxiety and depressive disorders using DSM-IV criteria.

Treatments

Each of the 8-week treatment sessions was conducted in groups of up to eight participants and lasting 2 to 2.5 hours, with 11 groups being conducted overall. The CBT condition was conducted by two clinical psychologists with extensive experience in group-based CBT treatment, while the MBCT sessions were led by an experienced clinical psychologist with significant experience in group-based MBCT and co-facilitated by either a medical or a psychology student. All sessions were held at the Black Dog Institute in Sydney and were matched for duration.

The MBCT group treatment was a modified version of the 8-week MBCT course developed by Segal et al. (2002). For the CBT condition an 8-week program was developed based on standard CBT techniques described by Beck, Rush, Shaw and Emery (1979). Further details of the treatments administered and treatment fidelity have been described elsewhere (Manicavasgar, Parker and Perich, 2011).

Results

The sample characteristics for this study have been reported elsewhere (Manicavasgar et al., 2011). One hundred and sixty-three people were screened for the study. Sixty-four participants did not meet study criteria (most common exclusion criteria included having an alternative diagnosis, such as bipolar disorder, scoring lower than 20 on the BDI-II, having a history of depression but not currently depressed, and currently engaged in psychological therapy). An additional 12 participants withdrew prior to the interview (reasons cited included being unable to travel to the study site, being unable to attend during the proposed group therapy times and inability to obtain childcare).

Ninety-five completed the baseline assessments and 69 were enrolled in the group therapy programs (26 dropped out prior to randomization with reasons cited including work commitments and medication changes). Thirty-nine participants were randomly allocated to the CBT and 30 to the MBCT condition. Sixteen participants (23%) dropped out during the treatment study (4 from the MBCT group and 12 from the CBT group program). Overall, 45 participants completed the group therapy programs (CBT = 26, MBCT = 19).

Table 1. Baseline and post-treatment mean scores

	CBT (n = 26)				MBCT (n = 19)			
	Pre *M*	*SD*	Post *M*	*SD*	Pre *M*	*SD*	Post *M*	*SD*
BDI-II	36.23	11.11	23.62	16.83	32.42	9.01	21.21	13.83
Mindfulness	2.80	1.04	3.53	1.06	3.32	0.71	3.72	0.81
Rumination	64.11	12.96	53.85	16.82	59.47	11.03	50.94	16.46

Baseline characteristics

Sixteen participants (36%) were male and 29 (64%) were female; 30 (67%) were not married, 15 (33%) were currently married, and 27 (60%) were currently employed, with 18 (40%) being unemployed or retired. There was no significant difference between the conditions on any demographic variables (age, gender, employment status or marital status). Mean age of completers for the CBT condition was 45 (*SD* 12.9) years and for the MBCT condition 47 (*SD* 13.8) years. There was no significant difference in mean age or in baseline depression between the two treatment conditions.

Independent samples *t*-tests conducted on the BDI-II, mindfulness and rumination measures found no significant differences between the MBCT and CBT conditions at baseline on any of these variables. Baseline mean scores are presented in Table 1. Baseline rumination and mindfulness scores were not significantly correlated ($r = -.17$, $p = .21$).

Treatment outcomes

Mean BDI-II scores significantly decreased from baseline to post-treatment for both the CBT ($t = 4.6$, $df = 25$, $p < .001$) and the MBCT ($t = 4.8$, $df = 18$, $p < .001$) conditions (see Table 1). There were no significant differences between the two conditions on post-treatment BDI-II scores (as reported in Manicavasgar et al., 2011).

A MANOVA conducted on post-treatment rumination and mindfulness scores by treatment condition found a significant difference between pre- to post-treatment rumination scores (Pillai's Trace $= .190$, $F(2,40)$ 4.68, $p = .02$) for both conditions (see Table 1). There was no significant difference pre- to post-treatment for mindfulness scores and no significant difference between the treatment conditions on rumination or mindfulness scores at post-treatment.

Step-wise linear regressions were conducted for the CBT and MBCT conditions with post-treatment BDI-II scores as the dependant variable and post-treatment mindfulness and rumination scores as predictor variables. For the CBT condition, post-treatment rumination was a significant predictor of post-treatment depression scores ($\beta = -.757$, $t(24)$ 5.67, $p < .001$) with rumination explaining a significant portion of variance ($R^2 = .57$, $F(1,24)$ 32.13, $p < .001$). Post-treatment rumination was also a significant predictor of post-treatment depression scores in the MBCT condition ($\beta = -.757$, $t(18)$ 8.54, $p < .001$) with rumination explaining a significant portion of variance ($R^2 = .81$, $F(1,18)$ 72.93, $p < .001$). Post-treatment mindfulness was not a significant predictor of post-treatment BDI-II scores for either condition.

Linear regressions for the CBT and MBCT conditions with post-treatment rumination as the dependant variable and post-treatment mindfulness as the predictor variable were also conducted. No significant relationship was found for the CBT condition. However, for the MBCT condition, post-treatment mindfulness was a significant predictor of post-treatment rumination ($\beta = -10.02$ $t(18)$ -2.319, $p = .03$) explaining a significant portion of variance in rumination scores ($R^2 = .24$, $F(1,18)$ 5.38, $p = .03$).

Discussion

Participants in both the CBT and MBCT interventions improved following the 8-week treatment program, with participants in both conditions demonstrating equal improvements in depression and rumination scores. This is consistent with the notion that rumination in depression may be addressed via a number of different psychotherapies, including MBCT and CBT (Nolen-Hoeksema, Wisco and Lyubomirsky, 2008) and demonstrates that both treatments may be equally effective at reducing rumination.

Surprisingly, mindfulness did not seem to change as a result of MBCT treatment. Others such as Eisendrath et al. (2008) have found that mindfulness scores increased following treatment with MBCT. However, the mindfulness measure used in their study assessed domains of mindfulness such as acceptance and openness, whereas the MAAS, used in this study, assessed the domains of mindful attention and awareness. Further research is required to investigate the impact of treatment on the different domains of mindfulness captured in the different measures.

The CBT condition returned similar mindfulness scores post-treatment to those allocated to the MBCT condition following treatment, with neither condition showing significant improvements on this variable. Post-treatment rumination was the only significant predictor of post-treatment depression scores for both treatment conditions, and mindfulness was found to predict rumination scores for the MBCT condition, but not the CBT condition. This may suggest that rumination is a mechanism of change for both therapies, yet it may also indicate that as a consequence of lowering depression, rumination scores will lower. However, mindfulness scores appeared to be associated with rumination scores only for those assigned to the MBCT condition, suggesting a unique role for mindfulness in understanding the relationship between rumination and MBCT treatment outcome. Further research is needed to elucidate these mechanisms of change.

Although a limitation of this study was the high drop-out rate, our findings tentatively suggest that the effectiveness of both CBT and MBCT as a treatment for depression may be specifically associated with changes in rumination. Further work is needed to examine the differing mechanisms through which CBT and MBCT may be operating through to provide treatment gains in depression.

Acknowledgements

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