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Exercise-based cardiac rehabilitation for coronary heart disease (Review)

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[Intervention Review]

Exercise-based cardiac rehabilitation for coronary heart disease

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ABSTRACT

Background

Coronary heart disease (CHD) is the most common cause of death globally. However, with falling CHD mortality rates, an increasing number of people living with CHD may need support to manage their symptoms and prognosis. Exercise-based cardiac rehabilitation (CR) aims to improve the health and outcomes of people with CHD. This is an update of a Cochrane Review previously published in 2016.

Objectives

To assess the clinical effectiveness and cost-effectiveness of exercise-based CR (exercise training alone or in combination with psychosocial or educational interventions) compared with 'no exercise' control, on mortality, morbidity and health-related quality of life (HRQoL) in people with CHD.

Search methods

We updated searches from the previous Cochrane Review, by searching CENTRAL, MEDLINE, Embase, and two other databases in September 2020. We also searched two clinical trials registers in June 2021.

Selection criteria

We included randomised controlled trials (RCTs) of exercise-based interventions with at least six months' follow-up, compared with 'no exercise' control. The study population comprised adult men and women who have had a myocardial infarction (MI), coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI), or have angina pectoris, or coronary artery disease.

Data collection and analysis

We screened all identified references, extracted data and assessed risk of bias according to Cochrane methods. We stratified meta-analysis by duration of follow-up: short-term (6 to 12 months); medium-term (> 12 to 36 months); and long-term (> 3 years), and used meta-regression to explore potential treatment effect modifiers. We used GRADE for primary outcomes at 6 to 12 months (the most common follow-up time point).

Main results

This review included 85 trials which randomised 23,430 people with CHD. This latest update identified 22 new trials (7795 participants). The population included predominantly post-MI and post-revascularisation patients, with a mean age ranging from 47 to 77 years.

In the last decade, the median percentage of women with CHD has increased from 11% to 17%, but females still account for a similarly small percentage of participants recruited overall (< 15%). Twenty-one of the included trials were performed in low- and middle-income countries (LMICs). Overall trial reporting was poor, although there was evidence of an improvement in quality over the last decade. The median longest follow-up time was 12 months (range 6 months to 19 years).

At short-term follow-up (6 to 12 months), exercise-based CR likely results in a slight reduction in all-cause mortality (risk ratio (RR) 0.87, 95% confidence interval (CI) 0.73 to 1.04; 25 trials; moderate certainty evidence), a large reduction in MI (RR 0.72, 95% CI 0.55 to 0.93; 22 trials; number needed to treat for an additional beneficial outcome (NNTB) 75, 95% CI 47 to 298; high certainty evidence), and a large reduction in all-cause hospitalisation (RR 0.58, 95% CI 0.43 to 0.77; 14 trials; NNTB 12, 95% CI 9 to 21; moderate certainty evidence). Exercise-based CR likely results in little to no difference in risk of cardiovascular mortality (RR 0.88, 95% CI 0.68 to 1.14; 15 trials; moderate certainty evidence), CABG (RR 0.99, 95% CI 0.78 to 1.27; 20 trials; high certainty evidence), and PCI (RR 0.86, 95% CI 0.63 to 1.19; 13 trials; moderate certainty evidence) up to 12 months' follow-up. We are uncertain about the effects of exercise-based CR on cardiovascular hospitalisation, with a wide confidence interval including considerable benefit as well as harm (RR 0.80, 95% CI 0.41 to 1.59; low certainty evidence). There was evidence of substantial heterogeneity across trials for cardiovascular hospitalisations (I^2 = 53%), and of small study bias for all-cause hospitalisation, but not for all other outcomes.

At medium-term follow-up, although there may be little to no difference in all-cause mortality (RR 0.90, 95% CI 0.80 to 1.02; 15 trials), MI (RR 1.07, 95% CI 0.91 to 1.27; 12 trials), PCI (RR 0.96, 95% CI 0.69 to 1.35; 6 trials), CABG (RR 0.97, 95% CI 0.77 to 1.23; 9 trials), and all-cause hospitalisation (RR 0.92, 95% CI 0.82 to 1.03; 9 trials), a large reduction in cardiovascular mortality was found (RR 0.77, 95% CI 0.63 to 0.93; 5 trials). Evidence is uncertain for difference in risk of cardiovascular hospitalisation (RR 0.92, 95% CI 0.76 to 1.12; 3 trials).

At long-term follow-up, although there may be little to no difference in all-cause mortality (RR 0.91, 95% CI 0.75 to 1.10), exercise-based CR may result in a large reduction in cardiovascular mortality (RR 0.58, 95% CI 0.43 to 0.78; 8 trials) and MI (RR 0.67, 95% CI 0.50 to 0.90; 10 trials). Evidence is uncertain for CABG (RR 0.66, 95% CI 0.34 to 1.27; 4 trials), and PCI (RR 0.76, 95% CI 0.48 to 1.20; 3 trials).

