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## Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis

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### CRD summary

This review concluded that the technique of mindfulness-based stress reduction was able to reduce stress levels in healthy people. The authors advised that further more rigorous research was needed to determine any long-term specific effects. Given limitations in the included studies and conduct of the review, the authors' conclusions should be treated with caution.

### Authors' objectives

To assess current evidence for mindfulness-based stress reduction (MBSR) in healthy people

### Searching

MEDLINE, Web of Knowledge and The Cochrane Library were searched from 1979 to September 2008 for studies published in English. Search terms were reported. References of retrieved articles were checked for additional references.

### Study selection

Eligible studies had to investigate a MBSR intervention, be performed in healthy populations, use validated scales for measurement of stress and provide quantitative data. Studies that combined MBSR and another active treatment were excluded. Controlled studies could have an active or inactive control group. No further restrictions were imposed on study design. Primary outcomes were stress reduction and spirituality enhancement (defined in the paper). Secondary outcomes were rumination, empathy, self-compassion, state anxiety and further psychological changes related to the MBSR programme.

The authors did not state how studies were selected.

MBSR was compared mostly to a waiting list control group. Populations varied and included university staff and students, health care staff or students and pregnant women. Study duration ranged from four to 10 weeks. Where specified, follow-up was of three months duration. Measures of stress varied. Measures of spirituality, where stated, tended to be Index of Core Spirituality (INSPIRIT) or Mindfulness Attention Awareness Scale (MAAS).

### Assessment of study quality

The quality of controlled studies was assessed with the Jadad scale (up to a total of 5 points for randomisation, blinding and intention to treat analysis). The quality of cross-sectional studies was assessed using Newcastle-Ottawa scale and considered representativeness, comparison groups, methods of outcome assessment and follow-up (up to 9 points). A score of at least 3 on either scale was considered high quality.

The authors did not state how many reviewers performed validity assessment.

### Data extraction

Variables were extracted or calculated from tables in individual studies. Effect sizes expressed as Cohen's *d* were calculated for each treatment and control group.

The authors did not state how many reviewers were involved in data extraction.

### Methods of synthesis

To be eligible for statistical pooling, studies had to provide both pre- and post-test outcome variables or effect size

expressed as Cohen's *d* between post- and pre-test within-group differences. Any studies that did not provide this information were included in the narrative synthesis only, as were data defined as secondary outcome measures.

Effect sizes in MBSR interventions and control groups were compared using *t* tests weighted for the number of participants with standard deviations imputed where necessary. Statistical analysis was performed on the completers' samples. A sensitivity analysis was conducted on randomised controlled trials (RCTs) only.

### **Results of the review**

Ten trials were included (*n*=671): seven RCTs; two controlled trials; and one uncontrolled trial. Study quality was generally low; Jadad scores ranged from 0 to 3. Only one of the controlled trials scored 3 and was rated as high quality. One open label uncontrolled trial was evaluated on the Newcastle-Ottawa scale and scored 0. Across the trials, specific issues were related to small sample sizes, self-selection in some of the trials, non randomisation and the difficulty of blinding.

MBSR for the reduction of stress (seven trials): MBSR had a significant positive effect compared to waiting-list treatment (0.743 +/- 0.77 versus -0.208 +/- 0.21, *t*=21.01, *p*≤0.001). Analysis restricted to RCTs showed similar results. One trial compared MBSR and active treatment and did not show any statistically significant differences between treatments.

MBSR for the enhancement of spirituality (five trials): MBSR was statistically significantly superior to inactive control (0.824 +/- 0.83 versus -0.043 +/- 0.37, *t*=9.95, *p*< 0.000001). Analysis restricted to RCTs showed similar results. One trial compared MBSR with relaxation training and found no statistically significant differences on the INSPIRIT measure.

Further results from individual studies were reported for the secondary outcomes.

### **Authors' conclusions**

MBSR was able to reduce stress levels in healthy people. Studies were limited in terms of quality and further research was needed to address quality issues and determine any long-term specific effects.

### **CRD commentary**

This review had broadly defined inclusion criteria for population, intervention, outcomes and study designs. Searching encompassed a number of databases and included reference checking. It was unclear whether unpublished material was included, which opened up the possibility of publication bias. Only articles in English were eligible, which risked language bias. It was unclear whether more than one reviewer was involved in the processes of study selection, data extraction and validity assessment to minimise bias and error. Trials were combined despite variation in populations, intervention delivery, outcome measure and study designs, although a sensitivity analysis was conducted using RCTs only. Given limitations in the included studies and in the conduct of the review, the authors' conclusions should be treated with caution.

### **Implications of the review for practice and research**

Practice: The authors did not state any implications for practice.

Research: The authors stated that there was a need for rigorous adequately powered RCTs to determine magnitude of effect, any specific effects and possible predictors of response to MBSR. Further studies should focus on long-term effects of MBSR on healthy people and use more representative samples than those found in the current research (based most often on young women Caucasians).

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