Characteristics of psychological interventions that improve depression in people with coronary heart disease: a systematic review and meta-regression

CRD summary
This generally well-conducted review assessed which psychological treatments were most effective in improving depression in people with coronary heart disease. They concluded that psychological interventions had small and quite variable effects on depression; the evidence for cognitive behavioural therapy was strongest. The authors’ recommendation that their findings must be interpreted with caution should be heeded.

Authors' objectives
To determine which psychological treatments were most effective in improving depression and depressive symptoms in people with coronary heart disease.

Searching
Five databases, including EMBASE, Cochrane Register of Controlled Trials, and DARE were searched up to March 2012 with no language or publication restrictions. Search strategies were reported in a separate online appendix. Reference lists of included articles and relevant reviews were manually searched and citations traced.

Study selection
Eligible for inclusion were randomised controlled trials (RCTs) that compared the effects of psychological interventions versus a control group in patients with coronary heart disease (as defined in the review). Psychological interventions could be compared with usual care or waiting list. Psychological interventions could also be combined with medication or technology, in which case the control was medication or technology alone. Eligible trials had to include a standardised assessment of depression at baseline and follow-up. It was unclear, but it seemed that only English language articles were included.

Included participants had acute or stable coronary heart disease, or were people recruited before or after elective cardiac surgery. Some trials included only males or only females, and some included depressed and non-depressed participants. The mean age of participants varied from 50.9 to 69.7 years. Included interventions varied considerably in type and intensity. Depression was assessed using various measurement tools.

Two reviewers screened studies for inclusion.

Assessment of study quality
Trial methodology was assessed based on randomisation, treatment concealment, blinding of outcome assessors, and intention-to-treat analysis.

Two reviewers extracted data on trial methodology, with discrepancies resolved through discussion between reviewers and other team members, where necessary.

Data extraction
Continuous depression scores and standard deviations were extracted to calculate standardised mean differences and 95% confidence intervals. Data were coded as psychological or non-psychological according to 11 characteristics (such as general education, general discussion, behavioural therapy).

Where data were presented in alternative forms, appropriate transformations were made. Where data were presented for multiple time points, those reported nearest to six months after intervention were extracted. Where trials included two active treatment arms, control groups were divided between the two to avoid double counting. Primary authors were contacted for further details where necessary.

Two reviewers independently extracted outcome data, any discrepancies were resolved through discussion.
Methods of synthesis
Standardised mean differences and 95% confidence intervals were combined using a random-effects model. Statistical heterogeneity was assessed using Cochrane Q and I². Subgroup analyses were performed in depressed coronary heart disease patients. Multivariate meta-regression was performed to investigate the trial characteristics (such as intervention components, quality criteria) associated with improvements in depression.

Publication bias was assessed using funnel plots, Eggers test, and Duval-Tweedie trim-and-fill method.

Results of the review
Sixty-two RCTs with 64 comparison arms (17,397 participants, range 22 to 2,481) were included in the review. Twenty-six RCTs reported adequate treatment allocation, 27 RCTs used adequate methods for sequence generation, 24 RCTs used intention-to-treat analyses, and 20 RCTs blinded outcome assessors. Follow-up duration ranged from approximately five days to 12 months.

Psychological interventions showed a small but statistically significant improvement in depression (SMD 0.18, 95% CI 0.12 to 0.24; 64 trial arms), but there was some evidence of statistical heterogeneity (I²=51.4%). The intervention components associated with the small beneficial effects were problem solving, general education, skills training, exercise, cognitive behavioural therapy, and relaxation (SMDs ranged between 0.15 and 0.34).

Subgroup analyses in depressed coronary heart disease participants showed similar small beneficial effects with psychological interventions (SMD 0.21; 12 trial arms). The intervention components associated with small benefit were general education, behavioural therapy, cognitive behaviour, and relaxation (SMDs ranged from 0.29 to 0.52). Seven RCTs were considered to be of high methodological quality, subgroup analyses in these RCTs showed that only cognitive behavioural therapy had a significant effect (SMD 0.31; three RCTs).

Other results were reported in the review. There was evidence of publication bias.

Authors’ conclusions
Psychological interventions have small and quite variable effects on depression among patients with coronary heart disease. The treatment showing the most effect was cognitive behavioural therapy.

CRD commentary
The review question and inclusion criteria were clearly stated. A number of sources were searched for relevant literature, although it was unclear whether there were language restrictions. Formal assessment of publication bias showed some evidence of bias, suggesting that potentially relevant data may have been missed. Each stage of the review process was conducted in duplicate, which reduced the potential for reviewer error and bias.

Trial quality was assessed and was explored within the analyses. The authors acknowledged the variability between trials, and attempted to explore potential sources of heterogeneity. Some subgroup analyses included only a small number of trials, which reduced their robustness; the authors recommended that the small effect of psychological interventions must be interpreted with caution.

This was a generally well-conducted review and the authors’ conclusions reflect the evidence; the authors’ recommendation that the small effect of psychological interventions must be interpreted with caution should be heeded.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that more studies of psychological treatments among patients with coronary heart disease and depression were required, and should assess the influence of timing of treatment and patient characteristics on outcomes.

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