Meta-regression showed benefits in outcomes were independent of CHD case mix, type of CR, exercise dose, follow-up length, publication year, CR setting, study location, sample size or risk of bias.

There was evidence that exercise-based CR may slightly increase HRQoL across several subscales (SF-36 mental component, physical functioning, physical performance, general health, vitality, social functioning and mental health scores) up to 12 months' follow-up; however, these may not be clinically important differences. The eight trial-based economic evaluation studies showed exercise-based CR to be a potentially cost-effective use of resources in terms of gain in quality-adjusted life years (QALYs).

Authors' conclusions

This updated Cochrane Review supports the conclusions of the previous version, that exercise-based CR provides important benefits to people with CHD, including reduced risk of MI, a likely small reduction in all-cause mortality, and a large reduction in all-cause hospitalisation, along with associated healthcare costs, and improved HRQoL up to 12 months' follow-up. Over longer-term follow-up, benefits may include reductions in cardiovascular mortality and MI. In the last decade, trials were more likely to include females, and be undertaken in LMICs, increasing the generalisability of findings. Well-designed, adequately-reported RCTs of CR in people with CHD more representative of usual clinical practice are still needed. Trials should explicitly report clinical outcomes, including mortality and hospital admissions, and include validated HRQoL outcome measures, especially over longer-term follow-up, and assess costs and cost-effectiveness.

PLAIN LANGUAGE SUMMARY

Exercise-based rehabilitation for coronary heart disease

Background

Coronary heart disease (CHD) is the single most common cause of death globally. However, with falling CHD mortality rates, an increasing number of people live with CHD and may need support to manage their symptoms (such as angina, shortness of breath with physical activity, and fatigue) and reduce the chances of future problems, such as heart attacks. Exercise-based cardiac rehabilitation (exercise training alone or in combination with psychological or educational interventions) aims to improve the health and outcomes of people with CHD.

Study characteristics

We searched the scientific literature for randomised controlled trials (experiments that randomly allocate participants to one of two or more treatment groups) looking at the effectiveness of exercise-based treatments compared with no exercise in people of all ages with CHD. The evidence is current to September 2020.

Key results

This latest update identified an additional 22 trials (7795 participants). We included a total of 85 trials that studied 23,430 people with CHD, predominantly heart attack survivors and those who had undergone heart bypass surgery or angioplasty (a procedure which widens narrowed or obstructed arteries or veins). Thirty-eight (45%) of the trials involved exercise-only interventions and 47 (55%) involved interventions with exercise plus other components. The type of exercise most often included was stationary cycling, walking or circuit training. Twenty-one (25%) of the interventions were delivered in the participants' homes.

The findings of this update are consistent with the previous (2016) version of this Cochrane Review, and show important benefits of exercise-based cardiac rehabilitation that include a reduction in the risk of death due to any cause, heart attack, and hospital admission, and improvements in health-related quality of life, compared with not undertaking exercise. A small body of economic evidence was identified, indicating exercise-based cardiac rehabilitation to be cost-effective. Many of the studies identified in this current update were undertaken in low- and middle-income countries, which increases the generalisability of our results to these settings where levels of CHD are high and continue to increase.

Quality of evidence

Although the reporting of methods has improved in recent trials, lack of reporting key methodological aspects made it difficult to assess the overall methodological quality and risk of possible bias of the evidence.

Summary of findings 1. Exercise-based cardiac rehabilitation compared to 'no exercise' control for coronary heart disease

Exercise-based cardiac rehabilitation compared to 'no exercise' control for coronary heart disease

Patient or population: people with coronary heart disease
Setting: hospital-based, community-based and home-based settings
Intervention: exercise-based cardiac rehabilitation
Comparison: 'no exercise' control

