Psychological interventions for coronary heart disease (Review)

Whalley B, Rees K, Davies P, Bennett P, Ebrahim S, Liu Z, West R, Moxham T, Thompson DR, Taylor RS

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2011, Issue 8

http://www.thecochranelibrary.com

TABLE OF CONTENTS

[Intervention Review]

Psychological interventions for coronary heart disease

Ben Whalley[2], Karen Rees[3], Philippa Davies[4], Paul Bennett[5], Shah Ebrahim[6], Zulian Liu[7], Robert West[8], Tiffany Moxham[9], David R Thompson[10], Rod S Taylor[1]

[1]Peninsula College of Medicine and Dentistry, Universities of Exeter & Plymouth, Exeter, UK. [2]Centre for Multilevel Modelling, Graduate School of Education, University of Bristol, Bristol, UK. [3]Health Sciences Research Institute, Warwick Medical School, University of Warwick, Coventry, UK. [4]Academic Unit of Psychiatry, School of Social and Community Medicine, University of Bristol, Bristol, UK. [5]Cardiff School of Nursing and Midwifery Studies, University of Cardiff, Cardiff, UK. [6]Department of Non-communicable Disease Epidemiology, London School of Hygiene and Tropical Medicine, London, UK. [7]PenTAG, Peninsula Medical School, University of Exeter, Exeter, UK. [8]Wales Heart Research Institute, Cardiff, UK. [9]Wimberly Library, Florida Atlantic University, Boca Raton, Florida, USA. [10]Cardiovascular Research Centre (CvRC), Australian Catholic University, Melbourne, Australia

Contact address: Rod S Taylor, Peninsula College of Medicine and Dentistry, Universities of Exeter & Plymouth, Veysey Building, Salmon Pool Lane, Exeter, EX2 4SG, UK. rod.taylor@pms.ac.uk.

Editorial group: Cochrane Heart Group.
Publication status and date: New search for studies and content updated (no change to conclusions), published in Issue 8, 2011.
Review content assessed as up-to-date: 30 July 2009.

Citation: Whalley B, Rees K, Davies P, Bennett P, Ebrahim S, Liu Z, West R, Moxham T, Thompson DR, Taylor RS. Psychological interventions for coronary heart disease. *Cochrane Database of Systematic Reviews* 2011, Issue 8. Art. No.: CD002902. DOI: 10.1002/14651858.CD002902.pub3.

ABSTRACT

Background

Psychological symptoms are strongly associated with coronary heart disease (CHD), and many psychological treatments are offered following cardiac events or procedures.

Objectives

Update the existing Cochrane review to (1) determine the independent effects of psychological interventions in patients with CHD (principal outcome measures included total or cardiac-related mortality, cardiac morbidity, depression, and anxiety) and (2) explore study-level predictors of the impact of these interventions.

Search methods

The original review searched Cochrane Controleed Trials Register (CCTR, Issue 4, 2001), MEDLINE, EMBASE, PsycINFO, and CINAHL to December 2001. This was updated by searching the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE, PsycINFO and CINAHL from 2001 to January 2009. In addition, we searched reference lists of papers, and expert advice was sought for the original and update review.

Selection criteria

Randomised controlled trials of psychological interventions compared to usual care, administered by trained staff. Only studies estimating the independent effect of the psychological component with a minimum follow-up of six months. Adults with specific diagnosis of CHD.

Data collection and analysis

Titles and abstracts of all references screened for eligibility by two reviewers independently; data extracted by the lead author and checked by a second reviewer. Authors contacted where possible to obtain missing information.

Main results

There was no strong evidence that psychological intervention reduced total deaths, risk of revascularisation, or non-fatal infarction. Amongst a smaller group of studies reporting cardiac mortality there was a modest positive effect of psychological intervention (relative risk: 0.80 (95% CI 0.64 to 1.00)). Furthermore, psychological intervention did result in small/moderate improvements in depression, standardised mean difference (SMD): -0.21 (95% CI -0.35, -0.08) and anxiety, SMD: -0.25 (95% CI -0.48 to -0.03). Results for mortality indicated some evidence of small-study bias, though results for other outcomes did not. Meta regression analyses revealed four significant predictors of intervention effects on depression were found: (1) an aim to treat type-A behaviours (ß = -0.32, p = 0.03) were more effective than other interventions. In contrast, interventions which (2) aimed to educate patients about cardiac risk factors (ß = 0.23, p = 0.03), (3) included client-led discussion and emotional support as core therapeutic components (ß = 0.31, p < 0.01), or (4) included family members in the treatment process (ß = 0.26, p < 0.01) were significantly less effective.

Authors' conclusions

Psychological treatments appear effective in treating psychological symptoms of CHD patients. Uncertainly remains regarding the subgroups of patients who would benefit most from treatment and the characteristics of successful interventions.

PLAIN LANGUAGE SUMMARY

Psychological interventions for coronary heart disease

Heart attacks and cardiac surgery may be frightening and traumatic, and can lead some patients to experience psychological problems. In addition, some psychological characteristics are linked to the development and progression of cardiac complaints. Psychological treatments for depression, anxiety, stress or maladaptive behaviours are sometimes offered to patients, either individually or as part of a comprehensive package of cardiac rehabilitation. This review examined studies where the effect of these psychological interventions could be distinguished from other components of rehabilitative treatment (e.g. exercise). We found evidence that psychological interventions may produce small to moderate reductions in depression and anxiety, and may also reduce cardiac mortality, but did not find evidence that they reduced the rate of heart attack or need for cardiac surgery, or total mortality.

BACKGROUND

Coronary heart disease (CHD) is the single leading cause of death for both men and women in industrialised countries (BHF 2009), and cardiac events or cardiac surgery can be significant and distressing life events. Furthermore, although depression, anxiety, and other deficits of emotional regulation are difficult to identify and treat in older patients who are medically ill (Cohen-Cole 1993), psychopathology constitutes an independent risk factor for cardiac morbidity (Halaris 2009). As a consequence, the need to address stress, psychosocial factors (including lack of social support), and other psychopathology, is often recognized within conventional cardiac care (Lesperance 2000).

Cardiac rehabilitation is offered to individuals after cardiac events to aid recovery and prevent further cardiac illness (Lesperance 2000). As part of their rehabilitation, patients may be offered interventions which specifically aim to influence psychological or psychosocial outcomes. These psychological or psychosocial interventions are varied and may range from organisational efforts to improve patient communication and support (e.g. Jolly 1998) to empirically supported psychotherapies used to target diagnosed psychopathology in cardiac patients (e.g. Black 1998). Furthermore psychological/psychosocial interventions may incorporate other elements of cardiac rehabilitation such as diet and lifestyle advice, or exercise;in some cases the intervention may be described as 'psychological' only to the extent that psychological techniques are used to further other treatment goals.

Original Cochrane review

The original Cochrane review of psychological interventions for CHD undertaken by Rees 2004 found a marked variation in the nature of interventions across studies, and in relation reported substantial statistical heterogeneity in effects for a number of outcomes. Meta-analysis of all studies showed no strong evidence of an effect on total or cardiac mortality, or revascularisation al-

though there was a significant reduction in the number of non-fatal infarctions in the intervention group (odds ratio: 0.78 (95% CI 0.67 to 0.90). A subgroup analysis of interventions categorised as 'stress management' produced similar results. However, as Rees 2004 noted, restricting subgroup analyses to 'stress management' interventions may not be justified - although stress is one factor associated with CHD, depression and anxiety also constitute risk factors. Consequently, a broader range of psychological interventions, and not just stress management interventions, may be helpful in reducing cardiovascular events.

Additionally, in some of the trials included in the original review the intervention group received both psychological/psychosocial interventions alongside other components of cardiac rehabilitation (for example exercise or enhanced medical care), that were not available to control patients (e.g. DeBusk 1994b, Erdman 1983, Fridlund 1991). Thus, from the previous data-set it was not possible to establish the independent effect of psychological techniques for this patient group.

Changes in this update review

In addition to updating the original Cochrane review, this update review has: restricted inclusion to studies in which (1) it was stated that staff delivering the psychological intervention had received training in psychological intervention, and (2) that compared the effect of psychological therapy separately from the effects of other non-psychological interventions, particularly exercise training. It has also: (3) introduced a system of classification for psychological interventions based on the aims and components of each treatment; and (4) formally explored the heterogeneity and variation in psychological intervention effects using meta-regression. Finally, (5) the updated review did not consider modifiable cardiac risk outcomes (e.g. serum lipids, blood pressure, or smoking prevalence).

OBJECTIVES

1. To determine the independent effects of psychological interventions in patients with CHD. Principal outcome measures included total or cardiac-related mortality, cardiac morbidity, depression, and anxiety.

2. To explore study-level predictors of the impact of these interventions.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials with parallel group design.

Types of participants

Adults of all ages with CHD. Patients included those who had experienced a myocardial infarction (MI), a revascularisation procedure (coronary artery bypass grafting (CABG) or percutaneous transluminal coronary angioplasty (PTCA)), and those with angina, or angiographically defined CHD.

Types of interventions

All psychological interventions delivered by health care workers with specific training in psychological techniques were considered. Criteria for specific training were liberal (i.e. included even very short periods of training), but excluded interventions delivered by social workers or cardiac nursing staff unless specific mention was made of training in delivering psychological interventions. In addition, studies were excluded where they evaluated interventions based on psychological principles (e.g. social learning theory, motivational interviewing) but which were solely directed at improving adherence to other efficacious treatments (e.g. cardiac medications, exercise).

Trials were only considered where the effect of the psychological intervention could be evaluated independently. Thus, studies were included that compared psychological treatment with usual care, or compared psychological treatment plus exercise with an exercise-only condition. Studies where control participants received only a subset of the non-psychological interventions (e.g. lifestyle information sessions, but not exercise) were excluded. The only exception to this criteria was for studies where psycho-pharmacological interventions were solely or disproportionately available to the treatment group (e.g. Black 1998; ENRICHD 2000). This exception was made because psychological treatments are commonly offered in conjunction with psycho-pharmacological treatments, and may be more effective in combination than alone (Butler 2006). Trials were only considered where the follow-up was six months or more following the start of the intervention.

Classification of interventions

The previous version of this Cochrane review classified trials according to whether they reported using 'stress management procedures'. Stress management was defined as the use of specific cognitive behavioural strategies used to help the patient reduce, or manage, their stress. These included learning relaxation, the use of cognitive techniques such as self-instruction training (Meichenbaum 1985) and cognitive challenge (e.g. Beck 1997), and/or consideration of specific coping strategies to be used at times of stress. Less specific approaches such as therapeutic counselling that did not concentrate on behavior change, cognitive challenge/restructuring

(Allison 2000), or educational interventions such as Frasure-Smith 1985, were excluded from this definition - in this case, the authors reported that "very little treatment of a traditional psychotherapeutic nature was provided, even at the basic level of listening and helping patients express their emotions". Also excluded were self-management techniques used to change risk factors such as smoking and low levels of exercise. The cognitive behavioural treatment of other aversive mood states including anger and depression was also excluded.

To facilitate a more detailed examination of the types of intervention, the classification was expanded for this update. Specifically, we extracted information on the treatment aims of each intervention (e.g. provision of risk information, treatment of psychopathology such as depression or anxiety), and the components of the treatment (e.g. providing standardised health information, relaxation techniques, cognitive challenge). Details are provided below (Data collection and analysis).

Extraction of additional study characteristics

Information on other study characteristics was extracted for all trials included in the review, including those carried forward from the previous review. Variables include the proportion of male participants, mean sample age, and whether the sample included patients with diagnosed psychopathology.

Extraction of additional time-points from previously-included papers

The previous review extracted only outcomes at the final follow-up, irrespective of whether data were available for multiple time-points six months after randomisation. For new studies, relevant outcomes were extracted for all available time points at least six months after randomisation; for previously-included studies, outcomes for additional time-points were extracted where available.

Types of outcome measures

Primary outcomes

- All-cause and cardiac-related mortality
- Non-fatal MI, Revascularisation (CABG and PTCA)
- Anxiety, Depression, measures of stress and Type A behaviour/hostility

Secondary outcomes

- Health-related quality of life (HRQoL)

Search methods for identification of studies

Randomised controlled trials were identified from the previously published Cochrane review (Rees 2004). This searched the following databases: The Cochrane Controlled Trials Register (CCTR, Issue 4, 2001) using the search strategy in Appendix 1. This was updated by searching MEDLINE 1999 to the end of 2001 on Ovid using a standard RCT filter (Dickersin 1994) and EMBASE 1998 to the end of 2001 using an EMBASE RCT filter (Lefebvre 1996). PsycINFO and CINAHL were also searched from the earliest date available to December 2001. In addition, searches of reference lists of papers were made and expert advice was sought. No language restrictions were applied.

This search was updated by searching the Cochrane Central Register of Controlled Trials (CENTRAL) in *The Cochrane Library* (Issue 4, 2008), MEDLINE (2001 to January 2009), EMBASE (2001 to January 2009), CINAHL (2001 to January 2009), and PsycINFO (2001 to January 2009). Health Technology Assessment (HTA) and Database of Abstracts of Reviews of Effects (DARE) databases were searched via the NHS Centre for Reviews and Dissemination (CRD) web site (2001 to January 2009). Conference proceedings were searched on Web of Science: ISI Proceedings (2001 to January 2009).

Searches were limited to randomised controlled trials and a filter to limit by humans was applied. No language or other limitations were imposed. Consideration was given to variations in terms used and spellings of terms in different countries so that studies were not missed by the search strategy because of such variations. Search strategies were designed with reference to those of the previous systematic review. See Appendix 2 for details of strategies.

Data collection and analysis

Identification of studies

The titles and abstracts of the citations identified from the searches were examined by two reviewers independently (RT and BW or PD), and full copies of potentially relevant references were retrieved. Selected references were then independently reviewed for inclusion by RT and BW or PD. In all cases disagreements about study inclusions have been resolved with consensus among the authors. Studies included in the previous review were re-considered for inclusion based on the slightly narrower inclusion criteria adopted for this update review. After studies identified by the updated searches had been formally included in the review, data were abstracted by BW, PD or ZL, and cross-checked. Disagreements were resolved through discussion. As noted above, additional data for outcomes at intermediary time points were also extracted for studies included in the previous review; this was performed by ZL and cross-checked by BW.

Additional study characteristics

Because of the substantial clinical heterogeneity identified in the previous review, and the evidence of heterogeneity in outcomes for depression and anxiety, additional information regarding the interventions and the characteristics of patient populations was extracted from the descriptions of study methods. We were also guided by recent meta analyses (Linden 2007), which found that the duration of the period between a clinical diagnosis or event and the start of treatment predicted study-level variance in outcomes. Additional study characteristics were extracted by BW, and cross-checked by ZL.

Characteristics of the interventions

In an additional exploratory analysis, the first author classified interventions according to simple taxonomy of therapeutic approaches. This classification attempted to identify (A) the goals of the treatment (e.g. if the treatment aimed to treat depression, anxiety, type-A behaviours including anger or hostility, exhaustion, stress, or if it attempted to encourage behavioural change, or improve awareness of cardiac risk factors) and (B) the components used to achieve these goals (e.g. provision of risk information, guidance on behaviour change, self-awareness or self-monitoring techniques, relaxation techniques, cognitive challenge or restructuring techniques, client led discussion or social support, and homework). Scores were assigned as follows: (1) the aim or component was central to the treatment as described in the study method; (0.5) the aim or component was peripheral or strongly implied by the text of the study method; (0) not part of the treatment as described. The availability of cardiac rehabilitation (CR) for control and intervention patients was also recorded.

Risk of bias assessments

For all studies, including those in the previous review, standard risk of bias assessments using the Cochrane Collaboration's risk of bias assessment tool were conducted (Higgins 2011). Because of the nature of the interventions studied, assessing the blinding of treatment assignment was not appropriate; in our risk of bias table we instead reported on the blinding of outcome assessments.

Handling of dichotomous and continuous outcome data

Dichotomous outcomes for each study have been expressed as risk ratios (RR) with associated 95% confidence intervals (CI), and study sample sizes based on the number randomised to treatment conditions. Continuous variables have been expressed as the mean change from baseline to follow-up, and the standard deviation difference from baseline to follow-up, for each comparison group (sample sizes based on N completing assessments at each time point). Where standard deviations for differences have not been reported in the source papers, allowance has been made for within-patient correlation from baseline to follow-up measurements by using an assumed correlation (Cochrane Heart Group 2003; Follmann 1992). For a base-case analysis, a correlation of 0.7 was assumed for both depression and anxiety measures. Published test-retest correlation coefficients for the outcome measures included in this study range widely (e.g. from 0.6 to 0.8 for Beck 1961 in non-psychiatric samples), and depend to a large degree on the duration of the test period (Hersen 2004). For each of the outcome measures, a sensitivity analysis was performed assuming correlations of 0.5 (used in the previous version of this review), and also at 0.8; these are only reported where the assumed correlation changes the inference of the analysis.

For each study, a standardised mean difference (SMD) between treatment and control conditions (and 95% CI) was calculated, and data were pooled using random effects models because of the substantial clinical heterogeneity in treatments. For outcomes where there was insufficient data, or where it was inappropriate to combine studies statistically, a qualitative overview is presented. We investigated the possibility of small study bias for each of the outcomes included in meta-analyses visually (using funnel plots) and statistically (Egger 1997).

RESULTS

Description of studies

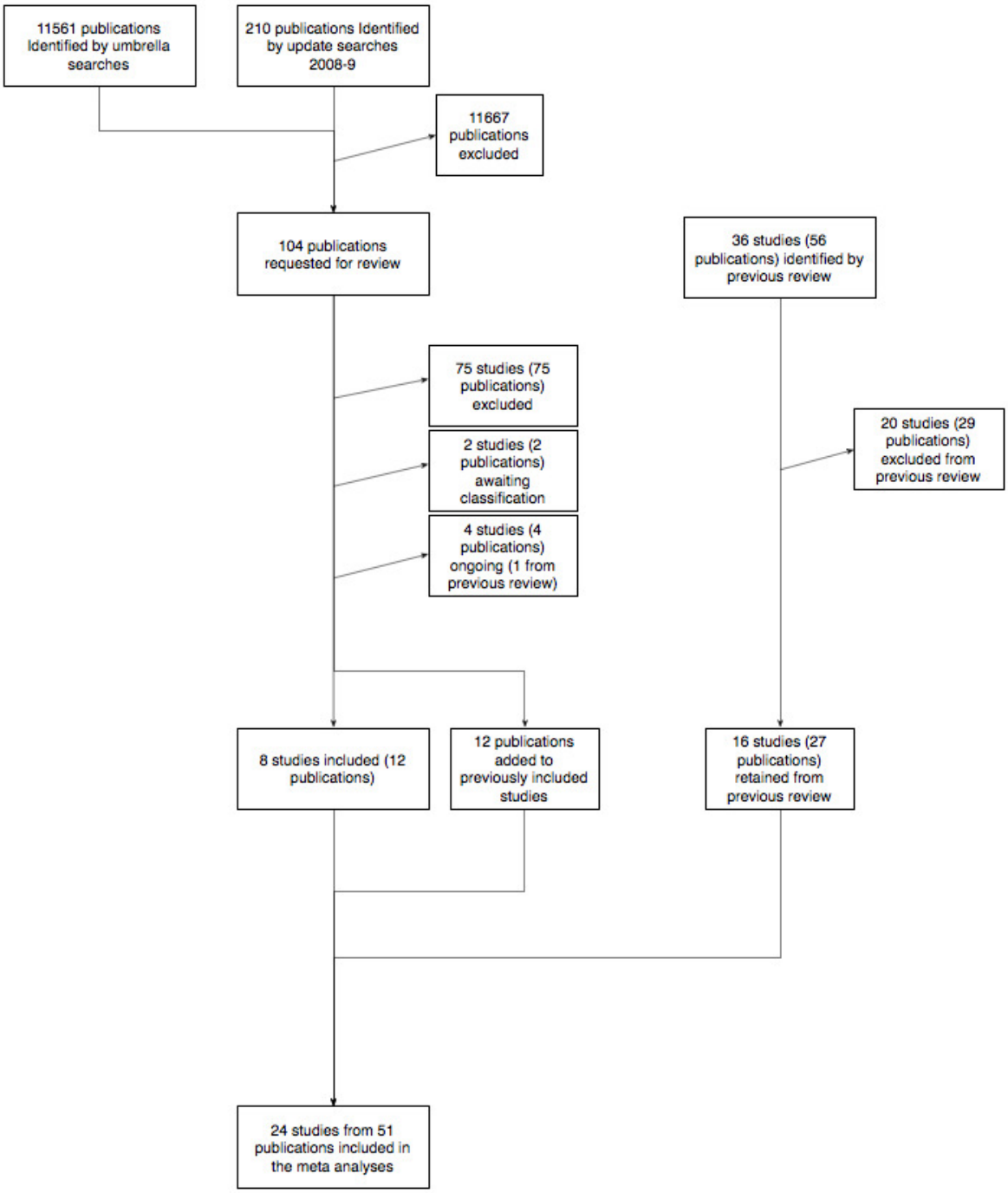
See: Characteristics of included studies; Characteristics of excluded studies; Characteristics of studies awaiting classification; Characteristics of ongoing studies.

Searches for the original version of this Cochrane review, up to 2001, identified 6535 titles and abstracts. Of these, 331 went forward for full paper review, and 36 met the inclusion criteria (Characteristics of included studies, Characteristics of excluded studies). Sixteen of these 36 studies (27 publications) in the original Cochrane review were found to meet the criteria for this update of the review (Black 1998; Brown 1993; Burell 1996a; Burgess 1987; Cowan 2001; Elderen 1994; ENRICHD 2000; Gallacher 1997; HofmanBang 1999; Ibrahim 1974; Jones 1996; Oldenburg 1985; Rahe 1979; RCCP 1982; Stern 1983; Van Dixhoorn 1999), but 20 studies (29 publications) failed to meet the updated criteria. Of the studies which were included in the original Cochrane review but failed to meet the new criteria, six failed to state that interventionists had received training in psychological intervention techniques (Allison 2000; Frasure-Smith 1985; Johnston 1999; McHugh 2001; Nordmann 2001; Thompson 1989), and 12 included exercise or enhanced medical care in addition to psychological interventions (DeBusk 1994a; Erdman 1983; Frasure-Smith 1997; Fridlund 1991; Gutschker 1982; Lewin 2002; Lidell 1996; Oldenburg; Oldridge 1995; Ornish 1990; PRECOR Group 1991;

Toobert 1998; Vermeulen 1983). One study was an organisational intervention (Jolly 1998) and did not deliver psychological treatment directly to patients, and Mitsibounas 1992 provided no outcomes meeting our inclusion criteria. The majority of included studies were conducted in the USA and Europe.

For the searches between 2001 and 2009, 11,771 titles and abstracts were found, from which 104 papers were selected for review. Of these, eight studies (12 publications) met the inclusion criteria (Appels 2005; Claesson 2005; Koertge 2008; Mayou 2002; McLaughlin 2005; Michalsen 2005; Peng 2005; Sebregts 2005). Of the 75 studies (75 publications) excluded from the new searches, 22 failed to meet our definition of a psychological intervention or were not delivered by trained personnel, six were not conducted with a suitable patient group, 28 had follow-up shorter than six months, 12 did not report results from RCTs, seven had no suitable outcomes for this review. The list of excluded studies and reasons for exclusion are provided (Characteristics of excluded studies). Peng 2005 was included in the review despite some of the patient sample not meeting our criteria for angiographically defined CHD; these patients were in-patients who presented with MI, angina, arrhythmias and heart failure. Our decision to include (with sensitivity analyses presented below) is based on the otherwise complete bias towards studies performed in Europe and North America (primarily the UK and USA), and thus increase generalisability of our findings. Thus, a total of 24 studies (51 publications) were included, reporting data from a total of 9296 patients (Figure 1). Two studies (two publications) (James 2006; Zetta 2006) are awaiting further information for classification, and four studies (four publications) (Beckie 2006; Burg 2007; CORE; Frasure 2006) are ongoing.

