



Review

Effectiveness of mindfulness-based stress reduction and mindfulness based cognitive therapy in vascular disease: A systematic review and meta-analysis of randomised controlled trials



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ABSTRACT

**Objective:** To determine the effectiveness of mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) on psychological and physical outcomes for people with vascular disease.

**Design:** Systematic review and meta-analysis of randomised controlled trials.

**Data sources:** AMED, CINAHL, EMBASE, British Nursing Index, Medline, Web of Science, PsycINFO, Cochrane Database of Systematic Reviews, Central, Social Sciences Citation Index, Social Policy and Practice, and HMIC from inception to January 2013.

**Review methods:** Articles were screened for inclusion independently by two reviewers. Data extraction and quality appraisal were performed by one reviewer and checked by a second with discrepancies resolved by discussion with a third if necessary. Random-effects meta-analyses were performed.

**Results:** Nine articles (from eight original randomised controlled trials) met eligibility criteria and were included in the final review. In total, 578 participants were enrolled across the trials, with participants presenting with prehypertension/hypertension (n = 3 trials), type 1 or 2 diabetes (n = 2), heart disease (n = 2) and stroke (n = 1). Meta-analyses, using standardised mean differences, showed evidence of reductions in stress (−0.36; 95% CI −0.67 to −0.09; p = 0.01), depression (−0.35; 95% CI −0.53 to −0.16; p = 0.003) and anxiety (−0.50; 95% CI −0.70 to −0.29; p < 0.001). Effects on physical outcomes (blood pressure, albuminuria, stress hormones) were mixed.

**Conclusion:** Whilst populations with vascular disease appear to derive a range of psychological benefits from MBSR/MBCT intervention, the effects on physical parameters of disease are not yet established. More robust studies, with longer term follow-up, are required to ascertain full effectiveness of such intervention.

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## Introduction

Vascular disease accounts for over a quarter of all deaths in westernised countries [1,2]. Moreover, both the disease itself and its associated clinical events, such as myocardial and cerebral infarction, are significant and distressing life events. Depression, anxiety, and psychological distress, in turn, are independent risk factors for vascular disease morbidity and mortality [3,4]. In recognition of this, many guidelines for conditions such as cardiac rehabilitation and hypertension include stress management as a part of recommended therapy [5, 6]. Equipping patients with skills and coping strategies to help reduce or manage perceived psychological stress may represent an important secondary prevention intervention. Although the most effective mode of stress reduction therapy is yet to be established, increasing recognition is being given to mindfulness therapy [7].

Mindfulness is defined as the capacity to intentionally be in the present moment without judgement [8]. Two of the main mindfulness-based approaches, which aim to cultivate mindfulness therapeutically, include Mindfulness-Based Stress Reduction (MBSR), and Mindfulness-Based Cognitive Therapy (MBCT). MBSR is a structured, manualised treatment programme originally developed for the management of chronic pain and now used widely to reduce psychological morbidity associated with chronic illnesses and to treat emotional and behavioural disorders [9]. MBCT, derived from MBSR, was designed for people with a history of recurrent depression to help prevent future recurrences [10]. The standard practice for both therapies is a group-based programme held over 8–10 weeks, with a weekly two hour session, inclusion of daily homework in the practice of mindfulness and a one day retreat [7]. MBSR and MBCT have been demonstrated to be effective therapies to treat anxiety and depression, in both clinical and non-clinical populations [11–13]. A meta-analysis on the effects of MBSR on mental health of adults with chronic disease showed small but positive effects on depression anxiety and psychological distress [14]. In addition, MBSR may also improve physiological aspects of vascular disease [15]. Indeed, randomised controlled studies of MBSR intervention have been shown to reduce blood pressure in low-income African-American older adults [16], and in community dwelling participants with stress related complaints [17].

In vascular disease, pilot and observational studies of MBSR and MBCT intervention have been associated with improvements in perceived health, quality of life and physiological responses in stroke survivors [18,19], and in reductions of patient reported diabetes-related distress [20]. MBSR has also been associated with lowered blood pressure and better glycaemic control in patients with diabetes [21]. However, with a predominance in the evidence base of small non-randomised studies, the efficacy and treatment effects are as yet to be fully understood. The purpose of this systematic review was to establish whether

MBSR and MBCT are effective in the management of both depressive and physical symptoms in individuals with vascular disease and those at high risk of vascular disease.

## Methods

The systematic review was conducted following the general principles published by the NHS Centre for Reviews and Dissemination [22]. The protocol for this review was developed in consultation with two experts in MBCT and MBSR (see <http://clahrc-peninsula.nihr.ac.uk/effectiveness-of-mindfulness-based-stress-reduction-and-mindfulness-based-cognitive-therapy-in-vascu.php>). The protocol is registered with Prospero (registration no. CRD4201300385).

### Types of studies

Only randomised controlled trials (RCTs) were included.

### Types of participants

For inclusion, participants had to have vascular disease, which for the purposes of this review included coronary heart disease, angina, myocardial infarction, stroke and peripheral vascular disease. People at a high risk of developing vascular disease including those with diabetes, hypertension and hypercholesterolaemia were also included.

### Types of interventions

Interventions that were described as either MBSR or MBCT were included for review. Shortened versions or amended versions of MBSR/MBCT interventions were also included, but interventions that were based on mindfulness but were not specific programmes of MBSR/MBCT were excluded.

### Outcome measures

Both quantitative and qualitative outcomes from RCTs were considered. Quantitative outcomes of interest were: psychological outcomes (e.g. anxiety, depression), physical outcomes (e.g. blood pressure, markers of disease status), measures of health service utilisation and quality of life. To be eligible for inclusion, studies had to report on either psychological or physical outcomes (or both). Qualitative outcomes of interest were views on, and experience of, individuals with vascular disease receiving MBCT/MBSR.

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