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	№ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with 'no exercise' control	Risk with exercise-based cardiac rehabilitation				
All-cause mortality Follow-up: range 6 months to 12 months	Study population 57 per 1000	50 per 1000 (42 to 59)	RR 0.87 (0.73 to 1.04)	8823 (25 RCTs)	⊕⊕⊕⊖ Moderate[a]	Exercise-based cardiac rehabilitation likely results in a slight reduction in all-cause mortality up to 12 months' follow-up. 25 RCTs with 26 comparisons. 14 RCTs reported 0 events in both the intervention and control groups.
Cardiovascular mortality Follow-up: range 6 months to 12 months	Study population 45 per 1000	39 per 1000 (30 to 51)	RR 0.88 (0.68 to 1.14)	5360 (15 RCTs)	⊕⊕⊕⊖ Moderate[a]	Exercise-based cardiac rehabilitation likely results in little to no difference in cardiovascular mortality up to 12 months' follow-up. 5 RCTs reported 0 events in both the intervention and control groups.
Fatal and/or non-fatal MI Follow-up: range 6 months to 12 months	Study population 48 per 1000	35 per 1000 (27 to 45)	RR 0.72 (0.55 to 0.93)	7423 (22 RCTs)	⊕⊕⊕⊕ High	Exercise-based cardiac rehabilitation results in a large reduction in fatal and/or non-fatal MI up to 12 months' follow-up. 24 RCTs with 24 comparisons. 3 RCTs reported 0 events in both the intervention and control groups. NNTB 75 (95% CI 47 to 298)
Revascularisation - CABG Follow-up: range 6 months to 12 months	Study population 56 per 1000	56 per 1000 (44 to 72)	RR 0.99 (0.78 to 1.27)	4473 (20 RCTs)	⊕⊕⊕⊕ High	Exercise-based CR results in little to no difference in CABG revascularisation up to 12 months' follow-up. 20 RCTs with 22 comparisons. 2 RCTs reported 0 events in both the intervention and control groups.

Revascularisation - PCI Follow-up: range 6 months to 12 months	Study population		RR 0.86 (0.63 to 1.19)	3465 (13 RCTs)	⊕⊕⊕⊖ Moderate[a]	Exercise-based CR likely results in little to no difference in risk of PCI revascularisation up to 12 months' follow-up. 13 RCTs with 14 comparisons. 3 RCTs reported 0 events in both the intervention and control groups.
	60 per 1000	52 per 1000 (38 to 72)				
All-cause hospital admissions Follow-up: range 6 months to 12 months	Study population		RR 0.58 (0.43 to 0.77)	2030 (14 RCTs)	⊕⊕⊕⊖ Moderate[b]	Exercise-based cardiac rehabilitation likely results in a large reduction in all-cause hospital admissions up to 12 months' follow-up. 14 RCTs with 16 comparisons. One RCT reported 0 events in both the intervention and control group. NNTB 12 (95% CI 9 to 21)
	214 per 1000	124 per 1000 (92 to 165)				
Cardiovascular hospital admissions Follow-up: range 6 months to 12 months	Study population		RR 0.80 (0.41 to 1.59)	1087 (6 RCTs)	⊕⊕⊖⊖ Low[a,c]	We are uncertain about the effects of exercise-based CR on cardiovascular hospitalisation, with a wide confidence interval including considerable benefit as well as harm.
	78 per 1000	62 per 1000 (32 to 123)				

*__The risk in the intervention group__ (and its 95% confidence interval) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: confidence interval; **RR:** risk ratio; **OR:** odds ratio; **NNTB/H:** number needed to treat for an additional beneficial/harmful outcome

GRADE Working Group grades of evidence
High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

[a]95% CI is wide and overlaps no effect; therefore, downgraded by one level for imprecision.
[b]P < 0.05 in the Egger test, and funnel plot asymmetry; therefore, downgraded by one level for suspected publication bias.
[c]Evidence of heterogeneity in the I^2 test; therefore, downgraded by one level for substantial heterogeneity.

BACKGROUND

Description of the condition

Coronary heart disease (CHD, see Glossary in Appendix 1) is the single most common cause of death globally, with 7.46 million deaths in 2016, accounting for one-third of all deaths (WHO 2018). In the United Kingdom (UK), an estimated 2.3 million people live with CHD – around 1.5 million men and 830,000 women, and the condition accounts for one in seven deaths in men and one in twelve deaths in women (BHF 2020). Although remaining stubbornly constant in low- and middle-income countries, the mortality rate from CHD has been falling in the UK and other high-income settings. This is due to factors such as declines in cigarette smoking, improvements in hypertension treatment and control, widespread use of statins to lower circulating cholesterol levels, and the development and timely use of thrombolysis and stents in acute coronary syndromes (Mensah 2017). Accordingly, an increasingly large number of people live with CHD and may need support to manage their symptoms and prognosis.

