The effect of mindfulness-based therapy on anxiety and depression: a meta-analytic review

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CRD summary
This review found that mindfulness-based therapy was a promising intervention for treating anxiety and mood problems in clinical populations. These conclusions should be interpreted with caution due to limitations in the quality assessment and lack of details on study design of the included studies, especially those that included a comparator group.

Authors' objectives
To determine the effectiveness of mindfulness-based therapy (derived from Buddhist and yoga practices) for anxiety and mood symptoms.

Searching
PubMed, PsycINFO and the Cochrane Library were searched, from inception to April 2009, for published studies. Search terms were reported. Bibliographies of retrieved studies and review articles were screened.

Study selection
Studies that assessed a mindfulness-based intervention delivered in adults (18 to 65 years) with a diagnosable psychological or physical/medical disorder were eligible for inclusion. Eligible studies had to include a measure of anxiety and/or mood symptoms pre- and post-intervention, and provide sufficient data to calculate effect sizes. Studies in which the mindfulness-based intervention was coupled with treatment using acceptance and commitment therapy or dialectical behaviour therapy were excluded. If studies provided insufficient outcome data to allow inclusion, authors were contacted for further information. Studies in which mindfulness-based therapy was delivered in two or fewer sessions were excluded.

Participants in the included studies had cancer, generalised anxiety disorder, depression, chronic fatigue syndrome, panic disorder, fibromyalgia, chronic pain, social anxiety disorder, attention-deficit/hyperactivity disorder, binge eating disorder, bipolar disorder, diabetes, heart disease, hypothyroidism, insomnia, organ transplant, stroke and traumatic brain injury; some studies included patients with more than one of these conditions. Most studies assessed mindfulness-based cognitive therapy or mindfulness-based stress reduction. Comparison interventions in studies that included a comparator arm were waiting list control groups, usual treatment, study drop-outs, healing through creative arts, educational group with relaxation training, education programmes, and cognitive behavioural group therapy. The number of treatment sessions ranged from six to 12, with some studies including three hour or one day retreats. A variety of scales were used to assess anxiety and depression.

The authors did not state how studies were selected for inclusion in the review.

Assessment of study quality
Two reviewers independently assessed methodological quality using a modified Jadad score, which covered randomisation, blinding and drop-outs/withdrawals. Studies were assigned a score out of 5 points according to the number of items fulfilled.

Data extraction
Numerical data were extracted to analyse changes from pre- to post-treatment or follow-up. Where possible, data were also analysed on an intention-to-treat basis with last observation carried forward. Effect sizes were estimated using Hedges' g with 95% confidence interval (CI).

Multiple reviewers were involved in data extraction but it was unclear whether this was done independently.

Methods of synthesis
Summary effect sizes were estimated using a random-effects model. Meta-regression was used to examine the association of effect sizes with the following variables: type of mindfulness-based therapy, study year, number of treatment sessions, study quality, and disorder targeted by the intervention. Studies were assessed to determine whether
anxiety and depression were elevated pre-treatment.

Scores and 95% confidence intervals of measures, plus anxiety and depression used in studies of patients with conditions other than anxiety or mood disorders, were compared with scores that marked an elevated level. If the lower bound of the 95% confidence interval was greater than or equal to the cut-off score, the sample was considered to have an elevated level of anxiety or depression pre-treatment. Where different thresholds were recommended for men and women, the higher threshold was used. Publication bias was assessed using a funnel plot, the fail-safe N, and Trim and Fill method.

**Results of the review**
Thirty-nine studies were included in the review (n=1,140 patients), 16 comparative studies (most compared with no intervention) and 24 uncontrolled studies. Jadad scores ranged from 0 to 3 out of 5 points, with the majority of studies scoring 1; only three studies scored 3. Details on individual items were not reported.

Mindfulness-based therapy resulted in a significant improvement in anxiety (effect size 0.63, 95% CI 0.53 to 0.73) and depression (0.59, 95% CI 0.51 to 0.66), based on pre-post intervention differences for controlled and uncontrolled studies.

Estimates were similar in subgroups of studies that used mindfulness-based therapy in patients showing elevated levels of anxiety (10 studies) or depression (eight studies) pre-treatment.

Effects on anxiety and depression remained significant when the analysis was restricted to the 16 studies that included a control group or the 19 studies that reported data at longer term follow-up (mean of 27 weeks).

Moderator analysis showed that mindfulness-based therapy produced significant reductions in anxiety for patients with anxiety disorders (seven studies), cancer (eight studies) and pain disorders (five studies), but not in patients with depression (one study). Similar analysis showed that mindfulness-based therapy produced significant reductions in depression in patients regardless of symptom type. Analysis by type of mindfulness-based therapy found that both mindfulness-based cognitive therapy and mindfulness-based stress reduction were effective for reducing anxiety and depression. Study quality, publication year and treatment duration were not associated with treatment effectiveness.

There was no evidence of publication bias.

**Authors’ conclusions**
The results suggested that mindfulness based therapy was a promising intervention for treating anxiety and mood problems in clinical populations.

**CRD commentary**
This review addressed a broad question, supported by inclusion criteria defined in terms of participants, intervention and outcomes. Details on eligible study designs and designs of included studies were lacking. The literature search was adequate, but restriction of the review to published studies meant that publication bias was a possibility; this was assessed in the review. Appropriate steps were taken to minimise bias and errors for the quality assessment, but it was unclear whether similar steps were taken when selecting studies and extracting data.

Study quality was assessed using the Jadad scale, which was designed for randomised controlled studies. However, as most studies were uncontrolled in design and it was unclear whether controlled studies used a randomised design, the appropriateness of this assessment was questionable. Appropriate methods were used to pool data from uncontrolled studies, but it was unclear whether the analysis of controlled studies took into account the comparative nature of these studies, or whether it was based solely on data from the intervention arms.

The authors’ conclusions were supported by the data, but should be interpreted with caution due to limitations in the quality assessment and lack of details on study design of the included studies, especially those that included a comparator group.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.
Research: The authors stated that future studies are needed to clearly establish the efficacy of mindfulness based therapy in randomised controlled trials.

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