Figure 1. QUORUM figure for searches and study inclusions.



Characteristics of included trials

The mean age of participants recruited by the 24 included studies was 56.4 years (SD = 3.5), and 74% of these participants were male. Eighty percent of participants had been referred to treatment because of an MI, and 39% had undergone some form of revascularisation (e.g. CABG, PTCA). On average, treatment began within 5.8 weeks of the cardiac event (or diagnosis) although there was some variation in treatment onset (range 0 - 34 weeks, SD 7.5 weeks). The majority of included trials (20 of 24) studied CHD patients with no identified levels of psychopathology prior to randomisation. However, four trials did use psychopathology as an inclusion criteria (Black 1998; ENRICHD 2000; McLaughlin 2005; Stern 1983). In these cases thresholds were derived from the Global Severity Index of the Symptom Checklist 90 revised (greater than 63 for Black 1998), the Taylor Manifest Anxiety Scale and Zung Depression Scale (greater than 19 and 40 respectively - McLaughlin 2005; Stern 1983), and the Hamilton Rating Scale for Depression (ENRICHD 2000; HAM-D 1988; McLaughlin 2005). Note, ENRICHD 2000 also used a set of diagnostic criteria based on the DSM-IV). In an additional four studies, baseline evaluations of patients indicated that some of the patient groups experienced clinically significant levels of psychopathology (Appels 2005; Jones 1996; Mayou 2002; Sebregts 2005). The remaining studies did not indicate whether any proportion of patients met a clinical threshold for psychopathology. For continuous outcomes, many studies suffered from relatively high levels of missing data at follow-up (e.g. 31% missing at follow up for Koertge 2008 depression, 27% missing at follow-up for HofmanBang 1999 anxiety). Overall, 16% of responses for depression outcomes and 10% of responses for anxiety outcomes were missing at the follow-up point included in our pooled analyses. Additionally, missing data were slightly more common in control than in treatment conditions (20% versus 18%), and this difference was quite marked in some studies (e.g. for depression outcomes, 10% more missing data in control condition for McLaughlin 2005, 9% for Koertge 2008, 5% for ENRICHD 2000).

Characteristics of included interventions

The amount of time patients spent in contact with interventionists was only adequately reported for 19 studies, but there was substantial variability in intensity of treatments offered. The mean number of hours spent in treatment was 26.1, (min 2.4, max 96, SD = 26.8). The majority of the interventions were based on group therapy sessions (13/19 trials) or comprised a mix of group and individual session (7); only four trials used treatments that were delivered only on an individual basis. For eight of the 24 studies, it was explicitly stated that patients' families were included in treatment, and for four studies family were explicitly not included.

For 22 studies, sufficient information was available to perform an exploratory categorisation of treatment aims and components. Common aims of treatments were reductions in stress (16 treatments), anxiety (15), depression (12), type-A behaviour including anger and hostility (10) and improved disease adjustment (10). Two treatments aimed to reduce vital exhaustion. In addition, 13 treatments aimed to improve awareness of cardiac risk factors, and nine attempted to effect changes in behaviours related to cardiac risks (e.g. smoking, salt intake). Common components of treatment included relaxation exercises (16 studies), self-awareness and self-monitoring (16), risk education (13), emotional support or client-led discussion (11), homework exercises (11), guidance on successful behaviour change (9), and cognitive challenge or cognitive restructuring techniques (9).

Risk of bias in included studies

For the majority of studies both the method of random number-sequence generation (17 of 24), and method of allocation concealment (17 of 24) were unclear. Several studies used block randomisation where the unit of randomisation was, for example, the ward of a hospital, to prevent contamination between the intervention and control groups. For several studies, the method of quasi-randomisation was used, e.g. allocation based on days of the week, or date of admission (Ibrahim 1974; Oldenburg 1985). Only five of 24 studies reported that outcome assessors were blind to group allocation (Figure 2, Figure 3). Most studies reported ITT analyses (exceptions were Peng 2005; Rahe 1979). For 13 of the 24 studies, outcome data were either complete or missing data adequately accounted for; for three studies missing data were not properly accounted for, and in the remaining eight studies it was unclear whether missing data were properly handled. For the large majority of studies (18 of 24) insufficient information was provided to evaluate the blinding of assessors; only five studies explicitly reported that assessors were blinded to group assignment.

Figure 2. Methodological quality graph: review authors' judgements about each methodological quality item presented as percentages across all included studies.

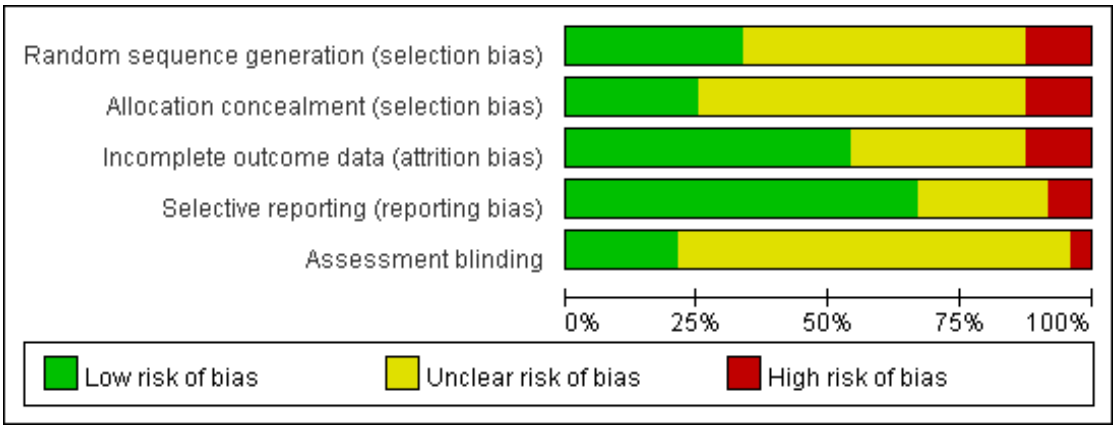
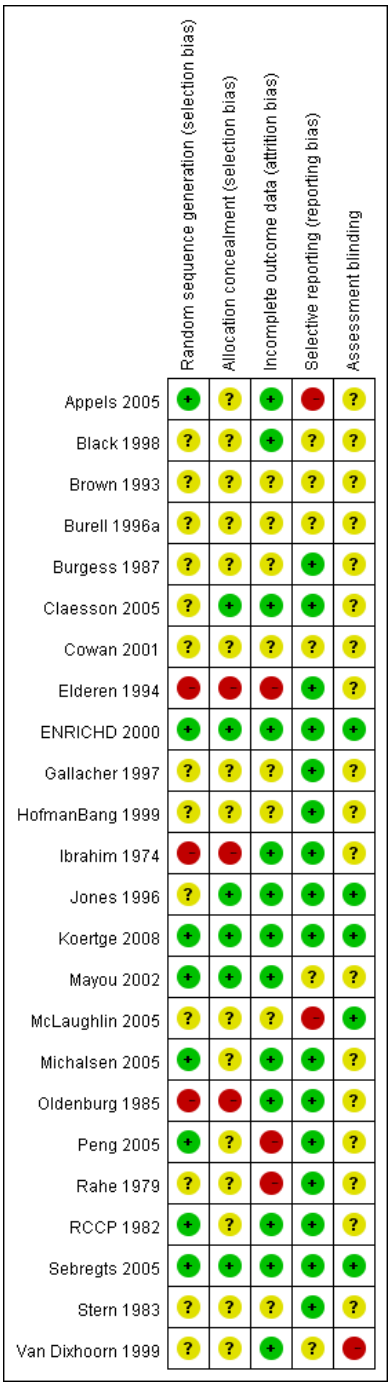


Figure 3. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.



Effects of interventions

Analyses were stratified by time of follow up (< 13 months, 13 to 24 months, and > 24 months) for each of the outcomes, but in no cases did this change the inference of the analysis. Additionally, in the univariate meta-regression analyses (reported in Table 1) duration of follow up was not a significant predictor of variation in outcomes for total mortality or depression. Therefore, only results from analyses using the last follow-up point from each study are reported here.

Clinical events

Seventeen trials reported all cause mortality (Analysis 1.1), and five trials reported cardiac mortality (Analysis 1.2). There was no evidence of a statistically significant effect of the interventions on all-cause mortality, relative risk (RR) 0.89 (95% CI 0.75 to 1.05; 6852 patients, heterogeneity: Chi^2 (14) = 14.29, P = 0.43, I^2 = 2%). However, for cardiac mortality there was some evidence of fewer deaths in the intervention group, RR 0.80 (95% CI 0.64 to 1.00; 3893 patients, heterogeneity: Chi^2 (4) = 2.98, P = 0.56, I^2 = 0%). Twelve studies reported the rates of revascularisation (Analysis 1.3) and twelve studies reported rates of (non-fatal) re-infarction (Analysis 1.4). Interventions showed no significant effects on occurrence of revascularisation, RR 0.95 (95% CI 0.80 to 1.13; 6670 patients, heterogeneity: Chi^2 (11) = 12.61, P = 0.32, I^2 = 13%), or non-fatal MI, RR 0.87 (95% CI 0.67 to 1.13; 7535 patients, heterogeneity: Chi^2 (10) = 14.53, P = 0.15, I^2 = 31%).

Psychological outcomes

Depression was reported in 12 trials (Analysis 1.5; 5041 patients) and for anxiety in eight trials (Analysis 1.6; 2771 patients). A significant reduction in depression was found with treatment, SMD: -0.21 (-0.35, -0.08) (heterogeneity: Chi^2 (11) = 36.36, df = 11 , P = 0.0001, I^2 = 70%), and a similar result was found for anxiety, SMD: -0.25 (-0.48, -0.03) (heterogeneity; Chi^2 (7) = 24.57, P = 0.0009; I^2 = 72%). Inferences for depression were unchanged by the exclusion of Peng 2005, but inferences for anxiety did change: SMD without this study was -0.16 (-0.34, 0.02).

Small study bias

The funnel plot for total mortality showed some evidence of asymmetry, and therefore of small study bias; however, this failed to achieve statistical significance (Egger test P = 0.068). We found no evidence of funnel plot asymmetry for any of the other outcomes (Egger test: cardiac mortality: P = 0.64, revascularisation: P = 0.67, non-fatal MI: P = 0.82, depression: P = 0.44, anxiety: P = 0.11 (Figure 4; Figure 5; Figure 6; Figure 7; Figure 8; Figure 9).

Figure 4. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.1 Total Mortality.

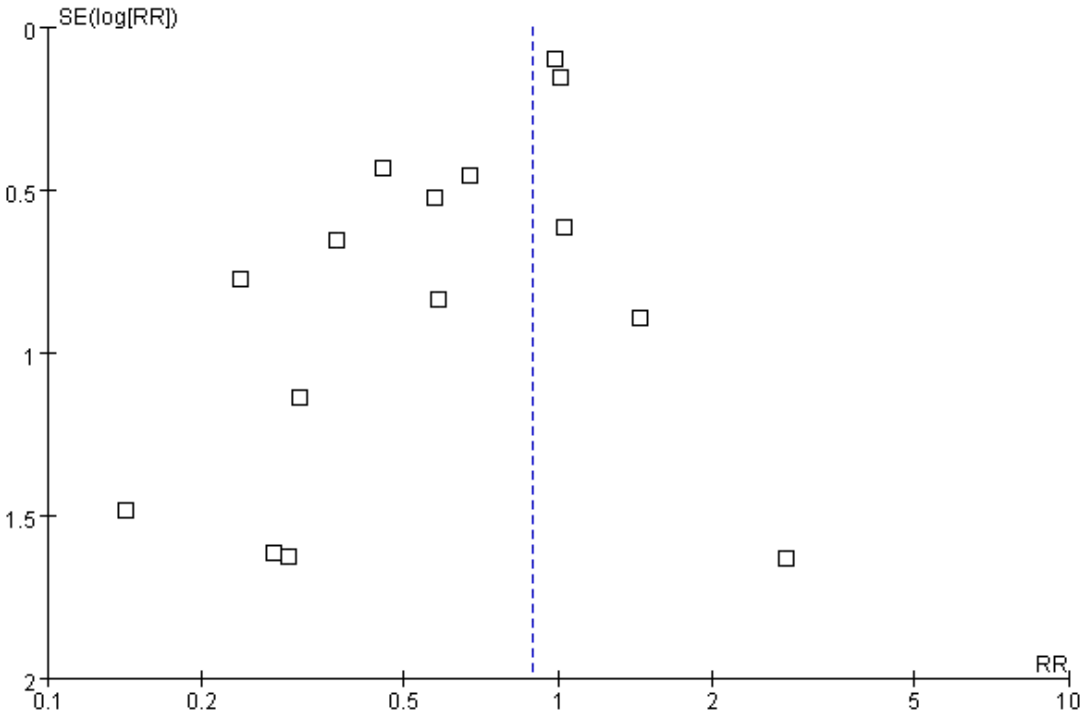


Figure 5. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.5 Depression.

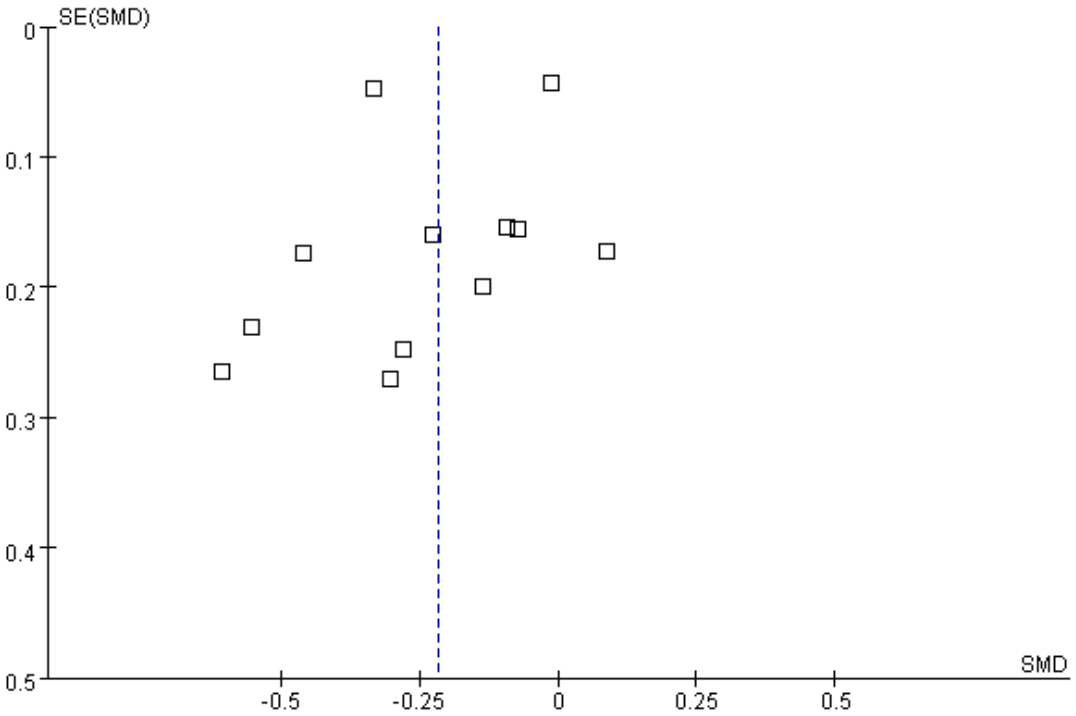


Figure 6. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.2 Cardiac Mortality.

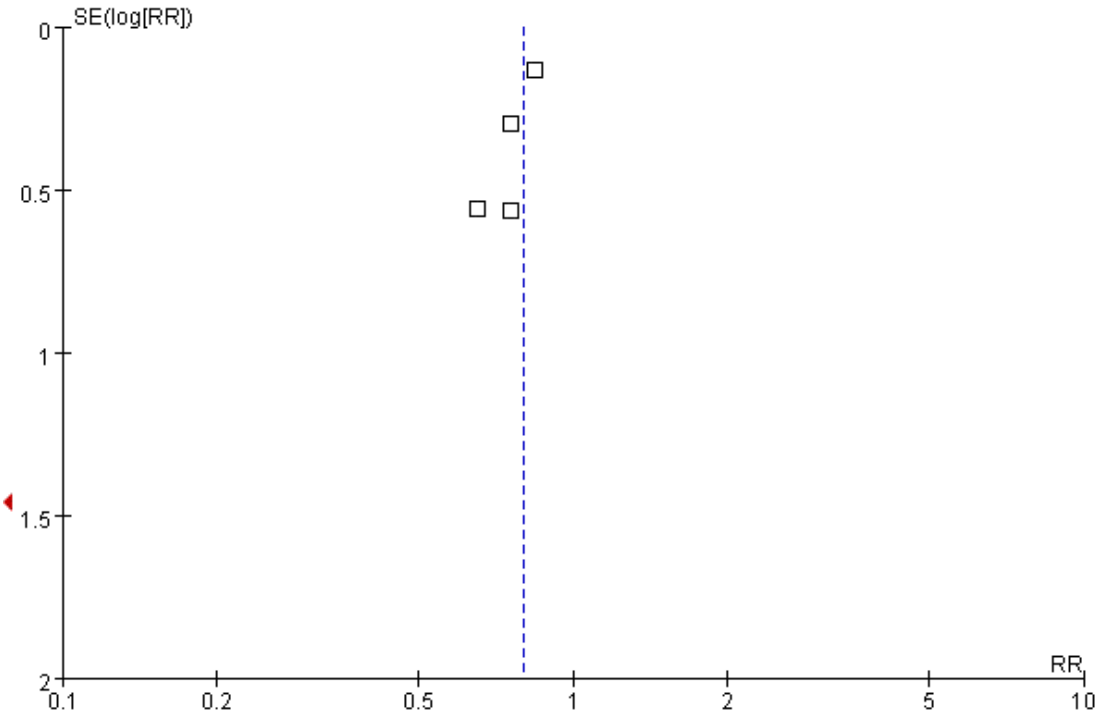


Figure 7. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.3 Revascularisation (CABG and PTCA combined).

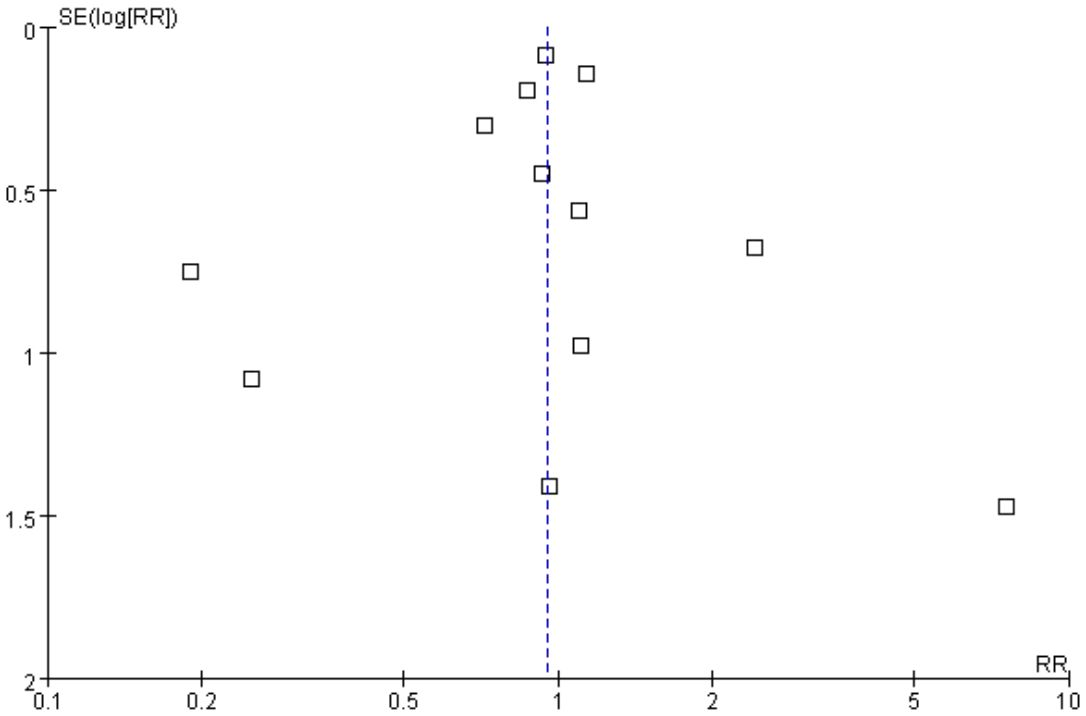


Figure 8. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.4 Non-fatal MI.

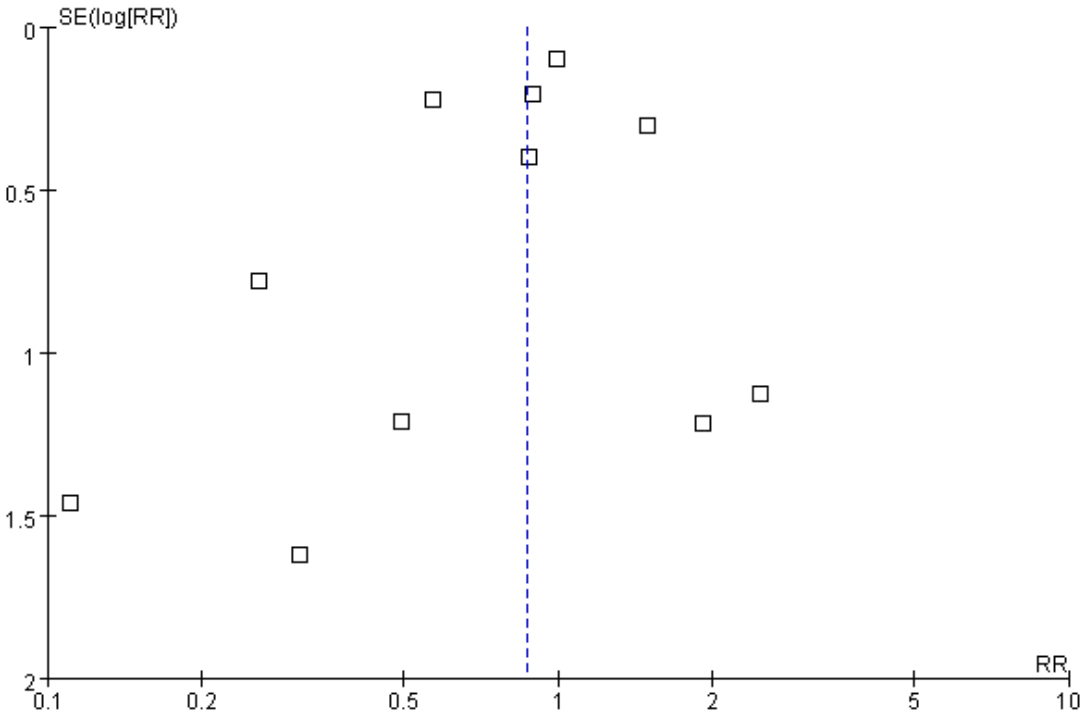
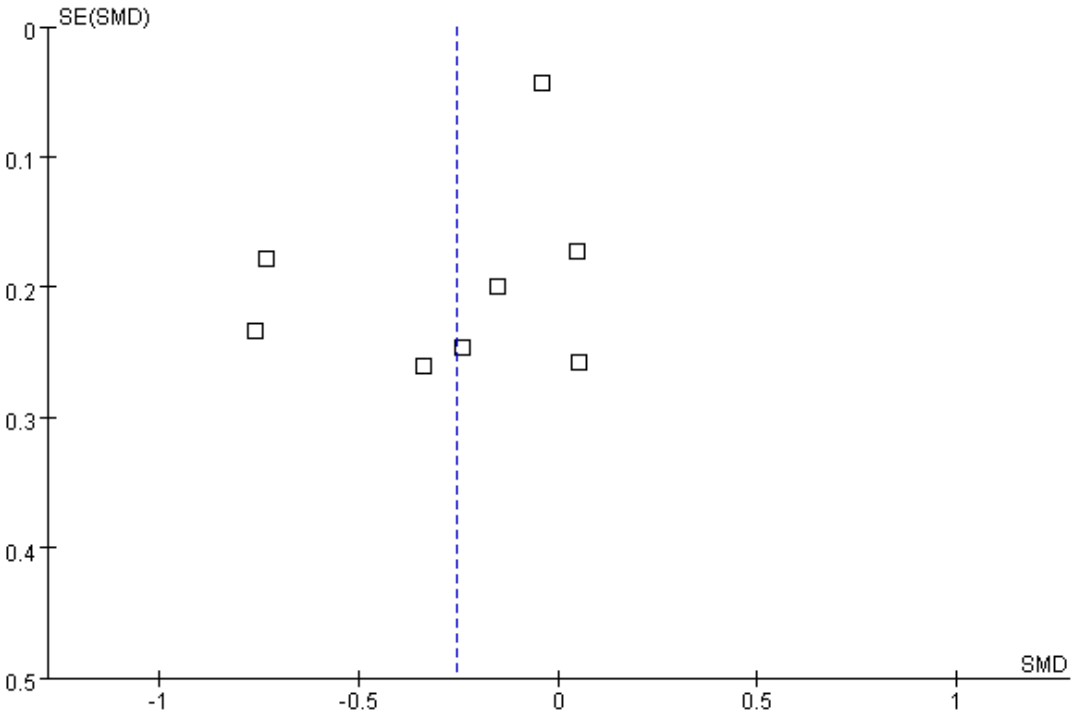


Figure 9. Funnel plot of comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), outcome: 1.6 Anxiety.