Description of the intervention

Many definitions of cardiac rehabilitation (CR) have been proposed. The following definition encompasses the key concepts of CR: "The coordinated sum of activities required to influence favourably the underlying cause of cardiovascular disease, as well as to provide the best possible physical, mental and social conditions, so that the patients may, by their own efforts, preserve or resume optimal functioning in their community and through improved health behaviour, slow or reverse progression of disease" (BACPR 2017). CR is a complex intervention that may involve a variety of therapies, including exercise, risk factor education, behaviour change, psychological support, and strategies that are aimed at targeting traditional risk factors for cardiovascular disease. CR is an essential part of contemporary CHD care and is considered a priority in countries with a high prevalence of CHD. Based on evidence - including from the previous version of this Cochrane Review (Anderson 2016) - CR following a cardiac event is a Class I recommendation from the European Society of Cardiology, and the American Heart Association and American College of Cardiology, with exercise therapy consistently identified as a central element (Knuuti 2020; Smith 2011). However, despite these positive recommendations for exercise-based CR, it continues to be widely underused with overall participation rates in recent decades of about 40% (Kotseva 2018). Service provision, though predominantly hospital-based, varies markedly, and referral, enrolment and completion are sub-optimal, especially amongst women and older people (Peters 2017; Ruano-Ravina 2016). Home- and technology-based CR programmes have been advocated to widen access and participation (Dalal 2015), and interventions aimed at improving people's uptake and adherence to CR programmes have been identified (Santiago de Araújo Pio 2019).

Exercise-based CR appears to be a safe intervention. An observational study of more than 25,000 people undergoing CR reported one cardiac event for 50,000 hours of exercise training, equivalent to 1.3 cardiac arrests per million patient-hours (Pavy 2006). An earlier study reported one case of ventricular fibrillation per 111,996 patient-hours of exercise, and one myocardial infarction (MI) per 294,118 patient-hours (Van Camp 1986). In the context of CR, higher risk CHD populations have been defined as those with severe in-hospital complications after acute coronary syndrome (ACS), cardiac surgery, or percutaneous coronary intervention (PCI) (Pelliccia 2020; Piepoli 2010).

How the intervention might work

Exercise training has been shown to have direct benefits on the heart and coronary vasculature, including myocardial oxygen demand, endothelial function, autonomic tone, coagulation and clotting factors, inflammatory markers, and the development of coronary collateral vessels (Clausen 1976; Hambrecht 2000). However, findings of the original Cochrane Review of exercise-based CR for CHD (Jolliffe 2001), supported the hypothesis that reductions in mortality may also be mediated via the indirect effects of exercise through improvements in atherosclerotic risk factors (i.e. lipids, smoking and blood pressure) (Taylor 2006).

Why it is important to do this review

People who have had acute MI and coronary revascularisation (along with heart failure) remain those most frequently recommended for CR referral by healthcare systems across the world (Piepoli 2010; Pelliccia 2020). Regular updates to this systematic review of randomised controlled trials (RCTs) of CR for CHD is therefore key to ensuring the contemporary nature of the evidence base in order to continue to inform healthcare policy makers and guideline producers.

The 2016 Cochrane review made the following two key recommendations for future evidence collection and clinical trials (Anderson 2016).

- The need for further evidence from 'hard to reach' groups, including women, elderly people, and ethnic minorities.
- The need for more consistent collection and reporting of validated health-related quality of life (HRQoL) outcomes, costs and cost-effectiveness.

In addition, the majority of evidence (58/63, 92%) in Anderson 2016 was collected in high-income countries (HICs), with a need to consider trials from low- and middle-income countries (LMICs) when they become available.

OBJECTIVES

To assess the clinical effectiveness and cost-effectiveness of exercise-based CR (exercise training alone or in combination with psychosocial or educational interventions) compared with 'no exercise' control, on mortality, morbidity and health-related quality of life (HRQoL) in people with CHD.

METHODS

Criteria for considering studies for this review

Types of studies

We included RCTs (with individual participant or cluster allocation, or cross-over design) and quasi-RCTs (RCTs in which treatment allocation was obtained by alternation or other predictable methods) of exercise-based CR versus 'no exercise' control. In order to present outcome data that are meaningful and relevant for clinical and policy decision-making, we limited our search to studies with a follow-up period of at least six months in our 2011 update of this Cochrane Review and subsequent updates.

Where a full text was not available, we contacted the study authors and attempted to collect further information. If we received no response, we placed the study into the 'awaiting classification' category.

Types of participants

We included adult (≥ 18 years) men and women, in either hospital-based and community-based settings, who have had a myocardial infarction (MI), or who have undergone revascularisation (CABG, PCI) or who have angina pectoris or coronary artery disease defined by angiography. We included trials with mixed indication population as long as more than 50% of the trial participants had a CHD diagnosis. Please note that the terms CHD and coronary artery disease (CAD) are (or can be) sometimes used interchangeably and terms are presented as described by trialists in the Characteristics of included studies.

