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## The effects of mindfulness-based stress reduction therapy on mental health of adults with a chronic medical disease: a meta-analysis

*Bohlmeijer E, Prenger R, Taal E, Cuijpers P*

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### CRD summary

The review concluded that mindfulness-based stress reduction had small effects on depression, anxiety and psychological distress in people with chronic medical diseases. This result was based on a small number of studies with diverse population and some methodological flaws. The authors' conclusions should be regarded as suggestive rather than definitive as the results may have been overestimated.

### Authors' objectives

To examine the effectiveness of mindfulness-based stress reduction on depression, anxiety and psychological distress in adults with different chronic medical diseases.

### Searching

MEDLINE and PsycINFO were searched from inception through to 2008 using the search terms "mindfulness" and "randomised controlled trial". The primary studies used in the previous review as well as the references of the retrieved studies were examined for further studies.

### Study selection

Randomised controlled trials (RCT) that compared mindfulness-based stress reduction with control in adult patients with a chronic medical disease were eligible. Studies had to report sufficient data to enable the calculation of standardised effect sizes.

The term chronic illness in this review referred to any conditions which involved some disability, caused by irreversible pathological changes, which also included cancer. The outcomes of interest were overall psychological distress, depression and anxiety. Most participants were women and had a mean age between 45 and 55. Studies included patients with a variety of chronic medical conditions namely cancer, chronic pain, fibromyalgia, chronic fatigue and rheumatoid arthritis. Seven studies used waiting list control and one study used education support group as a control. All included studies used different outcome measurement tools to assess the level of anxiety and depression.

Two reviewers were involved in the study selection; any disagreements were resolved by consensus.

### Assessment of study quality

The study quality was assessed using seven criteria based on an authoritative review of empirically supported psychotherapies and also the criteria proposed by the Cochrane Collaboration to assess the methodological validity of the study which included randomisation, allocation concealment, statistical power, intention-to-treat analysis, whether participants met the diagnostic criteria, whether the study used the trained therapists and a recommended treatment manual. The study quality was assessed as high (all seven criteria were met), medium (five or six criteria were met) and low (four or less criteria were met).

Two reviewers independently assessed study quality.

### Data extraction

The data were extracted to calculate effect sizes (Cohen's *d*; where 0.56 to 1.2 was considered larger, 0.33 to 0.55 was moderate and 0 to 0.32 was small) and their 95% confidence intervals. These were corrected for small-sample bias using Hedges' *g*. If no means and standard deviation were reported, other test statistics ( $X^2$ , *T*, *F*) were converted into Hedges' *g*.

It appeared that two reviewers independently extracted data.

### Methods of synthesis

Pooled Hedges'  $g$  effect size and their 95% confidence intervals were calculated using the random-effects model. Heterogeneity was assessed using  $Q$  and  $I^2$ ;  $I^2$  of 0% indicated no heterogeneity, 25% indicated low, 50% moderate and 75% high heterogeneity. Meta-regression was used to assess the influence of the study quality.

### Results of the review

Eight RCTs were included in the review (17 to 200 participants). One study was rated as high quality, five studies as medium quality and two studies as low quality. In one study, attrition rate was higher than 25%.

The studies showed a small statistically significant effect of mindfulness-based stress reduction on depression ( $d=0.26$ , 95% CI 0.18 to 0.34; six RCTs;  $I^2=0\%$ ), and psychological distress ( $d=0.32$ , 95% CI 0.13 to 0.50; three RCTs;  $I^2=0\%$ ). The studies showed a moderate statistically significant effect on anxiety ( $d=0.47$ , 95% CI 0.11 to 0.83; four RCTs;  $I^2=53.95\%$ ). When the low quality studies were excluded the effect size reduced down to 0.24 for anxiety.

### Authors' conclusions

It could be concluded that mindfulness-based stress reduction had small effects on depression, anxiety and psychological distress in people with chronic medical diseases. Integrating mindfulness-based stress reduction in behavioural therapy may enhance the efficacy of mindfulness based interventions.

### CRD commentary

The review addressed a clear question and was supported by appropriate inclusion criteria. Relevant sources were searched, but unpublished studies were not searched so relevant studies may have been missed. It was unclear whether language restrictions were applied, so language bias could not be ruled out. Attempts were made to minimise reviewer errors and bias in the review process. Appropriate methods were used to assess study quality and the results were used in reporting the study findings.

Due to the clinical diversity, it might not have been appropriate to pool the trials. Also the included studies had small sample sizes (the largest was 200). The authors noted that most of the studies had methodological flaws and poor-quality studies tended to overestimate the effects of the treatment. Long-term effects of mindfulness-based stress reduction were not reported

In view of these limitations, the authors' conclusions should be regarded as suggestive rather than definitive as the results may have been overestimated.

### Implications of the review for practice and research

**Practice:** The authors recommended that integrating the mindfulness-based stress reduction program in cognitive behaviour therapy may enhance the efficacy of mindfulness-based interventions.

**Research:** The authors stated that further studies should include sufficient people with moderate to high levels of anxiety and depression to prevent the ceiling effect, and also to include follow-up measurements. In addition, future studies should target people with similar chronic medical diseases to enable further evaluation of mindfulness based interventions

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