Sensitivity analyses

Two sensitivity analyses were performed: the first to evaluate the choice of random rather than fixed effects analyses, and the second to assess potential bias arising from the inclusion of the ENRICHD 2000 study. In no cases was the inference of a fixed analysis different from that of a random effects analysis. The largest difference between fixed and random effects analyses was found for anxiety: random RR -0.25 (95% CI -0.48 to -0.03) versus fixed RR -0.10 (95% CI -0.18 to -0.03). Differences between random and fixed effects for other analyses were small; for total mortality RR 0.89 (95% CI 0.75 to 1.05) versus 0.89 (95% CI 0.76 to 1.03); for cardiac mortality RR 0.80 (95% CI 0.64 to 1.00); versus 0.78 (95% CI 0.62 to 0.98); for revascularisation RR 0.95 (95% CI 0.80 to 1.13) versus 0.95 (95% CI 0.84 to 1.08); for non-fatal MI RR 0.87 (95% CI 0.67 to 1.13) versus 0.91 (95% CI 0.78 to 1.06); for depression SMD -0.21 (95% CI -0.35 to -0.08) versus -0.17 (95% CI -0.23 to -0.11).

Because the ENRICHD 2000 trial was large and included some patients treated with antidepressant medication unavailable to control participants, we wished to assess the impact of this trial on our overall findings. Excluding ENRICHD 2000, inferences for all outcomes were unchanged, and inferences for the Egger tests used to assess small study bias were similarly unaffected.

Other outcomes

HRQoL outcomes and other psychological outcomes are reported in Table 2 and Table 3. Only one of the seven studies reporting HRQoL outcomes indicated a superiority of psychological intervention over usual care; the ENRICHD 2000 study found statistically significant, but clinically unimportant improvements on three out of four QoL measures used. Other studies finding no differences on HRoL outcomes included Appels 2005, Claesson 2005, HofmanBang 1999, Mayou 2002 and Michalsen 2005. Two studies reported anger as an outcome (HofmanBang 1999; Michalsen 2005), but neither indicated an effect of treatment. Two studies reported measures of perceived stress (Claesson 2005; Michalsen 2005), with inconclusive results. Four studies reported outcomes related to type-A behaviours (HofmanBang 1999; Michalsen 2005; RCCP 1982; Sebregts 2005), yielding seven data points, of which only three indicated superiority of treatment to usual care. Finally, two of three studies reporting exhaustion (patient self-report) as an outcome found treatment su-

perior to usual care (Claesson 2005; Koertge 2008 but not Sebregts 2005). For convenience, data for outcomes not included in this update review but extracted in the previous version are shown in Table 4.

Meta-regression analyses

Because of the relatively small number of studies included in the review, we limited our exploration of study heterogeneity to a series of univariate meta-regression analyses and used the two most commonly reported outcomes: i.e. total mortality and depression. Results are presented in Table 1.

Consistent with the lack of statistical heterogeneity in total mortality across the trials, none of the predictor variables of interest were found to be statistically significant in meta-regression analyses for total mortality. However, for depression, four variables were found to significantly predict study effect sizes: (1) Interventions which aimed to treat type-A behaviours including anger and hostility (ß = -0.32, P = 0.03) were more effective than other interventions. In contrast, interventions which (2) presented risk-education information (ß = 0.23, P = 0.03), (3) included client-led discussion and emotional support as core therapeutic components (ß = 0.31, P < 0.01), or (4) where family members were included in the treatment process (ß = 0.26, P < 0.01) were significantly less effective.

DISCUSSION

Findings

We found no strong evidence that psychological intervention, compared to usual care, reduced total deaths or risk of revascularisation or non-fatal infarction in patients with CHD . However, we did observe significantly fewer deaths attributed to cardiac causes amongst treated patients. We note that a risk ratio of 0.89 for total mortality amongst a population at high risk, whilst not reaching statistical significance, may still be of clinical interest. Furthermore, psychological intervention did result in small to moderate improvements in depression and anxiety. There was no consistent evidence of a positive effect on HRQoL or other psychological outcomes, including perceived stress, type-A behaviours, anger, and perceived exhaustion. Type-A behaviour as a treatment target was positively associated with intervention effects for depression, while the inclusion of family in treatment, provision of risk information, and inclusion of client-led discussion and emotional support were negatively associated with depression outcomes.

This systematic review differs from the previous Cochrane review in two important ways. Although we undertook a comprehensive update of the literature using an extensive search strategy, we restricted inclusion to studies for which staff had received training in psychological intervention, and also to studies that isolated the specific effects of psychological therapy from other non-psychological interventions (such as exercise training). Nevertheless, the conclusions of this update review are very similar to those of the original Cochrane review (Rees 2004), and also to another independent update of the Cochrane review (Welton 2009). In contrast, Linden et al (Linden 2007) reported a reduction in all-cause mortality at follow-up of two years with psychological intervention compared usual care (OR 0.72 (95% CI 0.56 to 0.94)). Differences between our results and the Linden analyses are likely to be due to study selection; whereas this Cochrane review excluded studies with a follow up of less than six months, Linden et al did not. Differences between the meta-regression analyses presented here and those of Welton et al are also likely to be related to study selection. In common with the previous Cochrane review, Welton 2009 included studies in which psychological treatments were combined with other interventions, including exercise. It is a particular concern that interventions identified as 'behavioural' in the Welton review may have had a greater likelihood of including exercise, which is recognised to be effective in reducing morbidity and mortality and may also reduce psychological symptoms. Although one large study included in this review (ENRICHD 2000) provided patients which enhanced access to antidepressant medication, a sensitivity analysis indicated that this did not unduly influence our results: effects for total mortality, cardiac mortality, revascularisation and non-fatal MI were attenuated by the inclusion of ENRICHD 2000, while effects for depression were slightly enhanced. We also note that Kuper et al (Kuper 2009) found no evidence for a reduction in mortality in resulting from cognitive behavior therapy for depression. However this review gathered evidence from only 4 studies, of which only one (ENRICHD 2000) was included in our analyses.

The wide variation in the types of intervention used to treat cardiac patients included in this review reflects uncertainty in the theoretical and empirical literature linking emotion with cardiac outcomes, and the substantial clinical heterogeneity observed in the included studies was reflected in significant statistical heterogeneity for psychological outcomes (for depression I^2 = 70%, for anxiety I^2 = 72%). Although the finding that negative emotions, and depression in particular, are related to poor cardiac outcomes is well established, there are numerous mechanisms that may explain this relationship. Relevant mechanisms include, but are not limited to, the association of depression with cardiac risk factors including smoking, hypertension and reduced functional capacity; higher rates of non-adherence to cardiac prevention and treatment regimes amongst depressed patients; reduced heart-rate variability reflecting changes in cardiac autonomic tone in depressed patients; increased platelet aggregation; and inflammatory processes (Carney 2002). Thus, psychological treatments may appear effective in treating psychological symptoms of CHD patients but there is considerable uncertainty due to the heterogeneity between trials. Uncertainly also remains regarding the subgroups of patients who would benefit most from treatment and the characteristics of

successful interventions. The effects of treatments included here may be mediated by any or all of these mechanisms, and considerable work remains to clarify these relationships.

Strengths and limitations

We believe this to be the most comprehensive systematic review of RCT-based evidence for the impact of psychological interventions on patients with CHD to date. Nonetheless, we acknowledge this review is subject to a number of potential limitations. First, the details of intervention (and control) and trial methodology were often poorly reported. This made it difficult to categorise and compare the psychological interventions under investigation across studies. Although out meta-regression analyses did find some predictors of successful studies, substantial heterogeneity was found for psychological outcomes, and these data should be interpreted with caution.

The lack of methodological detail limited our ability to assess risk of bias. Smaller studies in this field may pose a high risk of bias and have the potential to overestimate the effect of psychological treatment, particularly through selective outcome reporting and the lack of blinding of outcome assessments. Secondly, although a specific goal of this update review was to clarify the impact of psychological treatment on clinical events, most included trials were relatively small and of short-term follow-up, so that the number of deaths and hospitalisations reported by the majority of trials was small. Despite the relatively short time frames, the continuous outcomes pooled here (depression, anxiety) suffered from high rates of missing data at follow up (21% overall for depression outcomes, 16% for anxiety), necessitating a cautious interpretation of the pooled effects. Furthermore, the incidence of missing data was greater in control conditions than in treatment conditions, which may constitute an additional source of bias. Even among larger studies the failure to follow up a sizeable number of patients (e.g. 7% in ENRICHD 2000, 9.5% in RCCP 1982), may also constitute a risk of attrition bias. We did not collect data on the socio-economic status, age or ethnicity of study participants (this was typically not reported), but participants were primarily male and most studies were conducted in developed nations (Europe and the USA). As such, it is not clear whether our findings generalise to women, or to the population in general. Our sensitivity analysis revealed that excluding our only Chinese study altered the inference for Anxiety outcomes. A limitation of our meta-regression analyses is that two studies (ENRICHD 2000, Jones 1996) contributed such a large proportion of the data (e.g. for total mortality, 72% of participants). Finally, our meta-analyses of the continuous outcomes of depression and anxiety required us to impute variances for the within-group changes from baseline to follow-up for a number of studies. It is, however, reassuring that our findings were not sensitive to the level of correlation used in this imputation. Finally

AUTHORS' CONCLUSIONS

Implications for practice

Psychological treatments appear to be effective in reducing psychological symptoms in patients with CHD, although many of the patients treated were not diagnosed with any specific psychological condition, and many may not have met conventional diagnostic criteria for, for example, depression. Few studies included only patients meeting a clinical threshold for psychological symptoms, and in studies with patients with and without diagnosed psychopathology at baseline, outcomes were not reported separately for these patient groups. Meta-regression analysis did show some evidence that patients with psychopathology at baseline experienced smaller reductions in depression that those without psychopathology, but there is currently no strong basis for targeting psychological treatments to a particular subgroup of cardiac patients. Although we did not find that the total number of hours spent in psychological treatment was predictive of outcome, we did find evidence that intervention programmes which targeted type-A behaviours were most likely to be effective. Further study is required to investigate the finding that involvement of family members in treatment predicted poorer outcomes for depression - it may be the case that patients require at least some time removed from the interpersonal demands of family life to experience improvements in psychological symptoms. Similarly, the inclusion of risk information and client-led discussion or emotional support in treatment may need to be balanced against the need to attend directly to psychological symptoms.

Implications for research

Heterogeneity in the psychological treatments offered to this patient group reflects a broader uncertainty about the mechanisms by which negative emotions affect cardiac outcomes. The questions of how psychological treatments work in this patient group, and which components of treatment are necessary, remain largely unanswered. Future research should address these points explicitly using component-studies (e.g. Jacobson 1996), and by evaluating the optimum duration and modality of treatment. Longitudinal studies identifying psychological and physiological mediators of outcome may also have value, and could help shed light on the basic processes by which psychological treatments are effective for this patient group. In addition, researchers should pay greater attention to the reporting of trial results, and the description of the interventions delivered. The generalisability and implementation of positive results is undermined when insufficient information is provided to replicate the intervention.

ACKNOWLEDGEMENTS

We would like to acknowledge all authors who provided additional information on request (authors from the following trials - ENRICHD 2000, Jones 1996, Oldenburg 1985) and Cornelia Junghans for Russian and German translations. Ben Whalley was supported by an ESRC postdoctoral fellowship (PTA-026-27-2113).

REFERENCES

References to studies included in this review

Appels 2005 *{published data only}*

* Appels A, Bär F, van der Pol G, Erdman R, Assman M, Trijsburg W, et al.Effects of treating exhaustion in angioplasty patients on new coronary events: results of the randomized exhaustion intervention trial (EXIT). *Psychosomatic Medicine* 2005;**67**(2):217–23.

Appels A, van Elderen T, Bär F, van der Pol G, Erdman RA, Assman M, et al.Effects of a behavioural intervention on quality of life and related variables in angioplasty patients: results of the exhaustion intervention trial. *Journal of Psychosomatic Research* 2006;**61**(1):1–7.

Black 1998 *{published data only}*

Black JL, Allison TG, Williams DE, Rummans TA, Gau GT. Effect of intervention for psychological distress on rehospitalization rates in cardiac rehabilitation patients. *Psychosomatics* 1998;**39**(2):134–43.

Brown 1993 *{published data only}*

Brown MA, Munford AM, Munford PR. Behavior therapy of psychological distress in patients after myocardial infarction or coronary bypass. *Journal of Cardiopulmonary Rehabilitation* 1993;**13**(3):201–10.

Burell 1996a *{published data only}*

Burell G. Behaviour modification after coronary artery bypass graft surgery: effects on cardiac morbidity and mortality. *Journal of Rehabilitation Science* 1995;**8**:39–40.

* Burell G. Group psychotherapy in Project New Life: treatment of coronary-prone behaviors for patients who have had coronary artery bypass graft surgery. In: Allan R, Scheidt S editor(s). *Heart and Mind*. Washington: American Psychological Association, 1996:291–310.

Burgess 1987 *{published data only}*

Burgess AW, Lerner DJ, D'Agostino RB, Vokonas PS. A randomized control trial of cardiac rehabilitation. *Social Science & Medicine* 1987;**24**(4):359–70.

Claesson 2005 *{published data only}*

Burell G, Granlund B. Women's hearts need special treatment. *International Journal of Behavioral Medicine* 2002;**9**(3):228–42.

* Claesson M, Birgander L, Lindahl B, Nasic S, Aström M, Asplund K, et al.Women's hearts: stress management for women with ischemic heart disease: explanatory analyses of a randomized controlled trial. *Journal of Cardiopulmonary Rehabilitation* 2005;**25**(2):93–102.

Claesson M, Birgander LS, Jansson JH, Lindahl B, Burell G, Asplund K, et al.Cognitive-behavioural stress management does not improve biological cardiovascular risk indicators in women with ischaemic heart disease: a randomized-controlled trial. *Journal of Internal Medicine* 2006;**260**(4):320–31.

Cowan 2001 *{published data only}*

Cowan MJ, Pike KC, Kogan BH. Psychosocial nursing therapy following sudden cardiac arrest: impact on two-year survival. *Nursing Research* 2001;**50**(2):68–76.

Elderen 1994 *{published data only}*

Elderen-van-Kemenade T, Maes S, van-den-Broek Y. Effects of a health education programme with telephone follow-up during cardiac rehabilitation. *British Journal of Clinical Psychology* 1994;**33**(3):367–78.

ENRICHD 2000 *{published data only}*

Blumenthal J, Babyak M, Carney R, Huber M, Saab P, Burg M, et al.Exercise, depression, and mortality after myocardial infarction in the ENRICHD trial. *Medicine and Science in Sports and Exercise* 2004;**36**(5):746–55.

Carney R, Blumenthal J, Freedland K, Youngblood M, Veith R, Burg M, et al.Depression and late mortality after myocardial infarction in the Enhancing Recovery in Coronary Heart Disease ENRICHD study. *Psychosomatic Medicine* 2004;**66**(4):466–74.

Cowan MJ, Freedland KE, Burg MM, Saab PG, Youngblood ME, Cornell CE, et al.Predictors of treatment response for depression and inadequate social support--the ENRICHD randomized clinical trial. *Psychotherapy & Psychosomatics* 2008;**77**(1):27–37.

ENRICHD investigators. Enhancing Recovery in Coronary Heart Disease (ENRICHD) study intervention: rationale and design. *Psychosomatic Medicine* 2001;**63**(5):747–55.

ENRICHD Investigators Writing Committee. Effects of treating depression and low perceived social support on clinical events after myocardial infarction: the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) randomized trial. *JAMA* 2003;**289**(23):3106–16.

ENRICHD Investigators Writing Committee. Effects of treating depression and low perceived social support on clinical events after myocardial infarction: the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Randomized Trial. *JAMA* 2003;**289**(23):3106–16.

Froelicher E, Miller N, Buzaitis A, Pfenninger P, Misuraco

A, Jordan S, et al.The Enhancing Recovery in Coronary Heart Disease Trial ENRICHD: strategies and techniques for enhancing retention of patients with acute myocardial infarction and depression or social isolation. *Journal of Cardiopulmonary Rehabilitation* 2003;**23**(4):269–80.
Lett H, Blumenthal J, Babyak M, Catellier D, Carney R, Berkman L, et al.Social support and prognosis in patients at increased psychosocial risk recovering from myocardial infarction. *Health Psychology* 2007;**26**(4):418–27.
Little D. An intervention to treat depression and increase social support did not prolong event-free survival in coronary heart disease. ACP Journal Club 2004; Vol. 140, issue 1:8.
Louis AA, Manousos R, Coletta AP, Clark AL, Cleland JGF. Clinical trials update: The Heart Protection Study, IONA, CARISA, ENRICHD, ACUTE, ALIVE, MADIT II and REMATCH. Impact Of Nicorandil on Angina. Combination Assessment of Ranolazine In Stable Angina. Enhancing Recovery In Coronary Heart Disease patients. Assessment of Cardioversion Using Transoesophageal Echocardiography. AzimiLide post-Infarct surVival Evaluation. Randomised Evaluation of Mechanical Assistance for Treatment of Chronic Heart failure. *European Journal of Heart Failure* 2002;**4**(1):111–6.
Mendes de Leon CF, Czajkowski S, Freedland K, Bang H, Powell L, Wu C, et al.The effect of a psychosocial intervention and quality of life after acute myocardial infarction: the Enhancing Recovery in Coronary Heart Disease ENRICHD clinical trial. *Journal of Cardiopulmonary Rehabilitation* 2006;**26**(1):9–13.
Schneiderman N, Saab P, Catellier D, Powell L, DeBusk R, Williams R, et al.Psychosocial treatment within sex by ethnicity subgroups in the Enhancing Recovery in Coronary Heart Disease clinical trial. *Psychosomatic Medicine* 2004;**66**(4):475–83.
* The ENRICHD Investigators. Enhancing recovery in coronary heart disease patients (ENRICHD): study design and methods. *American Heart Journal* 2000;**139**(1 Pt 1):1–9.
Trockel M, Burg M, Jaffe A, Barbour K, Taylor CB. Smoking behavior postmyocardial infarction among ENRICHD trial participants: cognitive behavior therapy intervention for depression and low perceived social support compared with care as usual. *Psychosomatic Medicine* 2008;**70**(8):875–82.

Gallacher 1997 *{published data only}*
Gallacher JEJ, Hopkinson CA, Bennett P, Burr ML, Elwood PC. Effect of stress management on angina. *Psychology and Health* 1997;**12**(4):523–32.

HofmanBang 1999 *{published data only}*
HofmanBang C, Lisspers J, Nordlander R, Nygren A, Sundin O, Ohman A, et al.Two-year results of a controlled study of residential rehabilitation for patients treated with percutaneous transluminal coronary angioplasty - a randomized study of a multifactorial programme. *European Heart Journal* 1999;**20**(20):1465–74.
* Lisspers J, Sundin O, Hofman-Bang C, Nordlander R, Nygren A, Ryden L, et al.Behavioral effects of a comprehensive, multifactorial program for lifestyle change after percutaneous transluminal coronary angioplasty: A prospective, randomized, controlled study. *Journal of Psychosomatic Research* 1999;**46**(2):143–54.
Lisspers J, Sundin O, Ohman A, Hofman B, Rydén L, Nygren A. Long-term effects of lifestyle behavior change in coronary artery disease: effects on recurrent coronary events after percutaneous coronary intervention. *Health Psychology* 2005;**24**(1):41–8.

Ibrahim 1974 *{published data only}*
Ibrahim MA, Feldman JG, Sultz HA, Staiman MG, Young LJ, Dean D. Management after myocardial infarction: A controlled trial of the effect of group psychotherapy. *International Journal of Psychiatry in Medicine* 1974;**5**(3):253–68.

Jones 1996 *{published data only}*
Jones DA, West RR. Psychological rehabilitation after myocardial infarction: multicentre randomised controlled trial. *BMJ* 1996;**313**(7071):1517–21.

Koertge 2008 *{published data only}*
Koertge J, Janszky I, Sundin O, Blom M, Georgiades A, László KD, et al.Effects of a stress management program on vital exhaustion and depression in women with coronary heart disease: a randomized controlled intervention study. *Journal of Internal Medicine* 2008;**263**(3):281–93.

Mayou 2002 *{published data only}*
Mayou R, Thompson D, Clements A, Davies C, Goodwin S, Normington K, et al.Guideline-based early rehabilitation after myocardial infarction: a pragmatic randomised controlled trial. *Journal of Psychosomatic Research* 2002;**52**(2):89–95.

McLaughlin 2005 *{published data only}*
Bambauer KZ, Aupont O, Stone PH, Locke SE, Mullan MG, Colagiovanni J, et al.The effect of a telephone counseling intervention on self-rated health of cardiac patients. *Psychosomatic Medicine* 2005;**67**(4):539–45.
* McLaughlin T, Aupont O, Bambauer K, Stone P, Mullan M, Colagiovanni J, et al.Improving psychologic adjustment to chronic illness in cardiac patients: the role of depression and anxiety. *Journal of General Internal Medicine* 2005;**20**(12):1084–90.

Michalsen 2005 *{published data only}*
Michalsen A, Grossman P, Lehmann N, Knoblauch N, Paul A, Moebus S, et al.Psychological and quality-of-life outcomes from a comprehensive stress reduction and lifestyle program in patients with coronary artery disease: results of a randomized trial. *Psychotherapy and Psychosomatics* 2005;**74**(6):344–52.