We excluded studies which only included participants following heart valve surgery, with heart failure, atrial fibrillation or heart transplants, or implanted with either cardiac-resynchronisation therapy or implantable cardiovertor defibrillators. These indications are the subject of other Cochrane reviews (Anderson 2017; Nielsen 2019; Risom 2017; Sibilitz 2016; Long 2019). We also excluded studies of participants who had completed a CR programme prior to randomisation.

Types of interventions

Exercise-based CR is defined as a supervised or unsupervised inpatient, outpatient, community- or home-based intervention which includes some form of exercise training that is applied to a cardiac patient population. The intervention could be exercise training alone or exercise training in addition to psychosocial or educational interventions, or both (i.e. "comprehensive CR").

All CR interventions were compared to a 'no exercise' control, and both the intervention and control group received usual medical care. Usual care could include standard medical care, such as drug therapy, but without any form of structured exercise training or advice.

Types of outcome measures

Studies should have intended to assess any of the following outcomes in both the CR and the control groups, but these outcomes did not form the basis of our inclusion/exclusion criteria. We collected outcome data at three follow-up periods: short-term (6 to 12 months), medium-term (> 12 to 36 months), and long-term (> than 36 months).

Primary outcomes

- All-cause mortality
- Cardiovascular mortality
- Fatal MI and/or non-fatal MI
- Revascularisation with CABG
- Revascularisation with PCI
- All-cause hospitalisation
- Cardiovascular hospitalisation

We sought data on the number of trial participants who experienced the above events.

Secondary outcomes

- HRQoL assessed using validated instruments (e.g. SF-36 (a 36-item Short Form Health Survey); or EQ-5D (a standardised measure developed by the EuroQol Group))
- Costs and cost-effectiveness - we sought reports of total healthcare or societal costs, or both. Cost-effectiveness analyses should have reported incremental difference in cost and outcome between CR and control (e.g. cost per quality-adjusted life year (QALY) or cost per life year gained (LYG) analysis).

Search methods for identification of studies

Electronic searches

We updated the search from the previously published Cochrane Review (Anderson 2016), by searching the following databases on 1 September 2020.

- Cochrane Central Register of Controlled Trials (CENTRAL) in the Cochrane Library (Issue 9, 2020).
- Epub Ahead of Print, In-Process & Other Non-Indexed Citations, MEDLINE Daily and MEDLINE (Ovid; 1946 to 1 September 2020).
- Embase (Ovid; 1980 to 2020 week 36).
- Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus (EBSCOHost; 1937 to 1 September 2020).
- SCI-Expanded and CPCI-S on Web of Science (Clarivate Analytics; 1900 to 1 September 2020).

We designed search strategies with reference to those of the previous systematic review (Anderson 2016). We searched the databases using a strategy combining subject headings and free text terms relating to exercise-based rehabilitation and coronary heart disease, with filters applied to limit to RCTs. The RCT filter for MEDLINE is the Cochrane sensitivity-maximising RCT filter, and for Embase, terms as recommended in the *Cochrane Handbook for Systematic Reviews of Intervenations* have been applied (Lefebvre 2019, hereafter referred to as the *Cochrane Handbook*). For the other databases, except CENTRAL, we applied an adaptation of the Cochrane RCT filter.

We applied date limits to the previously used search terms, and we searched for the new terms without date limits. We imposed no language or other limitations. We also gave consideration 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. See Appendix 2 for details of the search strategies used.

Searching other resources

We searched the following clinical trial registers on 21 June 2021, for ongoing clinical trials.

- World Health Organization (WHO) International Clinical Trials Registry platform (ICTRP) (apps.who.int/trialsearch/).
- ClinicalTrials.gov (www.clinicaltrials.gov).

We also handsearched reference lists of retrieved articles and systematic reviews published since the last update, for any studies not identified by the electronic searches, and we sought expert advice.

Data collection and analysis

Selection of studies

Two review authors (JF, RST) independently examined the titles and abstracts of citations identified by the electronic searches for possible inclusion, and coded them as 'retrieve' (eligible or potentially eligible/unclear) or 'irrelevant'. We retrieved full-text publications of potentially relevant studies (and had them translated into English where required), and two review authors (JF, GD) then independently determined study eligibility using a standardised inclusion form. We resolved any disagreements about study eligibility through discussion and, if necessary, a third review author (RST) was asked to arbitrate. We identified and excluded duplicates and collated multiple reports of the same study so that each study, rather than each report, is the unit of interest in the review. We recorded the selection process in sufficient detail to complete a PRISMA flow diagram and 'Characteristics of excluded studies' table (Liberati 2009).

We re-screened full texts excluded in previous versions of this review, where the reason for exclusion was based on reporting of outcomes. None of these studies were eligible for inclusion; we updated the reasons for exclusion.

