
A meta-analysis of psychoeducational programs for coronary heart disease patients

Dusseldorp E, Van Elderen T, Maes S, Meulman J, Kraaij V

Authors' objectives

To examine the effects of psychoeducational (health education and stress management) programmes for coronary heart disease (CHD) patients.

Searching

A PsycLIT and MEDLINE computer search was performed to locate studies published between 1974 and 1998. Three types of specified keywords were used: patient characteristics, outcomes variables and type of programme. The keywords used were listed. Reference lists from empirical and review studies were screened.

Study selection

Study designs of evaluations included in the review

Studies that included a control condition or comparison condition were included (randomised controlled trials or quasi randomised). Quasi-experiments were included only where samples were stratified or matched pairwise, or when a certain time period was used as the assignment rule for patients from the same hospital. A pre-test measurement was required for risk factors, related behaviours, and psychological variables.

Specific interventions included in the review

The following types of psychoeducational programmes were compared to standard care, exercise training, or health education (HE): stress management (SM); HE; health education, stress management and exercise training; health education and stress management; and health education and exercise training. Interventions were defined as follows: stress management as psychotherapeutic interventions or relaxation training or supportive interventions; health education; as instructional activities organised in a systematic way involving personal contacts between a health professional and coronary heart patients (and partners) to facilitate positive change in risk factors for CHD and related unhealthy behaviours; physical training as actual exercise training (ET); and standard care as information provision which was not organised in any systematic way. Both SM and HE had to include at least one face-to-face session. The average duration of programme was 28 weeks and the average number of sessions was 18. Programme providers included multidisciplinary teams (involving psychologists, psychotherapists or psychiatrists) and unidisciplinary therapists including nurses, psychologists, psychotherapists, psychiatrists, dieticians or a researcher. Interventions could be in in-patient or out-patient settings.

Participants included in the review

Patients who had experienced a cardiac event within 6 months prior to the start of treatment were included. A cardiac event was defined as a myocardial infarction (MI), coronary artery bypass graft (CABG), percutaneous transluminal coronary angioplasty (PTCA), or some combination of these. Mean age of subjects varied between studies from 46 to 59 years and the percentage of female subjects varied from 0% to 34%.

Outcomes assessed in the review

Proximal outcomes included systolic blood-pressure, total cholesterol, weight, smoking, physical training, healthy eating habits, anxiety and depression and distal outcomes included cardiac mortality and cardiac recurrences.

Outcomes were assessed at the following intervals: shorter than one year (short-term); from one through two years (medium-term); and longer than two years (long-term).

The last post-test result for each period was selected. A total measurement period was defined as the period ending the study's final post-test measurement.

Studies reporting effects on emotional distress were only included if effects on risk factors, related behaviours, morbidity or cardiac mortality were also reported.

Success was defined as significant favourable results on all proximal targets measured in the study. When both significant and non significant results were achieved, the study was considered to have partial success and when no significant or unfavourable results were achieved, the study was considered as having failed.

How were decisions on the relevance of primary studies made?

The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality

Validity was not formally assessed though aspects of validity including validity of measurement tool, features of randomisation, study design, and quality of data were coded and discussed. Two independent raters coded study features. Any disagreements were resolved by a third rater.

Data extraction

The following data were extracted and coded by two independent raters: type of intervention; year of publication; study design; country; patient inclusion and exclusion criteria; setting; measurement point; length of programme; profession of programme providers; target of treatment; and five indicators of programme quality (see Other Publications of Related Interest no.1). Computation of effect sizes and outcomes were also coded. Disagreements were resolved by a third rater. When multiple comparisons were reported, only one comparison was selected from each study.

A population effect size was calculated for each outcome variable and expressed as a standardized mean difference (Cohen's *d*) by converting the weighted average effect size (WAES) *r* (see Other Publications of Related Interest no.2). Population effect size with the adjusted post-test effect size was estimated for the dependent variables with a pre-test measurement.

Methods of synthesis

How were the studies combined?

Comprehensive details of the statistical analyses were reported. Only summary details are mentioned here. Pooled mortality and morbidity rates were estimated using the random effects Mantel-Haenszel summary estimate of the odds ratio (OR).

How were differences between studies investigated?

Effect sizes were considered to be homogeneous if the following two conditions were satisfied: the percentage of observed variance accounted for by sampling error was at least 75% and the chi-squared test for heterogeneity was not significant. In cases of heterogeneity moderators were sought where more than five studies were used for the summary estimate. Disjoint cluster analysis was used to identify possible clusters of similar effect sizes. The influence of study features on the effect sizes was also examined. A study feature was considered to be a moderator if its categories identified distinct homogeneous sets of study effect sizes.

Results of the review

Thirty-seven studies were included (9081 participants). Studies included 28 RCTs and 9 quasi randomised studies.

Only some of the many results presented in the review are reported here.

Most studies evaluated the effect of a health education and stress management programme. On average, the pretest measurement occurred four weeks after the cardiac event. The programs varied substantially in duration and number of sessions.

Methodological problems in the primary studies included absence of clear descriptions of intervention programs and program components and poor quality of measurements of risk factors and related behaviours. The distribution of effect sizes for the total measurement period did not suggest a homogeneous set of studies.