Oldenburg 1985 *{published data only}*
Oldenburg B, Perkins RJ, Andrews G. Controlled trial of psychological intervention in myocardial infarction. *Journal of Consulting & Clinical Psychology* 1985;**53**(6):852–9.

Peng 2005 *{published data only}*
Peng J, Jiang LJ. Psychotherapy on negative emotions for the incidence of ischemia-related events in patients

with coronary heart disease. *Chinese Journal of Clinical Rehabilitation* 2005;**9**(4):38–9.

Rahe 1979 ***{published data only}***

Rahe RH, Ward HW, Hayes V. Brief group therapy in myocardial infarction rehabilitation: three- to four-year follow-up of a controlled trial. *Psychosomatic Medicine* 1979; **51**(3):229–42.

RCCP 1982 ***{published data only}***

Friedman M, Thoresen CE, Gill JJ. Alteration of type A behavior and its effect on cardiac recurrences in post myocardial infarction patients: summary results of the recurrent coronary prevention project. *American Heart Journal* 1986;**112**(4):653–65.

* Friedman M, Thoresen CE, Gill JJ, Ulmer D, Thompson L, Powell L, et al.Feasibility of altering type A behaviour pattern after myocardial infarction. *Circulation* 1982;**66**(1): 83–92.

Mendes-de Leon C, Powell LH, Kaplan BH. Change in coronary-prone behaviors in the recurrent coronary prevention project. *Psychosomatic Medicine* 1991;**53**(4): 407–19.

Powell LH. Can the type A behavior pattern be altered after myocardial infarction? A second year report from the Recurrent Coronary Prevention Project. *Psychosomatic Medicine* 1984;**46**(4):293–313.

Powell LH, Thoresen CE. Effects of type A behavioral counseling and severity of prior acute myocardial infarction on survival. *American Journal of Cardiology* 1988;**62**(17): 1159–63.

Sebregts 2005 ***{published data only}***

Sebregts E, Falger P, Appels A, Kester A, Bär F. Psychological effects of a short behavior modification program in patients with acute myocardial infarction or coronary artery bypass grafting A randomized controlled trial. *Journal of psychosomatic research* 2005;**58**(5):417–24.

Stern 1983 ***{published data only}***

Stern MJ, Gorman PA, Kaslow L. The group counseling v exercise therapy study. A controlled intervention with subjects following myocardial infarction. *Archives of Internal Medicine* 1983;**143**(9):1719–25.

Van Dixhoorn 1999 ***{published data only}***

Van-Dixhoorn J, Duivenvoorden HJ, Pool J, Verhage F. Psychic effects of physical training and relaxation therapy after myocardial infarction. *Journal of Psychosomatic Research* 1990;**34**(3):327–37.

Van-Dixhoorn J, Duivenvoorden HJ, Staal HA, Pool J. Physical training and relaxation therapy in cardiac rehabilitation assessed through a composite criterion for training outcome. *American Heart Journal* 1989;**118**(3): 545–52.

Van-Dixhoorn J, Duivenvoorden HJ, Staal JA, Pool J, Verhage F. Cardiac events after myocardial infarction: possible effect of relaxation therapy. *European Heart Journal* 1987;**8**(11):1210–4.

* Van-Dixhoorn JJ, Duivenvoorden HJ. Effect of relaxation therapy on cardiac events after myocardial infarction: a 5-year follow-up study. *Journal of Cardiopulmonary Rehabilitation* 1999;**19**(3):178–85.

References to studies excluded from this review

-Vestfold-Heartcare-Study-Group 2003 ***{published data only}***

Vestfold-Heartcare-Study-Group. Influence on lifestyle measures and five-year coronary risk by a comprehensive lifestyle intervention programme in patients with coronary heart disease. *European Journal of Cardiovascular Prevention and Rehabilitation* 2003;**10**(6):429–37.

Allison 2000 ***{published data only}***

Allison TG, Farkouh ME, Smars PA, Evans RW, Squires RW, Gabriel SE, et al.Management of coronary risk factors by registered nurses versus usual care in patients with unstable angina pectoris (a chest pain evaluation in the emergency room [CHEER] substudy). *American Journal of Cardiology* 2000;**86**(2):133–8.

Bagheri 2007 ***{published data only}***

Bagheri H, Memarian R, Alhani F. Evaluation of the effect of group counselling on post myocardial infarction patients: determined by an analysis of quality of life. *Journal of Clinical Nursing* 2007;**16**(2):402–6.

Bay 2008 ***{published data only}***

Bay PS, Beckman D, Trippi J, Gunderman R, Terry C. The effect of pastoral care services on anxiety, depression, hope, religious coping, and religious problem solving styles: a randomized controlled study. *Journal of Religion & Health* 2008;**47**(1):57–69.

Bettencourt 2005 ***{published data only}***

Bettencourt N, Dias C, Mateus P, Sampaio F, Santos L, Adao L, et al.Impact of cardiac rehabilitation on quality of life and depression after acute coronary syndrome [Impacto da reabilitacao cardiaca na qualidade–de–vida e sintomatologia depressiva apos sindroma coronaria aguda]. *Revista Portuguesa de Cardiologia* 2005;**24**(5):687–96.

Bishop 2005 ***{published data only}***

Bishop G, Kaur D, Tan V, Chua Y, Liew S, Mak K. Effects of a psychosocial skills training workshop on psychophysiological and psychosocial risk in patients undergoing coronary artery bypass grafting. *American Heart Journal* 2005;**150**(3):602–9.

Blumenthal 2005 ***{published data only}***

Blumenthal JA, Sherwood A, Babyak MA, Watkins LL, Waugh R, Georgiades A, et al.Effects of exercise and stress management training on markers of cardiovascular risk in patients with ischemic heart disease: a randomized controlled trial. *JAMA* 2005;**293**(13):1626–34.

Brodie 2008 ***{published data only}***

Brodie DA, Inoue A, Shaw DG. Motivational interviewing to change quality of life for people with chronic heart failure: a randomised controlled trial. *International Journal of Nursing Studies* 2008;**45**(4):489–500.

Buckley 2007 ***{published data only}***

Buckley T, McKinley S, Gallagher R, Dracup K, Moser DK, Aitken LM. The effect of education and counselling

on knowledge, attitudes and beliefs about responses to acute myocardial infarction symptoms. *European Journal of Cardiovascular Nursing* 2007;**6**(2):105–11.

Burell 1996b *{published data only}*
Burell G. Group psychotherapy in Project New Life: treatment of coronary-prone behaviors for patients who have had coronary artery bypass graft surgery. In: Robert A, Scheidt S editor(s). *Heart & Mind: The Practice of Cardiac Psychology*. Washington DC: American Psychological Association, 1996:291–310.

Carson 1988 *{published data only}*
Carson M, Hathaway A, Tuohey J, McKay B. The effect of a relaxation technique on coronary risk factors. *Behavioral Medicine* 1988;**14**(2):71–7.

Chen 2005 *{published data only}*
Chen W, Guo LH, Li YW, Guo SQ, Li Z. Effect of cognitive education on the physical and psychological rehabilitation of patients with coronary heart disease after interventional therapy. *Chinese Journal of Clinical Rehabilitation* 2005;**9**(7):1–3.

Clark 2007 *{published data only}*
Clark N, Janz N, Dodge J, Lin X, Trabert B, Kaciroti N, et al.Heart disease management by women: does intervention format matter?. Health Education and Behavior 2007, issue epub:15 Dec 2007.

de-Klerk 2004 *{published data only}*
de-Klerk JE, du-Plessis WF, Steyn HS, Botha M. Hypnotherapeutic ego strengthening with male South African coronary artery bypass patients. *The American Journal of Clinical Hypnosis* 2004;**47**(2):79–92.

DeBusk 1994a *{published data only}*
DeBusk RF, Miller NH, Superko HR, Dennis CA, Thomas RJ, Lew HT, et al.A case-management system for coronary risk factor modification after acute myocardial infarction. *Annals of Internal Medicine* 1994;**120**(9):721–9.

del Pino 2005 *{published data only}*
del Pino A, Gaos MT, Dorta R, García M. Modification of coronary-prone behaviors in coronary patients of low socio-economic status. *Spanish Journal of Psychology* 2005;**8**(1):68–78.

Dusseldorp 1999 *{published data only}*
Dusseldorp E, van Elderen T, Maes S, Meulman J, Kraaij V. A meta-analysis of psychoeducational programs for coronary heart disease patients. *Health Psychology* 1999;**18**(5):506–19.

Erdman 1983 *{published data only}*
* Erdman RAM, Duivenvoorden, HJ, Verhage F, Kazemier M, Hugenholtz PG. Predictability of beneficial effects in cardiac rehabilitation: a randomized clinical trial of psychosocial variables. *Journal of Cardiopulmonary Rehabilitation and Prevention* 1986;**6**(6):206–13.
* Erdman RAM, Duivenvoorden HJ. Psychologic evaluation of a cardiac rehabilitation program: a randomized clinical trial in patients with myocardial infarction. *Journal of Cardiopulmonary Rehabilitation and Prevention* 1983;**3**(10):696–704.

Fang 2003 *{published data only}*
Fang R, Jiang Y, Song J, Cheng G, Xue G. Control study of general psychological intervention for patients with myocardial infarction. *Chinese Journal of Clinical Rehabilitation* 2003;**7**(9):1382–3.

Focht 2004 *{published data only}*
Focht B, Brawley L, Rejeski W, Ambrosius W. Group-mediated activity counseling and traditional exercise therapy programs: effects on health-related quality of life among older adults in cardiac rehabilitation. *Annals of Behavioral Medicine* 2004;**28**(1):52–61.

Frasure-Smith 1985 *{published data only}*
Frasure-Smith N, Prince R. Long-term follow-up of the Ischemic Heart Disease Life Stress Monitoring Program. *Psychosomatic Medicine* 1989;**51**(5):485–513.
* Frasure-Smith N, Prince R. The ischemic heart disease life stress monitoring program: impact on mortality. *Psychosomatic Medicine* 1985;**47**(5):431–45.
Frasure-Smith N, Prince RH. The Ischemic Heart Disease Life Stress Monitoring Program: possible therapeutic mechanisms. *Psychology and Health* 1987;**1**(3):273–85.

Frasure-Smith 1997 *{published data only}*
Frasure-Smith N, Lesperance F, Prince RH, Verrier P, Garber RA, Juneau M, et al.Randomised trial of home-based psychosocial nursing intervention for patients recovering from myocardial infarction. *Lancet* 1997;**350**(9076):473–9.

Fridlund 1991 *{published data only}*
Fridlund B, Hogstedt B, Lidell E, Larsson PA. Recovery after myocardial infarction: effects of a caring rehabilitation programme. *Scandinavian Journal of Caring Sciences* 1991;**5**(1):23–32.

Friedman 1986 *{published data only}*
Friedman M, Thoresen C, Gill J, Ulmer D, Powell L, Price V, et al.Alteration of type A behavior and its effect on cardiac recurrences in post myocardial infarction patients: summary results of the recurrent coronary prevention project. *American Heart Journal* 1986;**112**(4):653–65.

Gallagher 2003 *{published data only}*
Gallagher R, McKinley S, Dracup K. Effects of a telephone counseling intervention on psychosocial adjustment in women following a cardiac event. *Heart & Lung* 2003;**32**(2):79–87.

Giannuzzi 2008 *{published data only}*
Giannuzzi P, Temporelli PL, Marchioli R, Maggioni AP, Balestroni G, Ceci V, et al.Global secondary prevention strategies to limit event recurrence after myocardial infarction: results of the GOSPEL study, a multicenter, randomized controlled trial from the Italian Cardiac Rehabilitation Network. *Archives of Internal Medicine* 2008;**168**(20):2194–204.

Goodman 2008 *{published data only}*
Goodman H, Parsons A, Davison J, Preedy M, Peters E, Shuldham C, et al.A randomised controlled trial to evaluate a nurse-led programme of support and lifestyle management for patients awaiting cardiac surgery 'Fit for surgery: Fit for

life' study. *European Journal of Cardiovascular Nursing* 2008; **7**(3):189–95.

Gruen 1975 *{published data only}*
Gruen W. Effects of brief psychotherapy during the hospitalization period on the recovery process in heart attacks. *Journal of Consulting and Clinical Psychology* 1975; **43**(2):223–32.

Gunnarsdottir 2007 *{published data only}*
Gunnarsdottir T, Jonsdottir H. Does the experimental design capture the effects of complementary therapy? A study using reflexology for patients undergoing coronary artery bypass graft surgery. *Journal of Clinical Nursing* 2007; **16**(4):777–85.

Gutschker 1982 *{published data only}*
Gutschker A, Schaller K, Geissler W. Results of a territorial random long-term study on the comprehensive rehabilitation of patients after acute myocardial infarction. *Das Deutsche Gesundheitswesen* 1982;**37**(20):918–31.

Hardcastle 2008 *{published data only}*
Hardcastle S, Taylor A, Bailey M, Castle R. A randomised controlled trial on the effectiveness of a primary health care based counselling intervention on physical activity, diet and CHD risk factors. *Patient Education & Counseling* 2008;**70** (1):31–9.

Harting 2006 *{published data only}*
Harting J, van Assema P, van Limpt P, Gorgels T, van Ree J, Ruland E, et al.Effects of health counseling on behavioural risk factors in a high-risk cardiology outpatient population: a randomized clinical trial. *European Journal of Cardiovascular Prevention and Rehabilitation* 2006;**13**(2): 214–21.

Hattan 2002 *{published data only}*
Hattan J, King L, Griffiths P. The impact of foot massage and guided relaxation following cardiac surgery: a randomized controlled trial. *Journal of Advanced Nursing* 2002;**37**(2):199–207.

Higgins 2001 *{published data only}*
Higgins HC, Hayes RL, McKenna KT. Rehabilitation outcomes following percutaneous coronary interventions (PCI). *Patient education and counseling* 2001;**43**(3):219–30.

Izawa 2005 *{published data only}*
Izawa K, Watanabe S, Omiya K, Hirano Y, Oka K, Osada N, et al.Effect of the self-monitoring approach on exercise maintenance during cardiac rehabilitation: a randomized, controlled trial. *American Journal of Physical Medicine & Rehabilitation* 2005;**84**(5):313–21.

Jaarsma 2008 *{published data only}*
Jaarsma T, van der Wal MH, Lesman-Leegte I, Luttik ML, Hogenhuis J, Veeger NJ, et al.Value of basic and intensive management of patients with heart failure; results of a randomised controlled clinical trial. *Nederlands Tijdschrift voor Geneeskunde* 2008;**152**(37):2016–21.

Jiang 2007 *{published data only}*
Jiang X, Sit J, Wong T. A nurse-led cardiac rehabilitation programme improves health behaviours and cardiac physiological risk parameters: evidence from Chengdu, China. *Journal of Clinical Nursing* 2007;**16**(10):1886–97.

Johansen 2003 *{published data only}*
Johansen S, Baumbach L, Jorgensen T, Willaing I. The effect of psychosocial rehabilitation after acute myocardial infarction A randomized controlled trial. *Ugeskrift for Laeger* 2003;**165**(34):3229–33.

Johnston 1999 *{published data only}*
Johnston M, Foulkes J, Johnston DW, Pollard B, Gudmundsdottir H. Impact on patients and partners of inpatient and extended cardiac counseling and rehabilitation: a controlled trial. *Psychosomatic Medicine* 1999;**61**(2):225–33.

Jolly 1998 *{published data only}*
* Jolly K, Bradley F, Sharp S, Smith H, Mant D. Follow-up care in general practice of patients with myocardial infarction or angina pectoris: initial results of the SHIP trial. Southampton Heart Integrated Care Project. *Family Practice* 1998;**15**(6):548–55.
Jolly K, Bradley F, Sharp S, Smith H, Thompson S, Kinmonth AL, et al.Randomised controlled trial of follow up care in general practice of patients with myocardial infarction and angina: final results of the Southampton heart integrated care project (SHIP). The SHIP Collaborative Group. *BMJ* 1999;**318**(7185):706–11.

Kanji 2004 *{published data only}*
Kanji N, White AR, Ernst E. Autogenic training reduces anxiety after coronary angioplasty: a randomized clinical trial. *American Heart Journal* 2004;**147**:E10.

Karlsson 2007 *{published data only}*
Karlsson MR, Edström-Plüss C, Held C, Henriksson P, Billing E, Wallén NH. Effects of expanded cardiac rehabilitation on psychosocial status in coronary artery disease with focus on type D characteristics. *Journal of Behavioral Medicine* 2007;**30**(3):253–61.

King 1988 *{published data only}*
King J, Nixon PG. A system of cardiac rehabilitation: Psychophysiological basis and practice. *British Journal of Occupational Therapy* 1988;**51**(11):378–84.

Klein 2007 *{published data only}*
Klein R, Bar-on E, Klein J, Benbenishty R. The impact of sexual therapy on patients after cardiac events participating in a cardiac rehabilitation program. *European Journal of Cardiovascular Prevention and Rehabilitation* 2007;**14**(5): 672–8.

Ku 2002 *{published data only}*
Ku S, Ku C, Ma F. Effects of phase I cardiac rehabilitation on anxiety of patients hospitalized for coronary artery bypass graft in Taiwan. *Heart & Lung* 2002;**31**(2):133–40.

Kummel 2008 *{published data only}*
Kummel M, Vahlberg T, Ojanlatva A, Karki R, Mattila T, Kivela SL. Effects of an intervention on health behaviors of older coronary artery bypass (CAB) patients. *Archives of Gerontology & Geriatrics* 2008;**46**(2):227–44.

Lahmann 2008 *{published data only}*
Lahmann C, Loew TH, Tritt K, Nickel M. Efficacy of functional relaxation and patient education in the treatment of somatoform heart disorders: a randomized, controlled clinical investigation. *Psychosomatics* 2008;**49**(5):378–85.

Lewin 2002 *{published data only}*
Lewin RJP, Furze G, Robinson J, Griffith K, Wiseman S, Pye M, et al.A randomised controlled trial of a self-management plan for patients with newly diagnosed angina. *The British Journal of General Practice* 2002;**52**(476):194–201.

Lewin 2009 *{published data only}*
Lewin RJ, Coulton S, Frizelle DJ, Kaye G, Cox H. A brief cognitive behavioural preimplantation and rehabilitation programme for patients receiving an implantable cardioverter-defibrillator improves physical health and reduces psychological morbidity and unplanned readmissions. *Heart* 2009;**95**(1):63–9.

Lidell 1996 *{published data only}*
Fridlund B, Pihlgren C, Wannestig LB. A supportive-educative caring rehabilitation programme; improvements of physical health after myocardial infarction. *Journal of Clinical Nursing* 1992;**1**(1):141–6.
* Lidell E, Fridlund B. Long-term effects of a comprehensive rehabilitation programme after myocardial infarction. *Scandinavian Journal of Caring Sciences* 1996;**10**(2):67–74.

Luszczynska 2006 *{published data only}*
Luszczynska A. An implementation intentions intervention, the use of a planning strategy, and physical activity after myocardial infarction. *Social Science & Medicine* 2006;**62**(4):900–8.

Luszczynska 2007 *{published data only}*
Luszczynska A, Scholz U, Sutton S. Planning to change diet: A controlled trial of an implementation intentions training intervention to reduce saturated fat intake among patients after myocardial infarction. *Journal of Psychosomatic Research* 2007;**63**(5):491–7.

MacIntyre 2008 *{published data only}*
MacIntyre B, Hamilton J, Fricke T, Ma W, Mehle S, Michel M. The efficacy of healing touch in coronary artery bypass surgery recovery: a randomized clinical trial. *Alternative Therapies in Health & Medicine* 2008;**14**(4):24–32.

Mandel 2007 *{published data only}*
Mandel S, Hanser S, Secic M, Davis B. Effects of music therapy on health-related outcomes in cardiac rehabilitation: a randomized controlled trial. *Journal of Music Therapy* 2007;**44**(3):176–97.

Mandel 2008 *{published data only}*
Mandel SE. *Effects of Music-Assisted Relaxation and Imagery (MARI) on health-related outcomes in cardiac rehabilitation: follow-up study [PhD dissertation]*. Boston, USA: Berklee College of Music, 2008.

Maroto 2005 *{published data only}*
Maroto Montero JM, Artigao Ramìrez R, Morales Durán MD, de Pablo Z, Abraira V. Cardiac rehabilitation in patients with myocardial infarction: a 10- year follow-up study. *Revista España ola de Cardiología* 2005;**58**(10):1181–7.

McGillion 2008 *{published data only}*
McGillion MH, Watt-Watson J, Stevens B, Lefort SM, Coyte P, Graham A. Randomized controlled trial of a psychoeducation program for the self-management of chronic cardiac pain. *Journal of Pain & Symptom Management* 2008;**36**(2):126–40.

McHugh 2001 *{published data only}*
McHugh F, Lindsay GM, Hanlon P, Hutton I, Brown MR, Morrison C, et al.Nurse led shared care for patients on the waiting list for coronary artery bypass surgery: a randomised controlled trial. *Heart* 2001;**86**(3):317–23.

Mitsibounas 1992 *{published data only}*
Mitsibounas DN, Tsouna-Hadjis ED, Rotas VR, Sideris DA. Effects of group psychosocial intervention on coronary risk factors. *Psychotherapy and Psychosomatics* 1992;**58**(2):97–102.

Mohiuddin 2007 *{published data only}*
Mohiuddin SM, Mooss AN, Hunter CB, Grollmes TL, Cloutier DA, Hilleman DE. Intensive smoking cessation intervention reduces mortality in high-risk smokers with cardiovascular disease. *Chest* 2007;**131**(2):446–52.

Nordmann 2001 *{published data only}*
Nordmann A, Heilmbauer I, Walker T, Martina B, Battegay E. A case-management program of medium intensity does not improve cardiovascular risk factor control in coronary artery disease patients: the Heartcare I trial. *The American Journal of Medicine* 2001;**110**(7):543–50.

Novoa 2008 *{published data only}*
Novoa R, Hammonds T. Clinical hypnosis for reduction of atrial fibrillation after coronary artery bypass graft surgery. *Cleveland Clinic Journal of Medicine* 2008;**75**(Suppl 2):S44–7.

Oldenburg 1995 *{published data only}*
Oldenburg B, Martin A, Greenwood J, Bernstein L, Allan R. A controlled trial of a behavioral and educational intervention following coronary artery bypass surgery. *Journal of Cardiopulmonary Rehabilitation* 1995;**15**(1):39–46.

Oldridge 1995 *{published data only}*
Hillers TK, Guyatt GH, Oldridge N, Crowe J, Willan A, Griffith L, et al.Quality of life after myocardial infarction. *Journal of Clinical Epidemiology* 1994;**4**:1287–96.
* Oldridge N, Streiner D, Hoffmann R, Guyatt G. Profile of mood states and cardiac rehabilitation after acute myocardial infarction. *Medicine & Science in Sports & Exercise* 1995;**27**(6):900–5.

Ornish 1990 *{published data only}*
Ornish D, Brown SE, Scherwitz LW, Billings JH, Armstrong WT, Ports TA, et al.Can lifestyle changes reverse coronary heart disease? The Lifestyle Heart Trial. *Lancet* 1990;**336**(8708):129–33.

Ornish 1998 *{published data only}*
Ornish D, Scherwitz LW, Billings JH, Brown SE, Gould KL, Merritt TA, et al.Intensive lifestyle changes for reversal of coronary heart disease. *JAMA* 1998;**280**(23):2001–7.