Data extraction and management

Two review authors (GD, JF) independently extracted study characteristics of included RCTs and outcome data using a standardised data collection form which had been piloted on two RCTs included in the review. A third review author (RST) checked all extracted data for accuracy. We resolved disagreements by consensus. If data were presented numerically (in tables or text) and graphically (in figures), we used the numeric data because of possible measurement error when estimating from graphs. A third review author (RST) confirmed all numeric calculations and extractions from graphs or figures. We resolved any discrepancies by consensus. One author (GD) transferred extracted data into Review Manager 5.4.1 (Review Manager 2014), and a second author (RST) spot-checked data for accuracy against the included study.

The following categories of data were extracted.

- Methods: study design, total duration of study, length of follow-up, number of centres, setting, date of study conduct.
- Participants: number randomised, number lost to follow-up, number analysed, age, sex, ethnicity, CHD diagnosis, and inclusion and exclusion criteria.
- Intervention and control: mode of exercise, duration, frequency and intensity, any co-interventions and description of comparator.
- Outcome: primary and secondary outcomes.
- Funding and notable conflicts of interest of authors.

If there were multiple reports of the same study, we assessed the duplicate publications for additional data. We extracted outcome results at all follow-up points post-randomisation. We contacted study authors where necessary to provide additional information.

Assessment of risk of bias in included studies

Two review authors (GD, JF) assessed the risk of bias in included studies using the Cochrane Collaboration's risk of bias (RoB) tool, which is a domain-based critical evaluation of the following core risk of bias items: the quality of random sequence generation and allocation concealment, blinding of outcome assessment, incomplete outcome data, and selective reporting (Higgins 2011).

All risk of bias assessments were checked by a third review author (RST), and we resolved any discrepancies by consensus. Details of the assessments of risk of bias for each included trial are shown in the Characteristics of included studies tables.

Measures of treatment effect

We processed data in accordance with the *Cochrane Handbook* (Deeks 2011). Dichotomous outcomes for each comparison have been expressed as risk ratios (RR) with 95% confidence intervals (CI). For primary outcomes with an effect excluding no difference, we calculated the number needed to treat for an additional beneficial/harmful outcome (NNTB/NNTH), following methods detailed in the *Cochrane Handbook* (Schünemann 2021). We used the assumed risk with control from the 'Summary of findings 1' table as the 'assumed comparator risk'.

Continuous HRQoL outcome comparisons were pooled where possible; that is, when there were more than two studies using the same HRQoL measure and reporting results on the same scale using the mean difference (MD). We interpreted these data using published minimal clinically important differences (MCIDs) where available. For the SF-36 instrument, within-person MCIDs which vary according to domain, have been published for people with heart disease (Wyrwich 2004; 15 for physical functioning, general health and mental health; 16.7 for emotional performance; 18.75 for physical performance and vitality; 20 for bodily pain; and 25 for social functioning). There are none available for the SF-36 summary component scores. For the EQ-5D, an MCID of 0.05 was used for interpretation (Briggs 2017).

Unit of analysis issues

Some trials contained two arms of CR and a single control group. In these cases, we divided the number randomised to the control group in half to obtain the denominator for data analysis; the means and standard deviation for the control group remained unchanged for both comparisons. For trials with cluster randomisation, approximately correct analyses were attempted where sufficient information (the intracluster correlation coefficient (ICC)) was available.

Given the variation in trial reporting follow-up timings, we pooled outcome results separately at three time points; namely, short-term (6 to 12 months); medium-term (> 12 to 36 months); and long-term (> 36 months) follow-up.

Dealing with missing data

We contacted multiple authors to verify key study characteristics (such as randomisation), data queries and obtain missing numerical outcome data.

Assessment of heterogeneity

We explored heterogeneity amongst included studies qualitatively (through visual inspection of forest plots and by comparing the characteristics of included studies), and quantitatively (using the Chi^2 test of heterogeneity and the I^2 statistic). We considered the magnitude and direction of effects, and strength of evidence for heterogeneity (e.g. P value from Chi^2 and number of studies)

alongside a threshold of I^2 greater than 50% to represent substantial heterogeneity (Deeks 2011).

Assessment of reporting biases

When 10 or more studies were included in meta-analysis, we used the funnel plot and Egger test to examine small study bias (Egger 1997). We processed data in accordance with the *Cochrane Handbook* (Deeks 2011). We completed data synthesis and analyses using Review Manager 5.4.1 software (Review Manager 2014) and STATA version 16.1 (StataCorp 2020).

