Effects of rehabilitation exercise programmes on anxiety and depression in coronary patients: a meta-analysis
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Authors’ objectives
(1) To estimate the effect size of exercise treatment on anxiety and depression as compared with other treatments, and to define minimal group sizes for further research projects. (2) To study how reported effect sizes are related to methodological characteristics of the studies, e.g. duration of the exercise programme, time for follow-up, sample size, design features or publication year.

Searching
MEDLINE and PsycINFO were searched up to March 1993 (search dates are unclear).

Study selection
Study designs of evaluations included in the review
Three different study designs were included: pre-post design without control group; pre-post design with control group; and pre-post design with different treatment groups, which applied different exercise programmes and compared the induced effects with a sedentary control group.

Specific interventions included in the review
Physical exercise (cardiac rehabilitation exercise programmes).

Participants included in the review
Coronary patients, e.g. patients after first myocardial infarction, patients with stable angina, or patients after bypass or valve operation, were included.

Outcomes assessed in the review
Anxiety and depression were assessed.

How were decisions on the relevance of primary studies made?
Studies were included if: they provided treatment for coronary patients; patients were examined before and after the treatment for medical and work capacity; the exercise programme was designed to induce physical training effects; patients were only exposed to exercise treatment; studies combining exercise with other treatments were excluded; anxiety and depression of patients were measured; and they were published in reviewed journals before March 1993.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were combined by a meta-analysis, based on the standardised mean difference.

How were differences between studies investigated?
The authors do not state how differences between the studies were investigated.
Results of the review
Twenty-one studies were included in the review: 15 on depression and 13 on anxiety; 7 studies contained both anxiety and depression outcomes.

The average effect size of exercise programmes was 0.31 (p<0.001) on anxiety and 0.46 (p<0.001) on depression.

The effect sizes were not related to methodological characteristics such as duration of exercise training, time chosen for follow-up, publication year or use of a control group. However, small studies reported significant higher effects than larger ones.

Authors' conclusions
The question of how exercise programmes are extensively used in cardiac prevention and rehabilitation is raised. Conclusions from this meta-analysis must be tempered because of the small number of studies fulfilling all inclusion criteria. Moreover, estimation of effect size can be biased by several factors: overestimation can result, for instance, because (1) correction for unreliability of outcome measures would reduce the average effect size; and (2) it is more likely that non significant results were not published.

Underestimation may occur, for instance, because (1) many of the applied measures of anxiety or depression are more suitable for trait diagnosis rather than for detection of subtle emotional changes; and (2) patients included in the studies differed in the degree of emotional disturbance, so there might be a floor effect for patients without major psychological problems. Unfortunately, the literature on exercise programmes in coronary patients does not provide all the information necessary to rule out potential biases.

Exercise programmes should not be considered the only treatment for emotional disturbances in coronary patients, but they may be used as an additional treatment component.

CRD commentary
The results of this review should be read with caution as the authors have included only published studies from refereed journals, thereby excluding unpublished studies that may contain less positive results. Broader search criteria may have gleaned more studies and thus a larger sample size for the review. There was some indirect evidence of publication bias since larger studies tended to report less effects than smaller studies. The designs of included studies were not of a high standard, and the validity of these studies was not assessed.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.