Parent 2000 *{published data only}*
Parent N, Fortin F. A randomized, controlled trial of vicarious experience through peer support for male first-time cardiac surgery patients: impact on anxiety, self-efficacy expectation, and self-reported activity. *Heart & Lung* 2000;**29**(6):389–400.

Paul 2006 *{published data only}*
Paul L, Polk D, Dwyer J, Velasquez I, Nidich S, Rainforth M, et al.Effects of a randomized controlled trial of transcendental meditation on components of the metabolic syndrome in subjects with coronary heart disease. *Archives of Internal Medicine* 2006;**166**(11):1218–24.

Petrie 2002 *{published data only}*
Petrie K, Cameron L, Ellis C, Buick D, Weinman J. Changing illness perceptions after myocardial infarction: an early intervention randomized controlled trial. *Psychosomatic Medicine* 2002;**64**(4):580–6.

PRECOR Group 1991 *{published data only}*
Comparison of a rehabilitation programme, a counselling programme and usual care after an acute myocardial infarction: results of a long-term randomized trial. European Heart Journal 1991; Vol. 12, issue 5:612–6.

Price 2004 *{published data only}*
Price JR. Treating low perceived social support and depression after myocardial infarction does not increase event-free survival. Evidence Based Mental Health 2004; Vol. 7, issue 1:22.

Pullen 2008 *{published data only}*
Pullen PR, Nagamia SH, Mehta PK, Thompson WR, Benardot D, Hammoud R, et al.Effects of yoga on inflammation and exercise capacity in patients with chronic heart failure. *Journal of Cardiac Failure* 2008;**14**(5):407–13.

Quist 2003 *{published data only}*
Quist P, Gallefoss F. Randomised controlled trial of smoking cessation intervention after admission for coronary heart disease. *BMJ* 2003;**327**(7426):1254–7.

Reid 2003 *{published data only}*
Reid R, Pipe A, Higginson L, Johnson K, Angelo M, Cooke D, et al.Stepped care approach to smoking cessation in patients hospitalized for coronary artery disease. *Journal of Cardiopulmonary Rehabilitation* 2003;**23**(3):176–82.

Robert-McComb 2004 *{published data only}*
Robert-McComb JJ, Tacon A, Randolph P, Caldera Y. A pilot study to examine the effects of a mindfulness-based stress- reduction and relaxation program on levels of stress hormones, physical functioning, and submaximal exercise responses. *Journal of Alternative and Complementary Medicine* 2004;**10**(5):819–27.

Salminen 2005 *{published data only}*
Salminen M, Isoaho R, Vahlberg T, Ojanlatva A, Irjala K, Kivel SL. Effects of health advocacy, counseling, and activation among older coronary heart disease (CHD) patients. *Aging - Clinical and Experimental Research* 2005; **17**(6):472–8.

Scholz 2006 *{published data only}*
Scholz U, Knoll N, Sniehotta F, Schwarzer R. Physical activity and depressive symptoms in cardiac rehabilitation: long-term effects of a self-management intervention. *Social Science & Medicine* 2006;**62**(12):3109–20.

Senuzun 2006 *{published data only}*
Senuzun F, Fadiloglu C, Burke L, Payzin S. Effects of home-based cardiac exercise program on the exercise tolerance, serum lipid values and self-efficacy of coronary patients. *European Journal of Cardiovascular Prevention and Rehabilitation* 2006;**13**(4):640–5.

Seskevich 2004 *{published data only}*
Seskevich J, Crater S, Lane J, Krucof M. Beneficial effects of noetic therapies on mood before percutaneous intervention for unstable coronary syndromes. *Nursing Research* 2004;**53** (2):116–21.

Sheps 2004 *{published data only}*
Sheps D, Frasure-Smith N, Freedland KE, Carney RM. The INTERHEART study: intersection between behavioral and general medicine. *Psychosomatic Medicine* 2004;**66**(6): 797–8.

Sinclair 2005 *{published data only}*
Sinclair A, Conroy S, Davies M, Bayer A. Post-discharge home-based support for older cardiac patients: a randomised controlled trial. *Age and Ageing* 2005;**34**(4):338–43.

Sniehotta 2006 *{published data only}*
Sniehotta F, Scholz U, Schwarzer R. Action plans and coping plans for physical exercise: A longitudinal intervention study in cardiac rehabilitation. *British Journal of Social Psychology* 2006;**11**(1):23–37.

Stenlund 2005 *{published data only}*
Stenlund T, Lindström B, Granlund M, Burell G. Cardiac rehabilitation for the elderly: Qi Gong and group discussions. *European Journal of Cardiovascular Prevention and Rehabilitation* 2005;**12**(1):5–11.

Thompson 1989 *{published data only}*
* Thompson DR. A randomized controlled trial of in-hospital nursing support for first time myocardial infarction patients and their partners: effects on anxiety and depression. *Journal of Advanced Nursing* 1989;**14**(4):291–7.
Thompson DR. Effect of in-hospital counseling on knowledge in myocardial infarction patients and spouses. *Patient Education and Counseling* 1991;**18**:171–7.
Thompson DR, Meddis R. A prospective evaluation of in-hospital counselling for first time myocardial infarction men. *Journal of Psychosomatic Medicine* 1990;**34**(3):237–48.
Thompson DR, Webster RA, Meddis R. In-hospital counselling for first-time myocardial infarction patients and spouses: effects on satisfaction. *Journal of Advanced Nursing* 1990;**15**(9):1064–9.

Toobert 1998 *{published data only}*
Toobert D, Glasgow R, Nettekoven L, Brown J. Behavioral and psychosocial effects of intensive lifestyle management

for women with coronary heart disease. *Patient Education and Counseling* 1998;**35**(3):177–88.

van Dixhoorn 1991 ***{published data only}***
van Dixhoorn. Self-observation in cardiac rehabilitation. In: Appels A editor(s). *Behavioral Observations in Cardiovascular Research*. Lisse: Swets & Zeitlinger, 1991: 130–77.

van Dixhoorn, 1983 ***{published data only}***
van Dixhoorn, de Loos, Duivenvoorden Hugo. Contribution of relaxation technique training to the rehabilitation of myocardial infarction patients. *Psychotherapy and Psychosomatics* 1983;**40**(1-4):137–47.

van Elderen 2001 ***{published data only}***
van Elderen T, Dusseldorp E. Lifestyle effects of group health education for patients with coronary heart disease. *Psychology and Health* 2001;**16**(3):327–41.

Vermeulen 1983 ***{published data only}***
Vermeulen A, Lie KI, Durrer D. Effects of cardiac rehabilitation after myocardial infarction: changes in coronary risk factors and long-term prognosis. *American Heart Journal* 1983;**105**(5):798–801.

Wan 2005 ***{published data only}***
Wan AL, Guo M, Zhang A. Influence of psychological intervention on the negative emotion of patients with coronary heart disease. *Chinese Journal of Clinical Rehabilitation* 2005;**9**(8):40–1.

Wyer 2001 ***{published data only}***
Wyer SJ, Earll L, Joseph S, Harrison J, Giles M, Johnston M. Increasing attendance at a cardiac rehabilitation programme: an intervention study using the theory of planned behaviour. *Coronary Health Care* 2001;**5**(3):154–9.

Xue 2008 ***{published data only}***
Xue F, Yao W, Lewin RJ. A randomised trial of a 5 week, manual based, self-management programme for hypertension delivered in a cardiac patient club in Shanghai. *BMC Cardiovascular Disorders* 2008;**May 6;8**:10.

Yeh 2008 ***{published data only}***
Yeh GY, Wayne PM, Phillips RS. T'ai Chi exercise in patients with chronic heart failure. *Medicine & Sport Science* 2008;**52**:195–208.

Zeng 2001 ***{published data only}***
Zeng W, Ma H, Liang Q, Dong Y, Ye H, Zhang Y. The influence of antidepressive therapy on short-term prognosis in elderly patients with unstable angina and depression. *Zhonghua nei ke za zhi [Chinese Journal of Internal Medicine]* 2001;**40**(12):809–10.

Zhu 2006 ***{published data only}***
Zhu JF. Interventional effect of Chinese daoistic cognitive therapy on type-A behavior of patients with coronary heart disease. *Chinese Journal of Clinical Rehabilitation* 2006;**10** (38):157–60.

References to studies awaiting assessment

James 2006 ***{published data only}***
James C. Effect of a psychosocial intervention on inflammatory markers in patients with coronary artery disease. *Dissertation Abstracts International: Section B: The Sciences and Engineering* 2006;**67**(4-B):2271.

Zetta 2006 ***{published data only}***
Zetta S, Jones M, Smith K. Randomised controlled trial comparing a self-help cognitive behavioural programme, the Angina Plan, with standard care for angina patients admitted to hospital [abstract]. *European Journal of Cardiovascular Nursing* 2006;**5**:S49–50.

References to ongoing studies

Beckie 2006 ***{published data only}***
Beckie TM. A behavior change intervention for women in cardiac rehabilitation. *Journal of Cardiovascular Nursing* 2006;**21**(2):146–53.

Burg 2007 ***{published data only}***
Burg M, Lespérance F, Rieckmann N, Clemow L, Skotzko C, Davidson K. Treating persistent depressive symptoms in post-ACS patients: The project COPES phase-I randomized controlled trial. Contemporary Clinical Trials 2007; Vol. epub, issue 5 Sept 2007.

CORE ***{published data only}***
The CORE Investigators. Design of a randomised controlled trial of comprehensive cardiac rehabilitation in patients with myocardial infarction, stabilized acute coronary syndrome, percutaneous transluminal coronary angioplasty or coronary artery bypass grafting: Akershus Comprehensive Cardiac Rehabilitation Trial (the CORE Study). *Current Controlled Trials in Cardiovascular Medicine* 2000;**1**:177–83.

Frasure 2006 ***{published data only}***
Frasure S, Koszycki D, Swenson J, Baker B, van Zyl LT, Laliberté Marc, et al.Design and rationale for a randomized, controlled trial of interpersonal psychotherapy and citalopram for depression in coronary artery disease (CREATE). *Psychosomatic Medicine* 2006;**68**(1):87–93.

Additional references

Beck 1961
Beck AT, Ward CH, Mendelson M, Mock J, Erbauch J. An inventory for measuring depression. *Archives of General Psychiatry* 1961;**4**:53.

Beck 1997
Beck AT. Cognitive Therapy: Reflections. In: Zeig JK editor(s). *The evolution of psychotherapy: The third conference*. New York: Brunner/Mazel, 1997.

BHF 2009
British Heart Foundation. Numbers dying from CVD and CHD. http://www.heartstats.org/datapage.asp?id=713 (accessed 16 December 2009).

Butler 2006
Butler A, Chapman J, Forman E, Beck A. The empirical status of cognitive-behavioral therapy: a review of meta-analyses. *Clinical Psychology Review* 2006;**26**(1):17–31.

Carney 2002
Carney RM, Freedland KE, Miller GE, Jaffe A. Depression as a risk factor for cardiac mortality and morbidity: a review of potential mechanisms. *Journal of Psychosomatic Research* 2002;**67**:S29–33.

Cochrane Heart Group 2003
Cochrane Heart Group. Preferred method for handling continuous variables. http://www.epi.bris.ac.uk/cochrane/stats3.html (accessed October 2003).

Cohen-Cole 1993
Cohen-Cole SA, Brown FW, McDaniel JS. Assessment of depression and grief reaction in the medically ill. In: Stoudemire A, Fogel BS editor(s). *Psychiatric Care of the Medical Patient*. London: Oxford University Press, 1993: 53-71.

DeBusk 1994b
DeBusk RF, Miller NH, Superko R, Dennis CA, Thomas RJ, Lew HT, et al.A case-management system for coronary risk factor modification after acute myocardial infarction. *Annals of Internal Medicine* 1994;**120**:721–9.

Dickersin 1994
Dickersin K, Scherer R, Lefebve C. Identifying relevant studies for systematic reviews. *BMJ* 1994;**309**:1286–91.

DSSI/sAD 1976
Bedford A, Foulds GA, Sheffield BF. A new personal disturbance scale (DSSI/sAD). *British Journal of Social and Clinical Psychology* 1976;**15**:387–94.

Egger 1997
Egger M, Davey Smith G, Schneider M, Minder C. Bias in meta-analysis detected by a simple graphical test. *BMJ* 1997;**315**:629–34.

Follmann 1992
Follmann D, Elliot P, Suh I, Cutler J. Variance imputation for overviews of clinical trials with continuous response. *Journal of Clinical Epidemiology* 1992;**45**:769–73.

HADS 1983
Zigmond AS, Snaith RP. The hospital and anxiety depression scale. *Acta Psychiatrica Scandinavica* 1983;**67**: 361–70.

Halaris 2009
Halaris A. Comorbidity between depression and cardiovascular disease. *International Angiology* 2009;**28**(2): 92–9.

HAM-D 1988
Williams JBW. A structured interview for the Hamilton Depression Rating Scale. *Archives of General Psychiatry* 1988;**45**:742–7.

Hersen 2004
Hersen M, Hilsenroth MJ, Segal DL. *Comprehensive Handbook of Psychological Assessment*. John Wiley and Sons, 2004.

Higgins 2011
iggins JPT, Altman DG, Sterne JAC (editors). Chapter 8: Assessing risk of bias in included studies. In: Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Jacobson 1996
Jacobson NS, Dobson KS, Truax PA, Addis ME, Koerner K, Gollan JK, et al.A component analysis of cognitive-behavioral treatment for depression. *Journal of Consulting and Clinical Psychology* 1996;**64**(2):295–304.

Kuper 2009
Kuper H, Nicholson A, Kivimaki M, Aitsi-Selmi A, Cavalleri G, Deanfield JE, et al.Evaluating the causal relevance of diverse risk markers: horizontal systematic review. *BMJ* 2009;**339**:b4265.

Lefebvre 1996
Lefebvre C, McDonald S. Development of a sensitive search strategy for reports of randomised controlled trials in EMBASE. Paper presented at the Fourth International Cochrane Colloquium, 20-24 Oct; Adelaide, Australia. 1996.

Lesperance 2000
Lespérance F, Frasure-Smith N. Depression in patients with cardiac disease: a practical review. *Journal of Psychosomatic Research* 2000;**48**:379–91.

Lim 1993
Lim LL, Valenti LA, Knapp JC, Dobson AJ, Plotnikoff R, Higginbotham N, et al.A self-administered quality-of-life questionnaire after acute myocardial infarction. *Journal of Clinical Epidemiology* 1993;**46**(11):1249–56.

Linden 2007
Linden W, Phillips MJ, Leclerc J. Psychological treatment of cardiac patients: a meta-analysis. *European Heart Journal* 2007;**28**(24):2972–84.

Meichenbaum 1985
Meichenbaum D. *Stress Inoculation Training*. New York: Pergamon, 1985.

MIVE 1996
Meesters C, Appels A. An interview to measure vital exhaustion. I. development and comparison with the Maastricht questionnaire. *Psychology & Health* 1996;**11**(4): 557–71.

MQ 1987
Appels A, Höppener P, Mulder P. A questionnaire to assess premonitory symptoms of myocardial infarction. *International Journal of Cardiology* 1987;**17**(1):15–24.

SCL-90-R 1983
Derogatis LR. *SCL-90-R: administration, scoring and procedures manual - II, for the R (evised) version and other instruments of the psycopathology rating scale series*. 2nd Edition. Towson Md: Clinical Psychometric Research, 1983.

STAI 1970
Spielberger C, Gorsuch R, Lushene R. *STAI Manual*. Palo Alto: Consulting Psychologists Press Inc, 1970.

STAXI 1985

Spielberger CD, Johnson EH, Russell SF, Crane RJ, Jacobs GA, Worden J. The experience and expression of anger: Construction and validation of an anger expression scale. In: MA Chesney, RH Rosenman editor(s). *Anger and Hostility in Cardiovascular and Behavioural Disorders*. Washington, DC: Hemisphere, 1985.

Taylor 1953

Taylor JA. A personality scale of manifest anxiety. *Journal of Abnormal and Social Psychology* 1953;**48**:285–90.

Welton 2009

Welton NJ, Caldwell DM, Adamopoulos E, Vedhara K. Mixed treatment comparison meta-analysis of complex interventions: psychological interventions in coronary heart disease. American Journal of Epidemiology (in press).

Zung 1965

Zung WWK. A self-rating depression scale. *Archives of General Psychiatry* 1965;**12**:63–9.

References to other published versions of this review

Rees 2004

K Rees, P Bennett, R West, S Davey, S Ebrahim. Psychological interventions for coronary heart disease. *Cochrane Database of Systematic Reviews* 2004, Issue 2. [DOI: 10.1002/14651858.CD002902.pub2]

* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Appels 2005

Methods	RCT
Participants	*Indication*: Patients who were exhausted after PCI, assessed via the Maastrict Questionnaire (MQ 1987; cut off of 14) and the Maastrict Interview for Vital Exhaustion (MIVE 1996; cut off of seven positive responses). *Psychopathology*: Approx 14% of the sample had major depression on entry. *Sampling*: 4159 patients potentially eligible, 727 patients randomised; mean age: 53.4 years; 77% men
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Exhaustion, stress, anxiety, type-A behaviours. *Components*: Relaxation, client-led discussion, empathy and social support; also some self-monitoring/self awareness and individually-tailored relaxation *Dose*: 28 hours contact **Control** Standard care including comprehensive cardiac rehabilitation
Outcomes	Revascularisation (CABG+PCI) Quality of Life (MacNew Heart Disease Heath-Related Quality of Life Questionnaire, Lim 1993) Also reported: Exhaustion (MQ 1987)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Used a 'computerised random number generator'. Groups were unbalanced for sex and HRQL score
Allocation concealment (selection bias)	Unclear risk	Once a block of 12 qualifying patients was formed, participants were randomized to the intervention group or the usual-care control group individually by a computerized random-number generator maintained in the EXIT coordination center (Maastricht). Treatment assignment was never unmasked by previous assignments to avoid selection bias that results from research staff being able to predict the next treatment assignment
Incomplete outcome data (attrition bias) All outcomes	Low risk	All treatment group comparisons were based on intention-to-treat approach principles. All patients allocated to the intervention group were included in the analyses, irrespective of their

Appels 2005 (*Continued*)

		compliance. Missing values at six and 18 months were replaced by the last observed value
Selective reporting (reporting bias)	High risk	Data on clinical diagnosis of depression are mentioned in the protocol as having been collected at baseline and 18 months, but 18 month comparisons not reported - it is not clear whether the authors considered depression as an outcome. 6 Month Exhaustion data not reported
Assessment blinding	Unclear risk	Morbidity results were obtained by an assessor blinded to group assignment; not clear for interview outcomes

Black 1998

Methods	RCT
Participants	*Indication*: Acute CHD events (MI, revascularisation, angina), patients randomised within 3 months of initial hospital stay *Psychopathology*: All patients met a threshold Global Severity Index of the SCL-90-R 1983 (63+). *Sampling*: 396 patients eligible, 60 patients randomised; mean age: 60.2 years; 88% men
Interventions	**Intervention** *Modality*: Individual treatment with clinical psychologist. Unclear whether family included *Treatment targets:* Behaviour change, stress management, anxiety, depression, and type-A behaviour *Components*: Guidance on behaviour change, relaxation, cognitive challenge/restructuring *Dose*: four hours contact time (median) **Control** Comprehensive Cardiac Rehabilitation
Outcomes	Anxiety (distress/GSI from the SCL-90-R 1983; 21 months) Depression (subscale from SCL-90-R 1983; 21 months) Also reported: Clinical events (total mortality, MI, CABG, PTCA combined)
Notes	Contacted authors for breakdown of clinical events and depression scores and GSI at baseline and 12 months (no response)

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Stated that the patients were randomly allocated. No further details

Black 1998 (*Continued*)

Allocation concealment (selection bias)	Unclear risk	No details provided.
Incomplete outcome data (attrition bias) All outcomes	Low risk	-
Selective reporting (reporting bias)	Unclear risk	Yes
Assessment blinding	Unclear risk	-

Brown 1993

Methods	RCT
Participants	MI or CABG within 4-24 months. Identified levels of psychopathology as selection criteria, threshold - 13+ on the Beck Depression Scale, or 70+ on the global severity index. 54 patients randomised, mean age 60.7, 54% men. Patients were older, and there were more women in the intervention group. Patients recruited from CR departments, newspapers and ads
Interventions	Includes stress management intervention. Complex psychological intervention. Intervention included relaxation, cognitive restructuring, assertion anger management and time management, administered by clinical psychologist and psychiatrist. One group session of one hour per week, for 12 weeks. Partners were also trained to give positive feedback and reinforcement. Control group had time with therapists where they received non-specific treatment effects of encouragement and reassurance, excluding key behaviour therapies. Follow-up 15 months
Outcomes	Anxiety, depression.
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	-
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	-
Selective reporting (reporting bias)	Unclear risk	-
Assessment blinding	Unclear risk	-

Burell 1996a

Methods	Multicentre RCT. Block randomisation.
Participants	*Indication*: CABG patients, randomised 3-12 months post surgery. *Psychopathology*: None identified *Sampling*: 261 patients randomised, mean age 57.5 years, 86% men.
Interventions	**Intervention** *Modality*: Group sessions *Treatment targets:* Risk education, disease adjustment, type A behaviour; also some attention paid to anxiety and depression *Components*: Risk information, guidance on behaviour change, self-awareness/monitoring, relaxation, homework *Dose*: 51 contact hours in year 1, plus 5-6 booster sessions in years 2 and 3 **Control** Usual care; rehabilitation programmes may have been routinely available to some but not all participants in both treatment and control groups
Outcomes	Total and cardiac mortality, Non-fatal MI, CABG (re-operation), PTCA, Self reported type A behaviour
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	States participants were randomly assigned.
Allocation concealment (selection bias)	Unclear risk	No information.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Insufficient information to judge, attrition appears to be zero
Selective reporting (reporting bias)	Unclear risk	Method does not fully specify the measures used.
Assessment blinding	Unclear risk	No information.

Burgess 1987

Methods	RCT
Participants	*Indication*: Acute MI, intervention started 1 week predischarge. *Psychopathology*: No identified levels of psychopathology prior to intervention *Sampling*: 235 patients potentially eligible, 180 patients randomised, mean age 51 years, 85% men

Burgess 1987 (*Continued*)

Interventions	**Intervention** *Modality*: Individual, administered by trained nurse clinicians during home visits *Treatment targets:* Disease adjustment, anxiety and depression. *Components*: Cognitive challenge/restructuring and social support; also some client led discussion *Dose*: Insufficient information to calculate contact hours. Each patient received an average of 2.77 visits over a 3 month period **Control** Some patients in both groups also received CCR, but this was limited in scope as recently developed
Outcomes	Total mortality Anxiety (Taylor 1953) Depression (Zung 1965)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No details.
Allocation concealment (selection bias)	Unclear risk	Randomisation was conducted by telephone from the study's central office; stratified by sex. Research assistant opened sealed envelopes
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	Insufficient detail provided.

