Abstract: P191

The effectiveness of mindfulness-based interventions on perceived stress, depression and anxiety in patients with coronary heart disease: A systematic review and meta-analysis

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Background: An increasing number of people are living with coronary heart disease (CHD) globally. Psychological conditions such as stress, depression, and anxiety are prevalent for people with CHD, which impose a great challenge for secondary prevention of CHD. Mindfulness-based interventions (MBIs), which incorporate mindfulness skills and cognitive or behavioural therapy, are suggested as a promising approach to help patients with CHD to improve their psychological health. However, the effectiveness of MBIs for patients with CHD has not been systematically reviewed.

Purpose: To synthesise the evidence regarding the effects of MBIs on reducing perceived stress, depression, and anxiety in patients with CHD.

Methods: Search was conducted in seven English electronic databases and two Chinese electronic databases from inception to January 2019. Randomized controlled trials (RCTs) that evaluated the effects of MBIs on stress, depression, and anxiety in adults with CHD were included. Two reviewers independently screened records for eligibility, extracted data, and assessed risks of bias using the Cochrane tool. Meta-analysis was conducted by combining the standard mean difference (SMD) with 95% confidence interval (CI) of post-intervention outcome measures using Review Manager Version 5.3. We used a fixed-effects model if no significant heterogeneity ($I^2 < 50\%$), while in case of significant heterogeneity ($50\% < I^2 < 75\%$), we used a random-effects model.

Results: Six RCTs involving 473 participants were included. Five of all studies compared MBIs with inactive controls (i.e., usual care and waitlist control). The remaining study utilized a self-help group that received a booklet containing identical mindfulness information as an active control. There were high concerns about the risk of bias across studies, mainly in performance bias and detection bias. The meta-analysis of two studies showed MBIs may reduce perceived stress at post-intervention (SMD -0.82; 95% CI -1.28 to -0.36; $P < 0.001$; $I^2$ 0%) compared with inactive controls. Compared with active control, the single study did not observe a significant reduction of perceived stress in intervention group. The meta-analysis of five studies revealed that MBIs appear effective in reducing depression (SMD -1.08; 95% CI -1.28 to -0.87; $P < 0.001$; $I^2$ 22%) and anxiety (SMD -1.16; 95% CI -1.57 to -0.75; $P < 0.001$; $I^2$ 71%) immediately after intervention, compared with inactive or active controls.

Conclusions: The results of this review provide evidence for the effects of MBIs on reduction in perceived stress, depression and anxiety at post-intervention in patients with CHD. However, these findings need to be interpreted with caution given the small sample size and methodological limitations within included studies. Rigorous-designed research is urgently needed to further confirm the effectiveness of MBIs on improving psychological health and explore its sustainable effects in patients with CHD.