Psychoeducational rehabilitation for health behavior change in coronary artery disease: a systematic review of controlled trials

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CRD summary
Psychoeducation within cardiac rehabilitation programmes for patients with coronary artery disease had a significant positive effect on physical activity and potentially on dietary habits and smoking but a minimal effect on physiological outcomes. The conclusions reflected the evidence, but methodological limitations, few available studies, small sample sizes and potential language and publication biases mean the conclusions may not be reliable.

Authors' objectives
To assess the effectiveness of psychoeducational interventions incorporated in cardiac rehabilitation programmes on health behaviour change in adults with coronary artery disease and evaluate whether changes in health behaviour impact on physiological risk factors.

Searching
Ten databases (which included MEDLINE, PsycINFO, CINAHL and EMBASE) were searched up to April 2010 for studies in English. The Cochrane Library was searched for relevant systematic reviews for cross checking. Reference lists of identified articles were handsearched. Unpublished studies were excluded. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) and quasi-RCTs that involved adults with a primary diagnosis of coronary artery disease were eligible. All psychoeducational or behavioural interventions delivered by appropriately trained professionals were considered for inclusion. Eligible comparators were standard medical care, cardiac rehabilitation, no intervention and exercise only. Interventions had to last a minimum of four weeks and involve at least one session per week. Behavioural outcomes were smoking cessation, medication use, supplemental oxygen use, exercise habits and nutritional behaviours. Minimum follow-up was six months. Studies were excluded if they compared two or more psychoeducational or behavioural interventions without a control or were of patients with chronic heart failure.

Mean age ranged from 53 to 66 years. Follow-up ranged from six to 60 months. The theoretical approaches of the interventions varied. Interventions incorporated between two and five behaviour change strategies; self-monitoring and self-management were the most common. Most interventions were delivered in groups with or without additional one-to-one sessions. Programme duration was unclear due to discrepancies in reporting. Outcomes were largely collected through self-reported questionnaires.

Studies were selected independently by two reviewers. Disagreements were resolved by a third reviewer as needed.

Assessment of study quality
Included studies were scored out of 10 points using the PEDro assessment scale of randomisation, concealed allocation, baseline similarity, blinding of participants, therapists and assessors, loss to follow-up, intention-to-treat analysis, statistical comparisons and measures of variability.

Quality was assessed independently by two reviewers. Interobserver agreement was assessed using κ statistic.

Data extraction
Primary outcomes were measures of physical activity behaviour (smoking cessation, medication use, supplemental oxygen use, physical activity and nutritional behaviours). Secondary outcomes were physiological outputs (blood pressure, body mass index and cholesterol levels). Data were extracted and used to calculate mean differences for continuous outcomes and risk ratios (RRs) for dichotomous outcomes, with corresponding 95% confidence intervals (CIs).

Data were extracted by one reviewer and checked by a second. Disagreements were resolved via discussion.
Methods of synthesis
Standardised mean differences (SMDs) with 95% CIs were calculated using the inverse variance method. SMDs greater than 0.8 were considered large, those up to 0.2 were considered small and effect sizes between these values were considered moderate. Primary outcomes that were considered sufficiently similar were pooled using a random-effects model. Heterogeneity was assessed using the $I^2$ statistic. Pooling was performed for primary outcomes in cases of low heterogeneity ($I^2<25\%$). Otherwise, a narrative synthesis was conducted. Secondary outcomes were synthesised narratively. Data from interventions with a pharmacological component were omitted.

Results of the review
Four RCTs (included one RCT reported in three papers) and one quasi-RCT with a total of 536 patients were included. Trials had several methodological limitations. Quality scores ranged from 3 to 8 out of 10 (median 5). Only one trial reported adequate concealment methods. Only one study reported blinded outcomes assessment and intention to treat analysis.

Physical activity behaviours (primary outcomes):
Six studies reported data on physical activity. Pooled analysis found that psychoeducational interventions had a positive and moderate effect on levels of physical activity between six and 12 months, which was statistically significant (SMD 0.62, 95% CI 0.30 to 0.94; $I^2=20\%$, four trials, 209 patients).

One trial of 93 patients reported a statistically significant improvement in a self-reported dietary index at two years that was maintained at three years but not at 60 months.

Four studies (three were linked) reported a statistically significant reduction in smoking and one reported no significant effect. One trial of 276 patients reported that chances of abstaining continuously from smoking for a year were 44% higher for participants who received a psychoeducational intervention compared to control (RR 1.44, 95% CI 1.22 to 1.86). Another trial found a significant reduction in smoking rates following psychoeducation compared to control at 12 months (12% reduction versus 9% increase, $p<0.05$) and 36 months but not at 60 months (statistical test used unclear).

Physiological outputs (secondary outcomes):
Three trials found no significant differences in blood pressure during rest and exercise between intervention and control groups. One trial reported a statistically significant 17.4% reduction in mean body fat for psychoeducational programme participants compared to control at six months. Another trial found no effect on body mass index or waist-to-hip ratio.

Authors' conclusions
Psychoeducational interventions as part of cardiac rehabilitation programmes for patients with coronary artery disease had a significant positive effect on levels of physical activity and potentially on dietary habits and smoking. Strategies such as goal setting, self-monitoring, problem solving and role modelling may influence this change. Psychoeducation had a minimal effect on physiological risk factors.

CRD commentary
The review questions and inclusion criteria were clear. Several relevant sources were searched. The restriction to studies published in English risked language and publication biases. Study details were reported. It was unclear which specific comparators and which concomitant interventions were used in each study and this made it difficult to isolate and interpret the effect of psychoeducational components within the broader context of cardiac rehabilitation. Study selection, data extraction and quality assessment were conducted with appropriate attempts to minimise error and bias. Quality assessment showed that most of the included studies had important methodological limitations.

The methods of analysis appeared appropriate, but there was a lack of clarity in reporting some of the statistical methods.

The authors' conclusions reflected the evidence presented, but methodological limitations in the few available studies, small sample sizes and potential for language and publication biases mean that the conclusions may not be reliable.
Implications of the review for practice and research

**Practice:** The authors stated that cardiac rehabilitation programmes should include targeted interventions aimed at developing skills and strategies in addition to risk factor education.

**Research:** The authors stated that further research was needed to identify which specific psychoeducational strategies or combinations were most likely to positively affect risk factors for coronary artery disease.

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