Claesson 2005

Methods	RCT
Participants	*Indication*: Woman younger than 80 years with first or recurrent AMI, or who had been subjected to coronary angioplasty or CABG surgery, or had angina pectoris with CAD confirmed by angiography and treated non-invasively *Psychopathology*: None identified. *Sampling*: 255 patients potentially eligible, 198 patients randomised; mean age: 60.5 years; 0% men

Claesson 2005 (*Continued*)

Interventions	**Intervention** *Modality*: Group *Treatment targets:* Risk eduction, stress, anxiety, depression. *Components*: Coronary risk information, self-monitoring/awareness, relaxation, cognitive challenge/restructuring; also some guidance on behaviour change *Dose*: 40 hours contact. Twenty, two-hour sessions over the course of 1 year **Control** Usual medical care plus some risk information literature.
Outcomes	Total mortality Non fatal MI Revascularisation Depression Also reported: Exhaustion QoL Self-rated stress behaviour
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Randomisation was stratified by geographical areas, but no mention is made of the method used to generate the sequence
Allocation concealment (selection bias)	Low risk	"Randomisation was by sealed envelopes"
Incomplete outcome data (attrition bias) All outcomes	Low risk	For continuous outcomes, intention to treat was not performed because follow up data not available for 27 women who withdrew; however, drop-outs and reasons were provided
Selective reporting (reporting bias)	Low risk	Analyses provided for all outcomes mentioned in methods (and protocol). Data only provided as figures, and not in tabular/numerical form
Assessment blinding	Unclear risk	Blinding of assessors not described.

Cowan 2001

Methods	RCT
Participants	*Indication*: Survivors of out of hospital VF or asystole. *Psychopathology*: None identified *Sampling*: 133 patients randomised, 73% men, no age given.

Cowan 2001 (*Continued*)

Interventions	**Intervention** *Modality*: Individual *Treatment targets:* Stress, anxiety and depression. *Components*: Risk education, self awareness/monitoring, relaxation, cognitive challenge/ restructuring, social support. Also some guidance on behaviour change *Dose*: 16.5 hours contact time; 11 sessions of 90 minutes, two sessions per week **Control treatment** Usual medical care
Outcomes	Total and cardiac mortality Non-fatal MI
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	-
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	-
Selective reporting (reporting bias)	Unclear risk	-
Assessment blinding	Unclear risk	-

Elderen 1994

Methods	RCT. Block randomisation.
Participants	*Indication*: Acute MI, patients randomised before hospital discharge. *Psychopathology*: None identified *Sampling*: 60 patients randomised, 82% men, mean age 57 years.
Interventions	**Intervention** *Modality*: Individual counselling whilst in hospital, plus two group sessions and telephone follow up *Treatment targets:* Risk education and behaviour change; also attention paid to disease adjustment, anxiety and depression *Components*: Risk information, guidance on behaviour change, self awareness/monitoring, client led discussion; also some emotional support *Dose*: Insufficient information to calculate contact time. 2 in-hospital counselling sessions, 2 x 90 minute group sessions, plus average of 8 weekly follow up calls

	Control treatment Usual medical care	
Outcomes	Smoking, anxiety and depression.	
Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	Alternate allocation - in a two-week period all patients admitted to the hospital for a MI were invited to participate and were assigned to the experimental condition; in a subsequent two-week period all patients admitted to the hospital for a MI were assigned to the control condition
Allocation concealment (selection bias)	High risk	-
Incomplete outcome data (attrition bias) All outcomes	High risk	Drop outs in each group accounted for, but results not based on ITT
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	Insufficient information provided.

ENRICHD 2000

Methods	Multicentre RCT
Participants	*Indication*: Patients recovering from acute MI *Psychopathology*: Inclusion criteria required patients to have depression and/or low perceived social support. 73% of patients met criteria for depression or depression + low perceived social support *Sampling*: 33,780 patients identified as potentially eligible; 2481 patients were randomised, 66% men, mean age 61 years
Interventions	**Intervention** *Modality*: Individual and group therapy. *Treatment targets:* Depression (and low social support). Also some attention paid to behaviour change, disease adjustment, stress, anxiety, type-A behaviours and exhaustion *Components*: Guidance on behaviour change, cognitive challenge/restructuring, homework. Also some self awareness/monitoring, relaxation, client led discussion, emotional support *Dose*: 18.44 hours contact. Median number of individual session (1 hour) = 1; 31% of patients also received 12 two-hour group sessions **Control treatment**

ENRICHD 2000 (*Continued*)

	Referral to cardiac rehabilitation/support groups by patients own physician was considered to be usual care, and was available for both intervention and control patients
Outcomes	Total and cardiac mortality Non-fatal MI Depression (Beck 1961) QoL
Notes	Patients in the intervention group meeting criterion for depression were offered antidepressant pharmacotherapy (sertaline hydrochloride) donated by the manufacturer, and provided without charge. Alternative medications were offered where clinically appropriate. Pharmacotherapy was allowed for control group patients, but patients had to seek diagnosis and treatment from their own physician

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Stratified by clinical center and used a permuted block algorithm
Allocation concealment (selection bias)	Low risk	Study coordinators obtained treatment allocation using automated telephone randomization system maintained at the ENRICHD 2000 Coordingating Center.
Incomplete outcome data (attrition bias) All outcomes	Low risk	"All treatment group comparisons were based on the intention-to-treat principle that includes all randomized patients as randomized."
Selective reporting (reporting bias)	Low risk	
Assessment blinding	Low risk	All staff who collected, verified, or classified end point data or follow-up assessments were masked as much as possible

Gallacher 1997

Methods	RCT
Participants	*Indication*: Angina patients identified from 30 GP registers, prescribed nitrates or Ca2+ antagonists *Psychopathology*: None identified. *Sampling*: 452 patients randomised, all men.
Interventions	**Intervention** *Modality*: Group sessions with psychologist *Treatment targets:* Stress reduction *Components*: Relaxation and homework assignments, plus some self-monitoring/awareness and client led discussion

Gallacher 1997 (*Continued*)

	Dose: 3 hours. Three group sessions of 1 hour duration, with 4 and 6 weekly intervals, plus homework **Control treatment** Usual medical care
Outcomes	Stress Also reported: Blood pressure Smoking Lipid levels
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Stated that the patients were randomly allocated in a factorial design which included 8 groups (of which 4 reported in this study)
Allocation concealment (selection bias)	Unclear risk	"Randomisation was achieved with 8 envelopes"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	"All analyses followed the 'intention to treat' principle as far as the follow up data allowed"
Selective reporting (reporting bias)	Low risk	
Assessment blinding	Unclear risk	Insufficient information.

HofmanBang 1999

Methods	RCT
Participants	*Indication*: PTCA patients, 1-2 weeks post surgery. *Psychopathology*: None identified *Sampling*: 151 patients potentially eligible, 93 patients randomised, mean age 53 years, 84% men
Interventions	**Intervention** *Modality*: Group and individual *Treatment targets:* Risk education, behaviour change, stress, type-A behaviours, also anxiety *Components*: Risk information, guidance on behaviour change, self-awareness/monitoring, relaxation; also some homework *Dose*: Insufficient detail to calculate contact time. Intervention administered during a 4 week residential stay, and continued with regular follow up checks **Control treatment**

HofmanBang 1999 (*Continued*)

	Usual medical care
Outcomes	Total mortality Non-fatal MI, CABG + PTCA Anxiety (STAI 1970) Depression (Beck 1961) Anger (STAXI 1985) Also reported: Smoking Lipid levels,
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Stated that the patients were randomly allocated to the intervention and the control groups. No further information on how adequate it is
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	Insuffiient information.

Ibrahim 1974

Methods	Block randomised RCT
Participants	*Indication*: Patient post MI *Psychopathology*: None identified *Sampling*: 140 patients potentially eligible, 118 patients randomised in blocks of 12 to intervention or control. Allocation was alternate. Patients 35-65 years, mean age not stated (weighted mean of n reported in each bin, 51.7 years), 90% men
Interventions	**Intervention** *Modality*: Group sessions with clinical psychologist *Treatment targets:* Disease adjustment, stress; also some attention on anxiety, type-A behaviours, exhaustion, depression *Components*: Client led discussion, emotional support; also some self-awareness/monitoring *Dose*: 73.5 contact hours. Weekly 1.5 hour sessions, with average of 49 sessions per group

Ibrahim 1974 (*Continued*)

	Control treatment Usual medical care
Outcomes	Total mortality
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	Alternate allocation - the first 12 patients formed a therapy group. The subsequent 12 formed the control group and did not receive psychotherapy. This systematic allocation of groups of patients was repeated until five therapy and five control groups were formed
Allocation concealment (selection bias)	High risk	-
Incomplete outcome data (attrition bias) All outcomes	Low risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	Insufficient information.

Jones 1996

Methods	Multicentre RCT
Participants	*Indication*: Acute MI. Patients randomised at hospital discharge. *Psychopathology*: None identified *Sampling*: 2328 patients randomised, no age restriction, 73% men.
Interventions	**Intervention** *Modality*: Individual and group sessions with clinical psychologists and health visitors *Treatment targets:* Risk education, disease adjustment, stress, anxiety, depression *Components*: Risk information, self-awareness/monitoring, relaxation, client-led discussion, *Dose*: 14 contact hours; 7 sessions each 2 hours. **Control** Usual medical care.
Outcomes	Total mortality Non-fatal MI CABG/PTCA Anxiety (STAI 1970) Depression (DSSI/sAD 1976)

Jones 1996 (*Continued*)

	Also reports: Non-fatal stroke
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Only states that patients were randomised.
Allocation concealment (selection bias)	Low risk	Patients randomised by a study coordinating centre, with knowledge only of the date of admission and eligibility for discharge, and not any prognostic factors
Incomplete outcome data (attrition bias) All outcomes	Low risk	
Selective reporting (reporting bias)	Low risk	
Assessment blinding	Low risk	Interviewers were blind to treatment status.

Koertge 2008

Methods	RCT
Participants	*Indication*: Acute MI, PTCA or CABG *Psychopathology*: None identified *Sampling*: 387 patients potentially eligible, 247 patients randomised, mean age 62 years, 0% male
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Stress; also some attention to risk education, disease adjustment, anxiety, type-A behaviour, exhaustion, depression *Components*: Risk information, self-awareness/monitoring, relaxation, cognitive challenge/restructuring, homework *Dose*: 40 contact hours **Control treatment** Usual medical care
Outcomes	Total mortality Depression (Beck 1961) Also reported: Exhaustion (MQ 1987)
Notes	

Koertge 2008 (*Continued*)

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	A random number table was used to create group assignments.
Allocation concealment (selection bias)	Low risk	"A person not in contact with patients allocated them to [condition]? the result of the procedure was kept in sealed envelopes and given to the patients by research nurses
Incomplete outcome data (attrition bias) All outcomes	Low risk	All missing data adequately accounted for, and similar numbers of participants were missing from control and treatment groups
Selective reporting (reporting bias)	Low risk	All outcomes mentioned in the methods fully reported.
Assessment blinding	Low risk	The person entering patients' data [paper based questionnaires] in the computer had no knowledge about the study

Mayou 2002

Methods	RCT
Participants	*Indication*: First or second MI *Psychopathology*: Depression and anxiety measured at baseline (HADS 1983), but not used as an exclusion/inclusion criteria. Proportion meeting a clinical threshold not reported *Sampling*: 128 patients potentially eligible, 114 patients randomised, mean age 58.2 years, 78% male
Interventions	**Intervention** *Modality*: Individual *Treatment targets:* Risk education, behaviour change, disease adjustment; also attention paid to anxiety and depression *Components*: Risk education, guidance on behaviour change, relaxation; also some client led discussion *Dose*: Average 2.43 contact hours. **Control treatment** Standard coronary risk information.
Outcomes	QoL Also reported: Anxiety and Depression combined score.
Notes	
Risk of bias	

Mayou 2002 (*Continued*)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number tables.
Allocation concealment (selection bias)	Low risk	Following completion of the baseline assessment, patients were randomised by the research nurse using a system of opaque sealed envelopes prepared by the use of random number tables
Incomplete outcome data (attrition bias) All outcomes	Low risk	"throughout, an intention-to-treat approach was adopted". All dropouts reported. For dichotomous outcomes, a conservative analysis was conducted with missing data counted as poor outcomes
Selective reporting (reporting bias)	Unclear risk	All outcomes fully reported. However, no numerical data provided for the combined type-A measure (only subscales, of which some were and some were not significantly different)
Assessment blinding	Unclear risk	Research nurses (distinct from treatment team) took baseline measures, but follow up scores obtained via postal questionnaires, and not clear how these were handled

McLaughlin 2005

Methods	RCT
Participants	*Indication*: Hospitalised with ACS *Psychopathology*: Inclusion criteria of score >6 on either sub scale of the HADS 1983 *Sampling*: 700 patients potentially eligible, 100 randomised, mean age 60.2 years, 67% male
Interventions	**Intervention** *Modality*: Individual *Treatment targets:* Disease adjustment; also some attention to anxiety, depression *Components*: Guidance on behaviour change, self-awareness/monitoring; also some cognitive challenge/restructuring, client led discussion, emotional support and homework *Dose*: 3 contact hours **Control treatment** Risk information literature
Outcomes	Total mortality Depression (HADS 1983) Anxiety (HADS 1983) Also reported: Home and work limitations Clinical Global Impressions Scale of self-rated health

McLaughlin 2005 (*Continued*)

Notes	A significant decrease was found in depression scores, but mean baseline scores in the intervention group were 2 points higher, indicating a potential selection bias

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Coin flip
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	"Statistical analyses consisted of descriptive and intent to treat modelling procedures"
Selective reporting (reporting bias)	High risk	Anger (STAXI 1985) mentioned in the methods, but outcome data not reported.
Assessment blinding	Low risk	Baseline and follow up measures were obtained via an interactive telephone system

Michalsen 2005

Methods	RCT
Participants	*Indication*: Documented CAD *Psychopathology*: None identified *Sampling*: 235 patients potentially eligible, 105 patients randomised, mean age 59.4 years, 77% male
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Stress; also some attention paid to behaviour change *Components*: Risk information, guidance on behaviour change, self-awareness/monitoring, relaxation, cognitive challenge/restructuring, emotional support *Dose*: 96 hours contact time **Control** Standard coronary risk information plus usual medical care
Outcomes	Total mortality Revascularisation Depression (Beck 1961) Anxiety (STAI 1970) QoL (SF-36 Physical/Mental subscales) Anger (STAXI 1985; reports sub scales separately) Also reported: Perceived stress

Michalsen 2005 (*Continued*)

Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Central computer generated random assignments.
Allocation concealment (selection bias)	Unclear risk	"Randomization assignments were made by a central computer" but no mention made of concealment of allocation from investigators, e.g. during enrolment
Incomplete outcome data (attrition bias) All outcomes	Low risk	"Analyses included all patients for whom data were available at follow-up (per protocol-analysis)." Missing patients and reasons noted per-group
Selective reporting (reporting bias)	Low risk	Data presented for all measures mentioned in the methods section
Assessment blinding	Unclear risk	No mention made of how self report outcome assessments were collected and coded for analysis

Oldenburg 1985

Methods	RCT Block randomisation.
Participants	Patients following first acute MI over a 12 month period. No identified levels of psychopathology prior to intervention. 46 patients randomised, mean age 56 years 89% men
Interventions	Includes stress management intervention. Complex psychological intervention. Patients randomised to 3 groups: group 1 - individual counselling, relaxation training and education; group 2 - relaxation training and education; control - routine medical care. Counselling group received 6-10 sessions of 45 Min duration whist in hospital, within 48 hours of admission. Audiotapes were given for relaxation training (progressive muscular relaxation, breathing, cognitive tension awareness) and education (including how to modify type A behaviour). Follow up - 12 months
Outcomes	Total mortality, cardiac surgery and Heart attack Inventory (including GHQ, Spielberger State Anxiety)
Notes	Requested baseline and follow-up mean data and SDs for Heart Attack Inventory
Risk of bias	

Oldenburg 1985 (*Continued*)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Alternative allocation of all patients in each month of the study
Allocation concealment (selection bias)	High risk	-
Incomplete outcome data (attrition bias) All outcomes	Low risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	However, states therapists were not involved in any of the data collection

Peng 2005

Methods	RCT
Participants	*Indication*: Mix of MI, angina, arrhythmia, and heart failure. All recruited as in-patients *Psychopathology*: None identified
Interventions	**Intervention** *Components*: Psychotherapeutic approach included relaxation, emotional support, and cognitive-behavioural exercises in recognising unhealthy thought patterns and behaviours **Control treatment** Usual care
Outcomes	Depression, anxiety, cardiac events.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	-
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	High risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	-

Rahe 1979

Methods	RCT
Participants	*Indication*: First MI, approx 1 month after hospital discharge *Psychopathology*: None identified *Sampling*: 44 patients randomised, 89% men, mean age 53 years
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Risk education; also attention to behaviour change *Components*: Risk information, client led discussion; also some guidance on behaviour change *Dose*: 9 contact hours; 90 minute sessions every fortnight for 12 weeks **Control** Usual medical care
Outcomes	Total mortality Non-fatal MI Revasularisation (CABG)
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Stated that the patients were randomly allocated; no further details
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	High risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	-

RCCP 1982

Methods	RCT Patients randomised 2:1 to the intervention and comparison groups
Participants	*Indication*: MI within 6 months. *Psychopathology*: None identified *Sampling*: 862 patients randomised, 92% men, mean age 53 years.
Interventions	**Intervention** *Modality*: Individual (in addition to group sessions received by all patients) *Treatment targets:* Behaviour change, disease adjustment, stress, type-A behaviours

RCCP 1982 (*Continued*)

	Components: Guidance on behaviour change, self-awareness/monitoring, relaxation, cognitive challenge/restructuring, homework *Dose*: 57 contact hours **Control** Risk factor counselling in fortnightly group sessions for 3 months; usual medical care
Outcomes	Cardiac mortality Non-fatal MI Also reported: Type A behaviour
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomization, using a table of random numbers, was conducted in a ratio of 2:1 to intervention and control group
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Low risk	"Analyses were conducted on an intention-to-treat basis"
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	Type A behavior was assessed by 1 interviewer blind to treatment status

Sebregts 2005

Methods	RCT
Participants	*Indication*: Confirmed diagnosis of AMI or CABG surgery *Psychopathology*: SCID data indicate 11.8% of the sample had major depression at baseline *Sampling*: 304 patients potentially eligible, 204 patients randomised, mean age 55.4 years, 86% male
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Risk education, behaviour change, stress, type-A behaviours *Components*: Risk education, guidance on behaviour change, relaxation, homework; also som self-awareness/monitoring, client led discussion *Dose*: 20 contact hours **Control**

Sebregts 2005 (*Continued*)

	CCR plus usual medical care
Outcomes	Total mortality Revascularisation (CABG+PTCA) Depression Also reported: Type-A behaviour Exhaustion
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	"To allocate men and women... a stratified randomization procedure was developed by a person not involved in the study." "Patients randomized to the intervention group had higher scores on ...BDI depression than the control group"
Allocation concealment (selection bias)	Low risk	The outcome of the [stratified] randomisation was put in a sealed envelope, and patients received this envelope after the baseline interview
Incomplete outcome data (attrition bias) All outcomes	Low risk	Analysis is ITT with dropouts reported for both groups
Selective reporting (reporting bias)	Low risk	All outcomes reported
Assessment blinding	Low risk	"The interviewers remained unaware of patient groups assignment"

Stern 1983

Methods	RCT Block randomisation.
Participants	Indication: Documented MI within past 6 weeks to 1 year. Psychopathology: Anxiety and depression used as inclusion criteria: Required anxiety score (Taylor 1953) of 19+, or depression score (Zung 1965) of 40+. Samping: 64 patients randomised. Patients aged 30-69 years (weighted average 53.15 years), 85% men
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Risk education, behaviour change, stress, type-A behaviours, *Components*: Risk information, guidance on behaviour change, relaxation, client-led discussion, homework; also some self-awareness/monitoring *Dose*: 13.5 contact hours

Stern 1983 (*Continued*)

	Control Usual medical care - patients were requested not to join and exercise programme or attend counselling
Outcomes	Total mortality Non-fatal MI, Revascularisation (CABG) Anxiety (Taylor 1953; data incomplete) Depression (Zung 1965; data incomplete)
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomly assigned in blocks of 6; no further detail provided
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	-
Selective reporting (reporting bias)	Low risk	-
Assessment blinding	Unclear risk	-

Van Dixhoorn 1999

Methods	RCT
Participants	*Indication*: Acute MI - patients randomised within 1 month of event. *Psychopathology*: None identified *Sampling*: 156 patients randomised, mean age 55.5 years, 94% men.
Interventions	**Intervention** *Modality*: Group *Treatment targets:* Stress *Components*: Relaxation, homework *Dose*: 6 contact hours **Control** Exercise plus usual medical care
Outcomes	Cardiac mortality Non-fatal MI Revascularisation

Van Dixhoorn 1999 (*Continued*)

Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Reported randomisation, but insufficient detail provided.
Allocation concealment (selection bias)	Unclear risk	-
Incomplete outcome data (attrition bias) All outcomes	Low risk	All the randomised 156 patients were included in the 2 year and 5 year follow up analyses
Selective reporting (reporting bias)	Unclear risk	-
Assessment blinding	High risk	-

RCT - randomised controlled trial
CHD - coronary heart disease
SM - stress management
MI - myocardial infarction
CABG - coronary artery bypass graft
PTCA - percutaneous transluminal angioplasty
GHQ - general health questionnaire
SD - standard deviation
HRQoL - health related quality of life
CCR - comprehensive cardiac rehabilitation
CHF - congestive heart failure
CCU - coronary care unit
VF - ventricular fibrillation
HR - heart rate
RR - respiratory rate
CV - cardiovascular
HE - health education

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
-Vestfold-Heartcare-Study-Group 2003	Not a psychological intervention; treatment included exercise
Allison 2000	Not a Psychological Intervention

(*Continued*)

Bagheri 2007	Follow-up too short (5 months)
Bay 2008	Intervention is cardiac rehabilitation including exercise
Bettencourt 2005	Exercise-based programme
Bishop 2005	follow-up too short and mixed patient group
Blumenthal 2005	follow-up too short (8 weeks)
Brodie 2008	Crossover trial in which control patients were offered treatment before the 9 month follow up (therefore, no outcomes > 6 months uncontaminated)
Buckley 2007	No useful outcomes
Burell 1996b	Not a RCT
Carson 1988	Follow-up too short (6 weeks)
Chen 2005	Follow-up too short (12 weeks)
Clark 2007	Mixed patient group including heart failure and cardiomyopathy
de-Klerk 2004	Follow-up too short (5 days)
DeBusk 1994a	Not a psychological intervention
del Pino 2005	Not a RCT
Dusseldorp 1999	Not a RCT
Erdman 1983	Not a psychological problem
Fang 2003	Follow-up too short (8 weeks); Unsuitable patient group
Focht 2004	Patients recruited for implantable cardioverter-defibrillator (ICD)
Frasure-Smith 1985	Not a psychological intervention
Frasure-Smith 1997	Not a psychological intervention
Fridlund 1991	Intervention included exercise
Friedman 1986	Not a RCT
Gallagher 2003	Follow-up too short (3 months)

(*Continued*)

Giannuzzi 2008	Not a psychological intervention
Goodman 2008	Follow-up too short (3 months)
Gruen 1975	Follow-up too short (4 months)
Gunnarsdottir 2007	Follow-up too short (3 months)
Gutschker 1982	Included exercise
Hardcastle 2008	Not a psychological intervention
Harting 2006	Mixed patient group including heart failure and CHD or two risk factors
Hattan 2002	Follow-up too short (4 weeks)
Higgins 2001	Interventions made by non-psychologically trained clergy
Izawa 2005	No useful outcomes
Jaarsma 2008	Not a psychological intervention
Jiang 2007	Intervention included exercise
Johansen 2003	Follow-up too short (12 weeks)
Johnston 1999	Staff not trained in psychological intervention
Jolly 1998	Not a psychological intervention
Kanji 2004	Follow-up too short (6 weeks)
Karlsson 2007	Intervention included exercise
King 1988	Not a RCT
Klein 2007	Follow-up too short (16 weeks)
Ku 2002	Intervention included many optional components; only 84% of patients selected the stress management component and no separate analyses reported for this group
Kummel 2008	Not a psychological intervention
Lahmann 2008	Patients recruited for hypertension only. Followup too short (4 months)
Lewin 2002	Not a psychological intervention