Data synthesis

We performed random-effects meta-analyses with 95% CIs where appropriate (i.e. when treatments, participants, and the underlying clinical question were similar enough for pooling to make sense). We used random-effects meta-analyses due to the qualitative clinical heterogeneity (types of interventions and CHD population characteristics). Compared with a fixed-effect model, this model provides a more conservative statistical comparison of the difference between intervention and control by typically providing a wider confidence interval around the effect estimate. If a statistically significant difference was present using the random-effects model, we also reported the fixed-effect pooled estimate and 95% CI, because of the tendency of smaller trials - which are more susceptible to publication bias - to be over-weighted with a random-effects analysis (Heran 2008a; Heran 2008b).

Subgroup analysis and investigation of heterogeneity

We undertook univariate meta-regression to explore heterogeneity and examine potential treatment effect modifiers. We tested ten hypotheses that there may be differences in the effect of exercise-based CR on total mortality, cardiovascular mortality, total MI, revascularisation (CABG and PCI) and all-cause hospitalisation across the following pre-defined subgroups.

- CHD case mix (% participants presenting with MI).
- 'Dose' of exercise intervention (dose (units) = number of weeks of exercise training x average number of sessions/week x average duration of session in minutes).
- Type of CR (exercise-only CR versus comprehensive CR).
- Length of follow-up period (where trial reported multiple follow-up times, the longest follow-up was used).
- Year of publication (pre-1995 versus post-1995, where 1995 is used as proxy time to represent implementation of what might be regarded as 'modern CHD usual care').
- Overall sample size (N ≤ 150 versus N > 150).
- Setting (home- or centre-based CR).
- Risk of bias (low risk of bias in < 3 out of 5 domains).
- Study location (continent - Europe, North America, Australia/Asia or Other)
- Studies undertaken in low-, middle- or high-income countries (according to the World Bank Group) (worldbank.org).

Given the relatively small ratio of trials to covariates, meta-regression was limited to univariate analysis (Deeks 2011). To account for multiple testing, a Bonferroni correction was used and a P value of less than 0.005 (0.05/10 covariates) was used to define statistical significance.

Sensitivity analysis

We did not undertake sensitivity analyses.

Summary of findings and assessment of the certainty of the evidence

One author (GD) used GRADEProfiler software to assess the certainty of evidence for primary outcomes reported in the review (GRADEpro GDT). We downgraded the evidence from high certainty by one level based on the following factors: indirectness of evidence, unexplained heterogeneity, publication bias, risk of bias due to study design limitations, and imprecision of results (Balshem 2011). A second author (RST) checked the assessment. We applied a GRADE assessment to the primary outcomes at 6 to 12 months (the most commonly reported follow-up timing across trials).

RESULTS

Description of studies

Details of the studies included in the review are listed in the Characteristics of included studies table. Details of excluded studies are listed in the Characteristics of excluded studies table.

Results of the search

In summary, a total of 85 trials reporting data for a total of 23,430 participants have been included in this review update. This includes 30 trials (55 publications, 9552 participants) from the original Cochrane Review (Jolliffe 2001) (Andersen 1981; Bell 1998; Bengtsson 1983; Bertie 1992; Bethell 1990; Carlsson 1998; Carson 1982; DeBusk 1994; Engblom 1996; Erdman 1986; Fletcher 1994; Fridlund 1991; Haskell 1994; Heller 1993; Holmbäck 1994; Kallio 1979; Leizorovicz 1991; Lewin 1992; Miller 1984; Oldridge 1991; Ornish 1990; Schuler 1992; Shaw 1981; Sivarajan 1982; Specchia 1996; Stern 1983; Vecchio 1981; Vermeulen 1983; WHO 1983; Wilhelmsen 1975); 17 studies (26 publications, 2211 participants) identified by the second updated search (Heran 2011) (Belardinelli 2001; Bäck 2008; Dugmore 1999; Giallauria 2008; Hofman-Bang 1999; Kovoor 2006; La Rovere 2002; Manchanda 2000; Marchionni 2003; Seki 2003; Seki 2008; Ståhle 1999; Toobert 2000; VHSG 2003; Yu 2003; Yu 2004; Zwisler 2008); an additional 16 trials (20 publications, 3872 participants) from the third updated search (Anderson 2016) (Aronov 2010; Bettencourt 2005a; Briffa 2005; Hambrecht 2004; Higgins 2001; Houle 2012; Maddison 2014; Maroto 2005; Munk 2009; Mutwalli 2012; Oerkild 2012; Reid 2012; Roman 1983; Sandström 2005; Wang 2012; West 2012), as well as one publication (Dorn 1999) which provided further follow-up data from a study included in the original review (Shaw 1981); and 22 trials (43 publications, 7795 participants) from this 2020 updated search (Aronov 2019; Bubnova 2019; Bubnova 2020; Byrkjeland 2015; Campo 2020; Chaves 2019; Dorje 2019; Hassan 2016; Hautala 2017; He 2020; Lear 2015; Ma 2020; Pal 2013; Pomeshkina 2017; Pomeshkina 2019; Prabhakaran 2020; Santaularia 2017; Snoek 2020; Sun 2016; Uddin 2020; Xu 2017; Zhang 2018). The study selection process is summarised in the PRISMA flow diagram shown in Figure 1 (Liberati 2009).

