Meditation programs for psychological stress and well-being: a systematic review and meta-analysis

CRD summary
The review concluded that meditation programmes resulted in small to moderate reductions of multiple negative dimensions of psychological stress in diverse adult clinical populations. The authors' conclusions reflect the evidence for comparisons of nonspecific active controls but do not reflect the uncertainty associated with other outcome measures and comparators.

Authors' objectives
To evaluate the efficacy of meditation programmes in improving stress-related outcomes in diverse adult clinical populations.

Searching
Eight databases including MEDLINE, PsycINFO and the Cochrane Library were searched to June 2013 for articles in any language. Search strategies were reported in an accompanying report (see Other Publications of Related Interest). Reference lists of included studies and relevant reviews were scanned. ClinicalTrials.gov was searched for unpublished articles.

Study selection
Eligible studies were randomised controlled trials that compared structured meditation programmes against active controls (matched for time and attention to intervention) for adults (18 years or older) with a medical or psychiatric diagnosis or with stress-related symptoms that may not have been medically or psychiatrically diagnosed. Medication programmes had to consist of a minimum of four hours of training with instructions to practice outside the training sessions and could include mindfulness based programmes, mantra-based programmes and other meditation programmes. Programmes where meditation was not the foundation or major part of the intervention were excluded.

Interventions varied between studies and included mindfulness-based stress reduction, cognitive therapy or meditation; mantra; and transcendental medication. Control groups included non-specific active comparisons such as education and support and specific active comparisons such as relaxation, cognitive behavioural therapy, exercise or drugs. Outcomes were measured by a wide variety of tools. Patients included those with anxiety, depression, stress, chronic worry and insomnia, smokers, alcoholics, chronic pain or mixed populations with diverse medical conditions including heart disease, lung disease, breast cancer, diabetes mellitus, hypertension and HIV.

Two reviewers independently screened studies for inclusion. Differences were resolved through consensus.

Assessment of study quality
Trial quality was assessed using the Cochrane Risk of Bias tool and the Methods Guide for Comparative Effectiveness Reviews. Study quality was graded good, fair or poor. An overall grade of high, moderate or low level of evidence was assigned to each trial based on risk of bias, directness, consistency and precision.

Two reviewers assessed quality.

Data extraction
Data were extracted for relevant outcomes to enable calculation of standardised mean differences (SMD) in change scores between intervention and control groups using Cohen’s d. A relative difference of 5% in change score was considered to be clinically significant. Trials were grouped by type of control: nonspecific active (such as education or attention control) or specific active (such as exercise or progressive muscle relaxation).

Two reviewers independently extracted data.
Methods of synthesis
Pooled standardised mean differences and 95% confidence intervals were calculated using a random-effects analysis. Statistical heterogeneity was assessed using the I² statistic.

Results of the review
Forty-seven trials (3,515 participants) were included in the review. Ten trials were rated good quality, 24 were rated fair and 13 were rated poor. Trial duration ranged from three weeks to 5.4 years but most were reported to be short term.

Comparison with nonspecific active controls: Mindfulness meditation programmes had moderate evidence of improved anxiety (SMD 0.38, 95% CI 0.12 to 0.64 at eight weeks; seven trials and SMD 0.22, 95% CI 0.02 to 0.43 at three to six months; four trials), depression (SMD 0.30, 95% CI 0.00 to 0.59 at eight weeks; eight trials and SMD 0.23, 95% CI 0.05 to 0.42 at three to six months; five trials) and pain (SMD 0.33, 95% CI 0.03 to 0.62; four trials) and low evidence of improved stress/distress and mental health-related quality of life.

There was low evidence of no effect or insufficient evidence of any effect of meditation programmes on positive mood, attention, substance use, eating habits, sleep and weight gain. There was insufficient evidence that medication programmes had an effect on health-related behaviours affected by stress, including substance use and sleep.

There was low evidence of no effect or insufficient evidence of an effect for mantra meditation programmes on any psychological stress or well-being outcomes.

Comparison with specific active controls: There was low evidence of no effect or insufficient evidence that any of the meditation programmes were more effective than exercise, progressive muscle relaxation, cognitive-behavioural therapy or other specific comparators in changing any of the outcomes of interest. There was no evidence of any potential harm reported in the nine trials evaluating this outcome.

Statistical heterogeneity was low to moderate for all the analyses (I²<58%).

Authors’ conclusions
Meditation programmes resulted in small to moderate reductions of multiple negative dimensions of psychological stress.

CRD commentary
The review question was clear with adequately reported inclusion criteria. Several relevant sources were searched with no language restrictions. Some efforts were made to locate unpublished data. Formal assessment of publication bias was not conducted due to the small number of studies for some outcomes. Appropriate methods to reduce reviewer error and bias were used throughout the review process. Trial quality was assessed. The authors’ reported that the main biases were lack of blinding of outcome assessment, high attrition, lack of allocation concealment and lack of intention-to-treat analysis.

The methods of analysis appeared appropriate. The authors reported variation between trials in terms of interventions, participants and methods of reporting outcomes. Many trials were short-term only. Some outcomes reported lower effectiveness at longer term follow-up.

The authors’ conclusions reflect the evidence for nonspecific active controls but do not reflect the uncertainty associated with other outcome measures and comparators.

Implications of the review for practice and research
Practice: The authors stated that clinicians should be aware that meditation programmes could result in small to moderate reductions in multiple negative dimensions of psychological stress. Therefore, clinicians should be prepared to talk with their patients about the role that a meditation programme could have in addressing psychological stress.

Research: The authors stated that more robust study designs were needed to determine the effects of meditation programmes in improving the positive dimensions of mental health and stress-related behaviour. Further studies in primary care and disease specific populations are required to address uncertainties caused by inconsistencies in the evidence. Trainer expertise, amount of practice and skill needed investigation. Trials needed to document the amount of
training that instructors provide and patients receive and the amount of home practice completed by patients.

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