(*Continued*)

Lewin 2009	Patients recruited for non-specific chest pain
Lidell 1996	Intervention included exercise
Luszczynska 2006	No useful outcomes
Luszczynska 2007	No useful outcomes
MacIntyre 2008	Intervention delivered by nurses-no mention of psychological training
Mandel 2007	Mixed patient group including HF and stroke
Mandel 2008	Mixed patient group including arrhythmia, heart failure and valvular disease
Maroto 2005	Intervention delivered by cardiac nurses without specific training
McGillion 2008	Follow-up too short (5 months)
McHugh 2001	Staff not trained in psychological intervention
Mitsibounas 1992	No relevant outcomes
Mohiuddin 2007	Not a psychological intervention
Nordmann 2001	Not a psychological intervention
Novoa 2008	Follow-up too short (4 months)
Oldenburg 1995	Intervention included exercise
Oldridge 1995	Intervention included exercise
Ornish 1990	Intervention included exercise
Ornish 1998	Intervention included exercise
Parent 2000	Follow-up too short (16 weeks)
Paul 2006	Follow-up too short (12 weeks)
Petrie 2002	Follow-up too short (immediate post-intervention)
PRECOR Group 1991	Not a psychological intervention
Price 2004	Not a RCT
Pullen 2008	Not a RCT (case matched historical controls)

(*Continued*)

Quist 2003	Intervention is for smoking cessation
Reid 2003	Not a psychological intervention; treatment included exercise
Robert-McComb 2004	Follow-up too short (10 weeks)
Salminen 2005	Does not state whether staff were psychologically trained
Scholz 2006	Not a psychological intervention; treatment included exercise
Senuzun 2006	Follow-up too short (2 months) and no suitable outcomes
Seskevich 2004	Follow-up too short (4 months)
Sheps 2004	Not a RCT
Sinclair 2005	Exercise-based programme
Sniehotta 2006	Follow-up too short (1 month)
Stenlund 2005	No useful outcomes
Thompson 1989	Staff not trained in psychological intervention
Toobert 1998	Intervention included exercise
van Dixhoorn 1991	Not a RCT
van Dixhoorn, 1983	Followup period not stated - seems likely < 6 months. Authors contacted for clarification with no reply
van Elderen 2001	No mention of randomisation
Vermeulen 1983	Intervention included exercise
Wan 2005	Follow-up too short (8 weeks)
Wyer 2001	No useful outcomes
Xue 2008	Patients at risk of CHD (e.g. BMI > 28) of CHD, but no MI or procedure
Yeh 2008	Not a psychological intervention
Zeng 2001	Followup too short
Zhu 2006	Reports 12 month follow up data from a study excluded from original review (staff administering intervention were not trained)

Characteristics of studies awaiting assessment *[ordered by study ID]*

James 2006

Methods	RCT
Participants	40 CAD patients
Interventions	8 week psychosocial skills building/stress management
Outcomes	The following psychosocial variables were measured pre- and post-intervention: hostility, by the Cook-Medley Hostility Scale (Ho); anger, by the State-Trait Anger Expression Inventory - 2 (STAXI-2); depression, by the Center for Epidemiological Studies - Depression scale (CES-D); and social support, by the Interpersonal Support Evaluation List (ISEL). Levels of the inflammatory markers, high-sensitivity CRP (hsCRP), IL-6, and TNF-α, were also measured pre- and post-intervention
Notes	http://gradworks.umi.com/32/11/3211754.html

Zetta 2006

Methods	RCT
Participants	Angina patients
Interventions	"Angina plan" including relaxation, psychoeducation and goal setting/pacing
Outcomes	HADS, QoL, Angina symptoms
Notes	http://www.sdhi.ac.uk/Conference06/Zetta.ppt

Characteristics of ongoing studies *[ordered by study ID]*

Beckie 2006

Trial name or title	Gender-tailored cardiac rehabilitation vs standard cardiac rehabilitation
Methods	Randomised controlled trial
Participants	Women participating in a motivationally enhanced, gender-tailored cardiac rehabilitation program
Interventions	A gender-tailored, stage-of-change matched, behavioral enhancement using individualized motivational interviewing
Outcomes	Cardiovascular events, anxiety.
Starting date	

Beckie 2006 (*Continued*)

Contact information	Beckie TM. College of Nursing, University of South Florida, Tampa, Fla 33612-4766, USA. tbeckie@hsc.usf.edu
Notes	

Burg 2007

Trial name or title	THE PROJECT COPES PHASE-I RANDOMIZED CONTROLLED TRIAL
Methods	Multi-center Phase-I randomized clinical trial
Participants	Prospective study participants are identified through monitoring of hospital admissions for ACS diagnoses, and by subsequent examination of medical records after patients are admitted to coronary care units
Interventions	Problem Solving Therapy
Outcomes	1) BDI score, 2) number of adverse events, 3) percent adherence with aspirin, and 4) levels of inflammatory markers
Starting date	
Contact information	The Behavioral Medicine Research Group of the National Heart, Lung and Blood Institute is the project office
Notes	

CORE

Trial name or title	Akershus Comprehensive Cardiac Rehabilitation Trial (the CORE Study)
Methods	
Participants	RCT set in Akershus County, Oslo. 500 patients randomised, aged 40-85 years after MI, CABG, PTCA or stabilized acute coronary syndrome. Pragmatic trial - intervention offered to a heterogeneous group of patients
Interventions	Comprehensive cardiac rehabilitation including structured counselling to modify risk factors and brief counselling will be offered individually at 6 months
Outcomes	Special emphasis on the assessment of quality of life
Starting date	Originally states as April 2000 with follow up complete by April 2004. No sign of publication to date. Contacted author with no reply
Contact information	Study design described at http://cvm.controlled-trials.com/content/1/3/177
Notes	

Frasure 2006

Trial name or title	Controlled Trial of Interpersonal Psychotherapy and Citalopram for Depression in Coronary Artery Disease (CREATE)
Methods	Multisite RCT
Participants	Two hundred eighty stable CAD patients with a current major depressive episode of at least 4 weeks' duration, based on the Structured Clinical Interview for Depression (SCID), and who have a baseline score >19 on a centralized, telephone-administered, 24-item Hamilton Depression Rating Scale (HAM-D)
Interventions	Interpersonal psychotherapy/Citalopram (a 2-by-2 factorial design with four groups: IPT plus pill-placebo, IPT plus citalopram, CM plus pill-placebo, and CM plus citalopram)
Outcomes	Hamilton Depression; BDI
Starting date	
Contact information	Nancy Frasure-Smith, PhD, Montreal Heart Institute Research Center, 5000 Bélanger, Montreal, Quebec H1T 1C8, Canada. E-mail: nancy.frasure-Smith@mcgill.ca
Notes	

DATA AND ANALYSES

Comparison 1. Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Total Mortality	17	6852	Risk Ratio (M-H, Random, 95% CI)	0.89 [0.75, 1.05]
2 Cardiac Mortality	5	3893	Risk Ratio (M-H, Random, 95% CI)	0.80 [0.64, 1.00]
3 Revascularisation (CABG and PTCA combined)	12	6670	Risk Ratio (M-H, Random, 95% CI)	0.95 [0.80, 1.13]
4 Non-fatal MI	12	7534	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.67, 1.13]
5 Depression	12	5041	Std. Mean Difference (IV, Random, 95% CI)	-0.21 [-0.35, -0.08]
6 Anxiety	8	2771	Std. Mean Difference (IV, Random, 95% CI)	-0.25 [-0.48, -0.03]

Analysis 1.1. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 1 Total Mortality.

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome: 1 Total Mortality

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
Burell 1996a	7/128	16/133		0.45 [0.19, 1.07]
Burgess 1987	5/89	5/91		1.02 [0.31, 3.41]
Claesson 2005	0/101	0/97		0.0 [0.0, 0.0]
Cowan 2001	3/67	8/66		0.37 [0.10, 1.33]
ENRICHD 2000	169/1238	172/1243		0.99 [0.81, 1.20]
HofmanBang 1999	1/48	3/45		0.31 [0.03, 2.90]
Ibrahim 1974	5/58	9/60		0.57 [0.20, 1.61]
Jones 1996	76/1168	75/1160		1.01 [0.74, 1.37]
Koertge 2008	2/119	9/128		0.24 [0.05, 1.08]
Mayou 2002	3/58	2/56		1.45 [0.25, 8.34]
McLaughlin 2005	0/53	1/47		0.30 [0.01, 7.10]

(*Continued* . . .)

(. . . *Continued*)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
Michalsen 2005	0/48	0/53		0.0 [0.0, 0.0]
Oldenburg 1985	2/16	3/14		0.58 [0.11, 3.00]
Rahe 1979	0/22	3/22		0.14 [0.01, 2.61]
Sebregts 2005	1/106	0/98		2.78 [0.11, 67.34]
Stern 1983	0/35	1/29		0.28 [0.01, 6.57]
Van Dixhoorn 1999	7/76	11/80		0.67 [0.27, 1.64]
Total (95% CI)	**3430**	**3422**		**0.89 [0.75, 1.05]**

Total events: 281 (Treatment), 318 (Control)

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 14.29$, df = 14 (P = 0.43); $I^2 = 2\%$

Test for overall effect: Z = 1.37 (P = 0.17)

Test for subgroup differences: Not applicable

Analysis 1.2. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 2 Cardiac Mortality.

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome: 2 Cardiac Mortality

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Burell 1996a	5/128	8/133		4.3 %	0.65 [0.22, 1.93]
Cowan 2001	0/67	6/66		0.6 %	0.08 [0.00, 1.32]
ENRICHD 2000	96/1238	115/1243		76.0 %	0.84 [0.65, 1.09]
RCCP 1982	28/592	17/270		14.9 %	0.75 [0.42, 1.35]
Van Dixhoorn 1999	5/76	7/80		4.2 %	0.75 [0.25, 2.27]
Total (95% CI)	**2101**	**1792**		**100.0 %**	**0.80 [0.64, 1.00]**

Total events: 134 (Treatment), 153 (Control)

Heterogeneity: $Tau^2 = 0.0$; $Chi^2 = 2.98$, df = 4 (P = 0.56); $I^2 = 0.0\%$

Test for overall effect: Z = 1.94 (P = 0.053)

Test for subgroup differences: Not applicable

Analysis 1.3. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 3 Revascularisation (CABG and PTCA combined).

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome: 3 Revascularisation (CABG and PTCA combined)

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Appels 2005	82/366	68/344		23.9 %	1.13 [0.85, 1.51]
Burell 1996a	7/128	3/133		1.6 %	2.42 [0.64, 9.17]
Claesson 2005	1/101	1/97		0.4 %	0.96 [0.06, 15.14]
ENRICHD 2000	216/1238	230/1243		41.7 %	0.94 [0.80, 1.12]
HofmanBang 1999	13/48	17/45		7.5 %	0.72 [0.39, 1.30]
Jones 1996	47/1168	54/1160		15.7 %	0.86 [0.59, 1.27]
Michalsen 2005	2/48	2/53		0.8 %	1.10 [0.16, 7.54]
Oldenburg 1985	5/16	4/14		2.4 %	1.09 [0.36, 3.29]
Rahe 1979	1/22	4/22		0.7 %	0.25 [0.03, 2.06]
Sebregts 2005	9/106	9/98		3.6 %	0.92 [0.38, 2.23]
Stern 1983	4/35	0/29		0.4 %	7.50 [0.42, 133.78]
Van Dixhoorn 1999	2/76	11/80		1.3 %	0.19 [0.04, 0.84]
Total (95% CI)	**3352**	**3318**		**100.0 %**	**0.95 [0.80, 1.13]**

Total events: 389 (Treatment), 403 (Control)

Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 12.61$, df = 11 (P = 0.32); $I^2 = 13\%$

Test for overall effect: Z = 0.59 (P = 0.55)

Test for subgroup differences: Not applicable

Analysis 1.4. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 4 Non-fatal MI.

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome: 4 Non-fatal MI

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Risk Ratio M-H,Random,95% CI
Appels 2005	27/366	17/344		1.49 [0.83, 2.69]
Burell 1996a	2/128	8/133		0.26 [0.06, 1.20]
Claesson 2005	2/101	1/97		1.92 [0.18, 20.84]
Cowan 2001	1/67	2/66		0.49 [0.05, 5.30]
ENRICHD 2000	168/1238	170/1243		0.99 [0.81, 1.21]
HofmanBang 1999	0/48	1/45		0.31 [0.01, 7.49]
Jones 1996	43/1168	48/1160		0.89 [0.59, 1.33]
Rahe 1979	0/22	4/22		0.11 [0.01, 1.95]
RCCP 1982	41/592	33/270		0.57 [0.37, 0.88]
Sebregts 2005	0/106	0/98		0.0 [0.0, 0.0]
Stern 1983	3/35	1/29		2.49 [0.27, 22.64]
Van Dixhoorn 1999	10/76	12/80		0.88 [0.40, 1.91]
Total (95% CI)	**3947**	**3587**		**0.87 [0.67, 1.13]**

Total events: 297 (Treatment), 297 (Control)

Heterogeneity: $Tau^2 = 0.05$; $Chi^2 = 14.53$, df = 10 (P = 0.15); $I^2 = 31\%$

Test for overall effect: Z = 1.06 (P = 0.29)

Test for subgroup differences: Not applicable

Analysis 1.5. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 5 Depression.

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

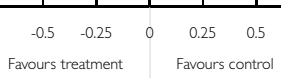
Outcome: 5 Depression

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Random,95% CI	Weight	Std. Mean Difference IV,Random,95% CI
Black 1998	30	-5.4 (9.68)	30	-0.2 (7.12)		4.8 %	-0.60 [-1.12, -0.09]
Burgess 1987	68	0.3 (7.511)	68	-0.3 (6.144)		8.1 %	0.09 [-0.25, 0.42]
Claesson 2005	80	-1.63 (9.0886)	86	-1.03 (7.3098529)		8.9 %	-0.07 [-0.38, 0.23]
ENRICHD 2000	916	-7.6 (8.8)	869	-4.7 (8.6)		15.0 %	-0.33 [-0.43, -0.24]
HofmanBang 1999	34	-2 (5.575)	32	-0.2 (7.05)		5.2 %	-0.28 [-0.77, 0.20]
Jones 1996	1060	-0.05 (2.85)	1068	-0.01 (2.98)		15.2 %	-0.01 [-0.10, 0.07]
Koertge 2008	87	-2.3 (5.0651752)	82	-1.8 (5.5801434)		8.9 %	-0.09 [-0.40, 0.21]
McLaughlin 2005	45	-2.4 (5.4275225)	35	0.1 (2.8719331)		5.8 %	-0.55 [-1.00, -0.10]
Michalsen 2005	48	-2.9 (4.7)	53	-2.2 (5.5)		6.9 %	-0.14 [-0.53, 0.26]
Peng 2005	71	-8.17 (8.01)	65	-4.93 (5.76)		8.0 %	-0.46 [-0.80, -0.12]
Sebregts 2005	83	-1.6 (4.9276769)	75	-0.6 (3.7849703)		8.6 %	-0.23 [-0.54, 0.09]
Stern 1983	31	-1.94 (6.6)	25	0.04 (6.2)		4.6 %	-0.30 [-0.83, 0.23]
Total (95% CI)	**2553**		**2488**			**100.0 %**	**-0.21 [-0.35, -0.08]**

Heterogeneity: $Tau^2 = 0.03$; $Chi^2 = 36.36$, df = 11 (P = 0.00015); $I^2 = 70\%$

Test for overall effect: Z = 3.11 (P = 0.0019)

Test for subgroup differences: Not applicable

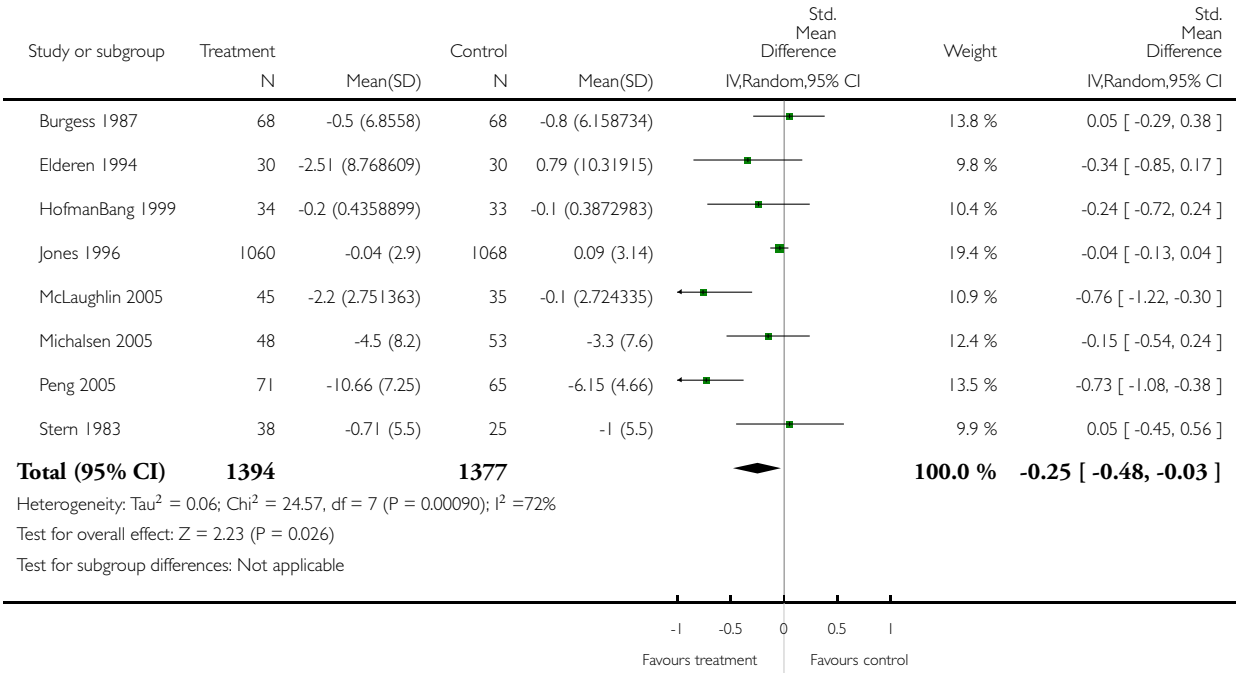


Analysis 1.6. Comparison 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation), Outcome 6 Anxiety.

Review: Psychological interventions for coronary heart disease

Comparison: 1 Psychological intervention +/- other rehabilitation vs control (usual care/other rehabilitation)

Outcome: 6 Anxiety



ADDITIONAL TABLES

Table 1. Results of univariate meta-regression

	Predictor	Total mortality exp(ß) (se) p	Depression ß (se) p	Variable coding
Intervention	Mode of treatment	1.247 (0.211) 0.217	-0.020 (0.074) 0.795	Group= 1; Individual= 2; Both= 3 (note, equivalent result obtained with dummy coding of group and individual treatment)
	Total treatment contact	0.998 (0.010) 0.342	0.002 (0.003) 0.371	Hours

Table 1. Results of univariate meta-regression (*Continued*)

	Treatment total duration	0.989 (0.010) 0.337	-0.001 (0.003) 0.749	Weeks
	Family included	1.130 (0.230) 0.560	**0.264** (0.074) 0.006	0/1; unclear = 0
	Treatment for disease adjustment	1.226 (0.347) 0.485	0.162 (0.141) 0.282	0/1; unclear = 0
	Treatment for depression	1.454 (0.482) 0.281	0.065 (0.146) 0.687	0/1; unclear = 0
	Treatment for anxiety	1.088 (0.334) 0.786	0.227 (0.138) 0.135	0/1; unclear = 0
	Treatment for stress	0.840 (0.253) 0.574	0.013 (0.168) 0.939	0/1; unclear = 0
	Treatment for 'type-A' behaviour	1.046 (0.328) 0.888	**-0.317** (0.125) 0.033	0/1; unclear = 0
	Treatment for exhaustion	0.237 (.367) 0.371	0.218 (0.447) 0.636	0/1; unclear = 0
	Included risk information	1.007 (0.740) 0.742	**0.234** (0.092) 0.029	0/1; unclear = 0
	Included guidance on behaviour change	0.954 (0.811) 0.955	-0.029 (0.151) 0.848	0/1; unclear = 0
	Included self-awareness/ monitoring	0.971 (0.283) 0.920	0.109 (0.174) 0.554	0/1; unclear = 0
	Included relaxation	0.977 (0.162) 0.894	0.163 (0.112) 0.178	0/1; unclear = 0
	Included cognitive challenge/restructuring	1.054 (0.170) 0.763	-0.059 (0.122) 0.642	0/1; unclear = 0
	Included client led discussion/emotional support	1.033 (0.197) 0.867	**0.307** (0.056) 0.001	0/1; unclear = 0
	Included homework	1.523 (0.398) 0.531	-0.026 (.141) 0.836	0/1; unclear = 0
Control	Usual care included CR	0.875 (0.391) 0.772	-0.189 (0.185) 0.335	0/0.5/1; 0.5 indicated CR may have been available for some patients
Patients	Age	1.028 (0.036) 0.445	-0.018 (0.014) 0.278	Mean years

Table 1. Results of univariate meta-regression (*Continued*)

	Gender	1.000 (0.006) 0.997	-0.002 (0.002) 0.590	% Male
	Time since diagnosis	0.101 (0.057) 0.894	0.000 (0.007) 0.888	Study mean weeks
	% patients with indication of MI	1.011 (0.013) 0.460	0.001 (0.003) 0.483	
	% patients with CABG or other revascularisation	1.001 (0.005) 0.816	0.000 (0.002) 0.674	
Study	Patients with psychopathology at baseline	1.292 (.297) 0.277	-.283 (.132) 0.065	0/0.5/1, None/Mixed/All
	Duration of follow up	0.996 (.004) 0.555	-0.004 (.005) 0.382	Months

Table 2. Health Related QoL Outcomes

Trial	Follow up (months)	Measure	Scores at follow up Mean (SD) vs Mean (SD) or † Difference (SD)	Between group difference
Appels 2005	18	MacNew Heart Disease Heath-Related QoL Questionnaire	126.9 (27.4) vs 127.1 (25.8), p = .91	Treatment > Control Treatment > Control
Claesson 2005	12	Swedish Quality of LIfe Scale	6.59 (2.951) vs 5.97 (3.153), p = .195	Treatment Control
ENRICHD 2000	6	SF-12 Physical Sum Score	† 0.8 (22.96), ns	Treatment Control
ENRICHD 2000	6	SF-12 Mental Sum Score	† 2.2 (18.3), p <.05	Treatment > Control
ENRICHD 2000	6	Life Satisfaction Scale	† 1.0 (9.8), p < .05	Treatment > Control
ENRICHD 2000	6	Ladder of life	† 0.3 (4.59), p < .05	Treatment > Control
HofmanBang 1999	24	AP-QLQ (total score)	4.7 (0.8) vs 4.3 (1.0), ns	Treatment Control
Mayou 2002	12	Dartmouth COOP	14 (13-17) vs 15 (12.5-21), p = .206†	Treatment Control
Michalsen 2005	12	SF-36 Physical Sum Score	43.2 (9.2) vs 46.1 (9.3), p = .122	Treatment Control

Table 2. Health Related QoL Outcomes (*Continued*)

Michalsen 2005	12	SF-36 Mental Sum Score	47.2 (9.2) vs 49.3 (10), p = .837	Treatment Control

† Median (IQR) and p value from Mann Whitney U test.