Cardiac mortality (10 studies, 4266 patients): Total measurement period ranged from 6 months to 10 years. Population effect size was significant for the long term and for the part/success cluster. Heterogeneity was found. Studies without success on proximal factors were homogeneous and studies with success/partial success on proximal factors were homogeneous.

Total WAES (weighted average effect size) $r = 0.23$ (95% CI: -0.008, -0.053). OR = 1.30.

MI recurrence (16 studies, 7084 patients): Total measurement period ranged from 1 to 10 years. Population effect size was significant at all measurement periods except for short term. Heterogeneity was found. Studies without success on proximal factors were homogeneous and studies with success/partial success on proximal factors with more than 100 patients were homogeneous. Population effect sizes were significant only for the success cluster.

Total WAES $r = 0.032$ (95% CI: 0.008, 0.055). OR = 1.25.

CABG and angina pectoris: estimated population effect size was significant only for the short-term for angina pectoris. Short term WAES r for angina pectoris = 0.036 (95% CI: 0.002, 0.069). OR = 1.16.

Risk factors and psychological variables:

Mean systolic blood pressure (7 studies): For total period and medium term interventions were associated with decreased blood pressure (BP).

Total serum cholesterol (7 studies): at all measurement times rehabilitated patients showed reduced cholesterol. However heterogeneity was found and no moderators were identified.

Weight (8 studies): at all measurement times rehabilitated patients showed reduced weight. Total WAES $r = 0.088$ (95% CI: 0.027, 0.149), $d = 0.18$. No evidence of heterogeneity.

Smoking behaviour (21 studies): at total measurement and for medium term, rehabilitated patients showed an increase in those stopping smoking. At each measurement period studies were heterogeneous.

Physical exercise (8 studies), healthy eating habits (6 studies): the quality of measurement was low and no single indicator could be determined. At all measurement times, heterogeneity was found.

Anxiety (10 studies): all but one used a validated questionnaire.

Depression (13 studies): all but 2 studies used a validated questionnaire.

All sets of study effect sizes were homogeneous. There was no evidence that the interventions reduced anxiety or depression.

Three study features were found to act as moderators: success on proximal targets; quality of data; and year of publication. The following were not found to act as moderators: features of random assignment; program characteristics (type of evaluation, setting, program length, profession of provider, individual or group treatment, participation of partners); and patient characteristics (mean age, type of cardiac event, % women).

Authors' conclusions

The results suggest that psychoeducation programmes yielded a 34% reduction in cardiac mortality, a 29% reduction in the recurrence of MI, and significant positive effects on blood-pressure, cholesterol, body weight, smoking, behaviour, physical exercise, and eating habits. No effects of psychoeducational programmes were found in regard to coronary bypass surgery, anxiety or depression. The results also suggested that cardiac rehabilitation programmes that were successful on proximal targets (systolic blood pressure, smoking behaviour, physical exercise, emotional distress) were more effective on distal targets (cardiac mortality, and MI recurrences) than programmes without success on proximal targets.

CRD commentary

The aims and inclusion criteria were stated. The definitions used to classify interventions were stated. The methods used to extract coded data and prepare data for analysis were described. Statistical heterogeneity was assessed and where heterogeneity was found this was investigated. Relevant details were presented in tabular format. The discussion includes consideration of the following: methodological flaws in the primary studies; explanations for the lack of moderator effects for type of evaluation and target of treatment; potential overestimate of results of the review due to publication bias; and reasons for not considering results for randomised trials separately.

Only two databases were searched and no attempt was made to locate unpublished data thus raising the possibility of publication bias. It was not stated whether any language restrictions were applied to the included studies. Methods used to select primary studies were not described. Validity was not formally assessed, though aspects of validity were considered. As the authors state, results from the review are limited by the lack of evidence of specific components of effective interventions.

Results should be interpreted with caution in view of the finding of heterogeneity for the analyses of cardiac mortality, myocardial infarction recurrence, cholesterol, smoking behaviour and physical exercise and the lack of incorporation of results from a formal validity assessment in the analyses.

Implications of the review for practice and research

Practice: The authors state that the development of psychoeducational programmes in cardiac rehabilitation should be stimulated and that risk factor modification and reduction of emotional distress should be targeted in coronary heart disease patients to decrease their chances of a fatal or non fatal recurrence of MI.

Research: The authors state that the development of psychoeducational programmes has to be based on theory-driven research focusing on the relationship between specific components of interventions and changes in proximal and distal targets related directly to the needs of the individual patient.

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Bibliographic details

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Other publications of related interest

1. Mullen PD, Mains DA, Velez R. A meta-analysis of controlled trials of cardiac patient education. *Patient Education and Counselling* 1992;19:143-62. 2. Rosenthal R. Parametric measures of effect size. In: Cooper HM, Hedges LV, editors. *The handbook of research synthesis*. New York: Russell Sage Foundation; 1994. p. 231-44.

These additional published commentaries may also be of interest. Gluckman R. Review: psychoeducational programmes reduce MI recurrence and improve some physical health outcomes. *Evid Based Med* 2000;5:83. Benson G. Review: psychoeducational programmes reduce long term mortality and recurrence of myocardial infarction in cardiac patients. *Evid Based Nurs* 2000;3:80.

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