Table 3. Other psychological outcomes

Trial	Follow up (months)	Measure	Outcome values at follow up	Between group difference
Appels 2005	18	Depression (clinical diagnosis using DSM-IV criteria)	At intake, 58 patients (16%) of the intervention group and 43 patients (12%) of the control group were depressed (2 1.63; p . 20). At 18 months, 21 patients (6%) of the intervention group and 29 patients (8%) of the control group were depressed (2 1.96; p . 16)	Intervention reduced the odds of being depressed at 18 months by 50%, controlling for age, gender, and depression at intake (OR 0. 50; 95% CI 0.26-0.95; p . 04)
Claesson 2005	12	Stress: Self Rated Stress Behaviour	13.41 (12.52) vs 16.09 (15. 85), p = <.01	Treatment > Control
	12	Exhaustion: Maastricht Vital Scale	12.22 (17.26) vs 15.75 (19. 38), p = <.05	Treatment > Control
Koertge 2008	30	Exhaustion: Maastricht Vital Scale	16.5 (11.1) vs 16.9 (11.3), p = .005	Treatment > Control[1]
HofmanBang 1999	24	Anger: Expression (STAXI 1985)	22.2 (7.4) vs 22.5 (8.5), ns	Treatment Control
	24	Type A: Cynical distrust	2.3 (0.7) vs 2.7 (0.8), ns	Treatment Control
	24	Type A: HALTAM questionnaire (total)	4.5 (0.8) vs 4.5 (0.8), ns	Treatment Control
	24	Type A: Bortner index	4.8 (0.9) vs 4.8 (0.8), ns	Treatment Control
	24	Type A: Type A attitudes	1.2 (0.7) vs 1.3 (0.9), p = <.05	Treatment > Control
Mayou 2002	12	Hamilton Anxiety and Depression Combined Score	Median (IQR): 6 (2-9) vs 7 (4-11.5); Mean difference of -2.35	Treatment < Control

Table 3. Other psychological outcomes (*Continued*)

Michalsen 2005	12	Anger: STAXI 1985 State	10.9 (2.3) vs 11.1 (2.6), p = 0.851	Treatment Control
	12	Anger: STAXI 1985 Trait	17.4 (4.2) vs 18 (4.8), p = .178	Treatment Control
	12	Anger: STAXI 1985 In	17.1 (4.7) vs 16.8 (4.9), p = .831	Treatment Control
	12	Anger: STAXI 1985 Out	11.6 (2.7) vs 11.5 (3.1), p = .614	Treatment Control
	12	Anger: STAXI 1985 Control	24.5 (4.2) vs 24.4 (4.5), p = .501	Treatment Control
	12	Stress: Cohen Perceived Stress Score	19.1 (7.6) vs 21.7 (7.7), p = .117	Treatment Control
RCCP 1982	54	Type A: Videotaped Clinical Interview for Type A behaviour	15.5 (8.9) vs 22.1 (9.7), p = < .001	Treatment > Control
Sebregts 2005	9	Type A: Revised Videotaped Structured Interview (Hostility sub scale)	53.6 (25.3) vs 58.9 (29.5), p = .03	Treatment > Control
	9	Type A: Revised Videotaped Structured Interview (Time urgency sub scale)	66.5 (29.6) vs 75 (32.1), p = .01	Treatment > Control
	9	Type A: Revised Videotaped Structured Interview (Insecurity sub scale)	25.8 (20.6) vs 26.3 (22.6), p = .54	Treatment Control
	9	Exhaustion: Maastricht Vital Scale	4.6 (5.7) vs 4.7 (5.5), p = .2	Treatment Control

[1] The authors note in their discussion that "due to regression towards the mean we cannot attribute the decrease in VE to the intervention".

Table 4. Other clinical outcomes carried forward from the previous review

Outcome	Study	Details at Follow up (Intervention vs Control)	Between Group Difference	Notes	
Smoking	HofmanBang 1999	4 (46) vs 7 (41)	Treatment Control	Events (N)	

Table 4. Other clinical outcomes carried forward from the previous review (*Continued*)

	Jones 1996	260 (1168) vs 252 (1160)	Treatment Control	Events (N)	
Systolic Blood Pressure	Gallacher 1997	-4.6 (20.5) 216 vs -3.6 (20.3) 217	Treatment Control	Mean change (SD) N	
Diastolic Blood Pressure	Gallacher 1997	1.2 (13.5) 216 vs 2.7 (13.4) 217	Treatment Control	Mean change (SD) N	
Total Cholesterol	Gallacher 1997	-0.26 (0.8) 216 vs -0.21 (0.91) 217	Treatment Control	Mean change (SD) N	
	HofmanBang 1999	-0.2(0.67) 44 vs -0.5 (0.75) 36	Treatment Control	Mean change (SD) N	
LDL Cholesterol	HofmanBang 1999	-0.2 (0.67) 44 vs- 0.4 (0.67) 36	Treatment Control	Mean change (SD) N	
HDL Cholesterol	Gallacher 1997	-0.01 (0.24) 216 vs -0.06 (0.22) 217	Treatment < Control	Mean change (sd) N	
Triglycerides	HofmanBang 1999	-0.4 (1.31) 44 vs -0.6 (0.96) 36	Treatment Control	Mean change (sd) N	

Note, physiological outcomes were not extracted from studies identified for the update review.

APPENDICES

Appendix 1. Search Strategy 2001

CCTR search strategy

MYOCARDIAL-ISCHEMIA*:ME
CORONARY-ARTERY-BYPASS*:ME
(ISCHEMI* near HEART)
(ISCHAEMI* near HEART)
(CORONARY near DISEASE*)
(CORONARY near BYPASS)
(CORONARY near THROMBO*)
(CORONARY near ANGIOPLAST)
(CORONARY near ANGIOPLAST*)
(MYOCARD* near ISCHEMI*)
(MYOCARD* near ISCHAEMI*)

(MYOCARD* near INFARCT*)
(HEART near INFARCT*)
ANGINA
((((((((((#1 or #2) or #3) or #4) or #5) or #6) or #7) or #8) or #9) or #10) or #11) or #12) or #13) or #14)
REHABILITATION*:ME
REHABILITAT*
PSYCHOTHERAPY*:ME
COUNSELING*:ME
RELAXATION-TECHNIQUES*:ME
PSYCHOTHERAP*
COUNSELING
COUNSELLING
RELAX*
(BEHAVIOR* near MODIF*)
(BEHAVIOUR* near MODIF*)
(BEHAVIOR* near THERAP*)
(BEHAVIOUR* near THERAP*)
(COGNITIVE* near THERAP*)
(STRESS near MANAGE*)
MEDITATION*:ME
MEDITAT*
ANXIETY:ME
(ANXIETY near MANAGE*)
DISTRESS*
PSYCHOPATHOLOGY*:ME
PSYCHOPATHOL*
AUTOGENIC-TRAINING*:ME
AUTOGENIC*
HEALTH-EDUCATION*:ME
(HEALTH near EDUCAT*)
(PATIENT near EDUCAT*)
(SELF near MANAGE*)
PSYCHOEDUCAT*
((((((((((((((((((((((((((((((#15 or #16) or #17) or #18) or #19) or #20) or #21) or #22) or #23) or #24) or #25) or #26) or #27) or #28) or #29) or #30) or #31) or #32) or #33) or #34) or #35) or #36) or #37) or #38) or #39) or #40) or #41) or #42) or #43) or #44)
(#45 and #46)

Appendix 2. Search Strategies 2009

Cochrane Library

#1 MeSH descriptor Myocardial Ischemia explode all trees
#2 (myocard* NEAR isch*mi*)
#3 isch*mi* NEAR heart
#4 MeSH descriptor Coronary Artery Bypass explode all trees
#5 coronary
#6 MeSH descriptor Coronary Disease explode all trees
#7 MeSH descriptor Myocardial Revascularization explode all trees
#8 MeSH descriptor Myocardial Infarction explode all trees
#9 myocard* NEAR infarct*
#10 heart NEAR infarct*

#11 MeSH descriptor Angina Pectoris explode all trees
#12 angina
#13 MeSH descriptor Heart Failure, Congestive explode all trees
#14 heart and (failure or attack)
#15 MeSH descriptor Heart Diseases explode all trees
#16 heart and disease*
#17 myocard*
#18 cardiac*
#19 CABG
#20 PTCA
#21 stent* AND (heart or cardiac*)
#22 MeSH descriptor Heart Bypass, Left explode all trees
#23 MeSH descriptor Heart Bypass, Right explode all trees
#24 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23)
#25 MeSH descriptor Psychotherapy explode all trees
#26 psychotherap*
#27 psycholog* NEAR intervent*
#28 relax*
#29 MeSH descriptor Mind-Body and Relaxation Techniques explode all trees
#30 MeSH descriptor Counseling explode all trees
#31 counsel*ing
#32 MeSH descriptor Cognitive Therapy explode all trees
#33 MeSH descriptor Behavior Therapy explode all trees
#34 (behavio*r*) NEAR/4 (modif* or therap* or rehab* or change)
#35 MeSH descriptor Stress, Psychological explode all trees
#36 stress NEAR manage*
#37 cognitive* NEAR therap*
#38 MeSH descriptor Meditation explode all trees
#39 meditat*
#40 MeSH descriptor Anxiety, this term only
#41 (manage*) NEAR (anxiety or depres*)
#42 CBT
#43 hypnotherap*
#44 goal NEAR/3 setting
#45 (psycho-educat*) or (psychoeducat*)
#46 motivat* NEAR interv*
#47 MeSH descriptor Psychopathology explode all trees
#48 psychopathol*
#49 MeSH descriptor Autogenic Training explode all trees
#50 autogenic*
#51 self near (manage* or care or motivat*)
#52 distress*
#53 psychosocial* or psycho-social
#54 #24 and #53

MEDLINE (on Ovid) Search Date: 06012009

1 exp Myocardial Ischemia/
2 (MYOCARD$4 adj4 (ISCHAEMI$2 or ISCHEMI$2)).tw.
3 exp Coronary Artery Bypass/
4 ((ISCHAEMI$2 or ISCHEMI$2) adj4 HEART).tw.
5 CORONARY.ti,ab.

6 exp Coronary Disease/
7 exp Myocardial Revascularization/
8 exp Myocardial Infarction/
9 (MYOCARD$5 adj4 INFARCT$5).tw.
10 (HEART adj4 INFARCT$5).tw.
11 exp Angina Pectoris/
12 ANGINA.tw.
13 exp Heart Failure/
14 (HEART adj6 Failure).tw.
15 or/1-14507141
16 exp Heart Diseases/
17 (Heart adj4 disease$2).tw.
18 MYOCARD$5.tw.
19 CARDIAC$2.tw.
20 CABG.tw.
21 PTCA.tw.
22 (STENT$4 and HEART).tw.
23 Heart Bypass, Left/ or Heart Bypass, Right/
24 or/16-23
25 exp Psychotherapy/
26 PSYCHOTHERAP$2.tw.
27 (PSYCHOLOG$5 adj INTERVENT$5).tw.
28 RELAX$6.tw.
29 exp Relaxation Techniques/ or exp "Mind-Body and Relaxation Techniques"/
30 exp Counseling/
31 (COUNSELLING or COUNSELING).tw.
32 ((BEHAVIOR$4 or BEHAVIOUR$4) adj4 (MODIFY or MODIFICAT$4 or THERAP$2 or CHANGE)).tw.
33 Stress, Psychological/
34 (STRESS adj4 MANAGEMENT).tw.
35 (COGNITIVE adj4 THERAP$2).tw.
36 MEDITAT$4.tw.
37 ANXIETY.tw.
38 (MANAGE$5 adj2 (ANXIETY or DEPRES$5)).tw.
39 CBT.tw.
40 HYPNOTHERAP$5.tw.
41 (GOAL$2 adj3 SETTING).tw.
42 (PSYCHO-EDUCAT$5 or PSYCHOEDUCAT$5).tw.
43 (MOTIVAT$5 adj3 (INTERVENTION or INTERV$3)).tw.
44 Psychopathology/
45 PSYCHOPATHOL$4.tw.
46 PSYCHOSOCIAL$4.tw.
47 DISTRESS$4.tw.
48 Health Education/
49 (HEALTH adj2 EDUCATION).tw.
50 (HEART adj MANUAL).tw.
51 Autogenic Training/
52 AUTOGENIC$5.tw.
53 or/25-52
54 24 or 15
55 53 and 54
56 Randomized controlled trial.pt.
57 randomized controlled trial/
58 (random$ or placebo$).ti,ab,sh.

59 ((singl$ or double$ or triple$ or treble$) and (blind$ or mask$)).tw,sh.
60 or/56-59
61 "controlled clinical trial".pt.
62 (retraction of publication or retracted publication).pt.
63 61 or 62 or 60
64 63 and 55
65 (ANIMALS not HUMANS).sh.
66 64 not 65

EMBASE 1996 to 2008 Week 52

1 Heart Disease/
2 (MYOCARD$4 adj2 (ISCHAEMI$2 or ISCHEMI$2)).tw.
3 ((ISCHAEMI$2 or ISCHEMI$2) adj4 HEART).tw.
4 Coronary Artery Disease/
5 Transluminal Coronary Angioplasty/
6 (CORONARY adj4 (DISEASE$2 or BYPASS$2 or THROMBO$5 or ANGIOPLAST$2)).tw.
7 Heart Infarction/
8 (MYOCARD$4 adj2 INFARCT$5).tw.
9 (HEART adj2 INFARC$5).tw.
10 Heart Muscle Revascularization/
11 Angina Pectoris/
12 ANGINA.tw.
13 (HEART adj2 FAILURE).tw.
14 (HEART adj2 DISEASE$2).tw.
15 CARDIAC$2.tw.
16 CABG.tw.
17 PTCA.tw.
18 (STENT$4 and HEART).ti,ab.
19 Extracorporeal Circulation/
20 or/1-19
21 Psychotherapy/
22 PSYCHOTHERAP$2.tw.
23 RELAX$6.tw.
24 (PSYCHOLOG$5 adj4 INTERVENT$5).tw.
25 Relaxation Training/
26 exp Counseling/
27 (COUNSELLING or COUNSELING).tw.
28 ((BEHAVIOR$4 or BEHAVIOUR$4) adj4 (MODIFY or MODIFICAT$4 or THERAPY$2 or CHANGE)).mp.
29 Stress Management/
30 ((BEHAVIOR$4 or BEHAVIOUR$4) adj4 (MODIFY or MODIFICAT$4 or THERAPY$2 or CHANGE)).tw.
31 (STRESS adj3 MANAGEMENT).tw.
32 exp Meditation/
33 MEDITAT$5.tw.
34 (MANAGE$5 adj2 (ANXIETY or DEPRES$5)).tw.
35 CBT.tw.
36 HYPNOTHERAP$2.tw.
37 (GOAL$2 adj3 SETTING).tw.
38 (MOTIVAT$5 adj4 INTERVENT$6).tw.
39 Psychosocial Care/
40 Psychosocial Rehabilitation/
41 PSYCHOSOCIAL.tw.
42 Autogenic Training/

43 AUTOGENIC.tw.
44 or/21-43
45 44 and 20
46 Randomized Controlled Trial/
47 Single Blind Procedure/
48 Double Blind Procedure/
49 Crossover Procedure/
50 46 or 47 or 48 or 49
51 (random$ or factorial$ or crossover$ or placebo$ or (cross adj over) or assign$).ti,ab.
52 ((singl$ or double$ or triple$ or treble$) and (blind$ or mask$)).ti,ab.
53 controlled clinical trial*.ti,ab.
54 53 or 51 or 52 or 50
55 45 and 54
56 (animal$ not human$).sh,hw.
57 55 not 56

PsycINFO 1806 to December Week 4 2008

1 (RANDOM$5 or PLACEBO$5).tw.
2 ((DOUBLE$4 or SINGLE$4 or TRIPLE$4) and (BLIND$4 or MASK or SHAM$4 or DUMMY)).tw.
3 RCT.tw.
4 "2000".md.
5 ((retract$4 or withdraw$4) adj (public$4 or article$2)).tw.
6 erratum correction.dt.
7 or/1-6
8 heart disorders/
9 myocardial infarctions/
10 exp Ischemia/
11 heart surgery/
12 ANGIOPLASTY.tw.
13 (HEART adj BYPASS).mp. [mp=title, abstract, heading word, table of contents, key concepts]
14 CORONARY.tw.
15 (ISCHEMI$3 or ISCHAEMI$3).tw.
16 (MYOCARD$5 adj2 INFARCT$5).ti,ab.
17 (HEART adj2 (INFARC$5 or FAILURE or ATTACK)).tw.
18 ANGINA.tw.
19 (HEART adj6 DISEASE$2).tw.
20 MYOCARD$5.tw.
21 CARDIAC$4.tw.
22 CABG.tw.
23 PTCA.tw.
24 or/8-23
25 exp Psychotherapy/
26 PSYCHOTHERAP$2.tw.
27 treatment/
28 (PSYCHOLOG$4 adj2 INTERVENT$5).tw.
29 exp Counseling/
30 Coping Behavior/
31 exp Meditation/
32 Autogenic Training/
33 RELAX$6.tw.
34 (COUNSELLING or COUNSELING).tw.
35 ((BEHAVIOUR or BEHAVIOR) adj3 (MODIF$5 or THERAP$5 or REHABILIT$5 or CHANGE)).tw.

36 (STRESS adj2 MANAGE$5).tw.
37 MEDITAT$5.tw.
38 (MANAGE$5 adj2 (ANXIETY or DEPRES$5)).tw.
39 (CBT or (COGNITIV$2 adj2 THERAP$3)).tw.
40 HYPNOTHERAP$3.tw.
41 (PSYCHO-EDUCAT$6 or PSYCHOEDUCAT$6).tw.
42 (MOTIVAT$5 adj2 INTERVENT$5).tw.
43 (SELF adj2 MANAG$6).tw.
44 AUTOGENIC$3.tw.
45 (GOAL adj2 SETTING).tw.
46 or/25-45
47 46 and 24
48 7 and 47

CINAHL (OVID database with NLH interface)

Search Date: 07012009
1 (((MYOCARD* OR HEART) AND (ISCHAEMI* OR ISCHEMI*))).ti,ab
2 CORONARY.ti,ab
3 (((MYOCARD* OR HEART) AND INFARC*)).ti,ab
4 ANGINA.ti,ab
5 ((HEART AND FAILURE)).ti,ab
6 (HEART AND DISEAS*).ti,ab
7 CARDIAC*.ti,ab
8 CABG.ti,ab
9 PTCA.ti,ab
10 (STENT* AND (HEART OR CARDIAC$4)).ti,ab
11 MYOCARDIAL ISCHEMIA/
12 MYOCARDIAL INFARCTION/
13 CORONARY ARTERY BYPASS/
14 CORONARY DISEASE/
15 CARDIAC PATIENTS/
16 MYOCARDIAL DISEASES/
17 MYOCARDIAL REVASCULARIZATION/
18 HEART DISEASES/
19 CARDIOVASCULAR DISEASES/
20 HEART FAILURE, CONGESTIVE/
21 ANGINA PECTORIS/
22 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR 20 OR 21
23 exp PSYCHOTHERAPY/
24 PSYCHOTHERAP*.ti,ab
25 (PSYCHOLOG* AND INTERVENT*).ti,ab
26 RELAX*.ti,ab
27 RELAXATION TECHNIQUES/
28 ((COUNSELLING OR COUNSELING)).ti,ab
29 exp COUNSELING/
30 (((BEHAVIOR* OR BEHAVIOUR*) AND (MODIFY OR MODIFICAT* OR THERAP* OR CHANGE))).ti,ab
31 STRESS MANAGEMENT/
32 (STRESS AND MANAG*).ti,ab
33 (COGNITIVE AND THERAP*).ti,ab
34 exp MEDITATION/
35 MEDITAT*.ti,ab

36 exp ANXIETY/
37 (MANAGE* AND (ANXIETY OR DEPRESS*)).ti,ab
38 CBT.ti,ab
39 HYPNOTHERAP*.ti,ab
40 ((GOAL* AND SETTING)).ti,ab
41 (PSYCHO-EDUCAT* OR PSYCHOEDUCAT*).ti,ab
43 ((MOTIVAT* NEAR (INTERV* OR INTERVENT*))).ti,ab
44 ((MOTIVAT* AND (INTERV* OR INTERVENT*))).ti,ab
45 PSYCHOSOCIAL*.ti,ab
46 AUTOGENIC*.ti,ab
47 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40 OR 41 OR 43 OR 44 OR 45 OR 46
48 22 AND 47
49 ((SINGL* OR DOUBLE* OR TRIPLE* OR TREBLE*) AND (BLIND* OR MASK*)).ti,ab
50 (RANDOM* OR PLACEBO*).ti,ab
51 CLINICAL TRIALS/
52 (CONTROLLED ADJ CLINICAL ADJ TRIALS).ti,ab
53 49 OR 50 OR 51 OR 52
54 48 AND 53
55 48 [Limit to: (Publication Type Clinical Trial)]
Line 54 was downloaded separately to line 55 to incorporate both the text/thesaurus term filter and the interface filter and then de-duplicated in RefMan

WHAT'S NEW

Last assessed as up-to-date: 30 July 2009.

Date	Event	Description
7 June 2011	New search has been performed	In addition to updating the original Cochrane review, this update review has: restricted inclusion to studies in which (1) it was stated that staff delivering the psychological intervention had received training in psychological intervention, and (2) that compared the effect of psychological therapy separately from the effects of other non-psychological interventions, particularly exercise training. It has also: (3) introduced a system of classification for psychological interventions based on the aims and components of each treatment; and (4) formally explored the heterogeneity and variation in psychological intervention effects using meta-regression. Finally, (5) the updated review did not consider modifiable cardiac risk outcomes (e.g. serum lipids, blood pressure, or smoking prevalence)
7 June 2011	New citation required but conclusions have not changed	The conclusion of this review remain essentially the same as the previous version of the review i.e. whilst psychological treatments (compared to usual care) appear effective in treating psychological symptoms of CHD patients there no strong evidence of reducing total deaths or risk of

(*Continued*)

		revascularisation or non-fatal infarction in patients with CHD

HISTORY

Protocol first published: Issue 1, 2001

Review first published: Issue 2, 2004

Date	Event	Description
21 August 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

All co-reviewers were involved in the design of the review and in providing critical comments about the manuscript. Ben Whalley, Philippa Davies and Rod Taylor selected studies for inclusion and Ben Whalley, Philippa Davies and Zulian Liu abstracted data from the source papers. Tiffany Moxham was responsible for adaptation of original search strategies and implementaion of current searches. Analyses were performed by Ben Whalley. Ben Whalley and Rod Taylor wrote the first draft of the updated review. Robert West and Shah Ebrahim were the principal advisors.

DECLARATIONS OF INTEREST

None

SOURCES OF SUPPORT

Internal sources

- Department of Social Medicine, University of Bristol, UK.
- Health Services Research Focus, University of Wales College of Medicine, UK.

External sources

- British Heart Foundation, UK.
- ESRC, UK.

Postdoctoral Fellowship for Ben Whalley (PTA-026-27-2113)

- NIHR, UK.

Cochrane Heart Programme Grant

INDEX TERMS

Medical Subject Headings (MeSH)

*Psychotherapy; Anxiety [*therapy]; Coronary Disease [mortality; *psychology]; Depression [*therapy]; Myocardial Infarction [prevention & control; *psychology]; Myocardial Revascularization [*psychology]; Reoperation

MeSH check words

Aged; Female; Humans; Male