Figure 1. PRISMA flow diagram of study selection process

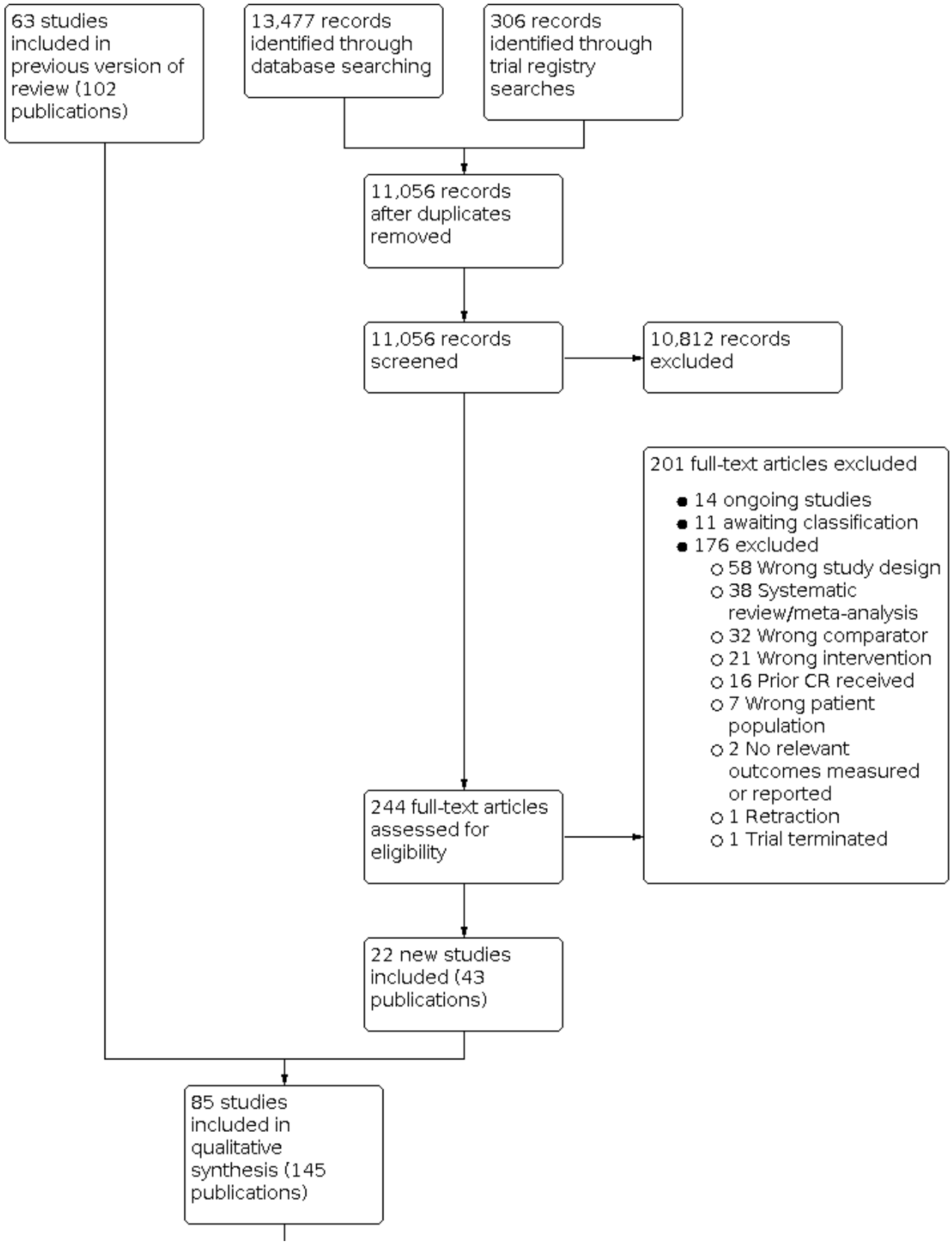
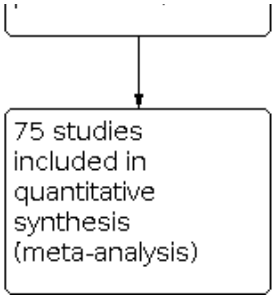


Figure 1. (Continued)



Included studies

Study design

Seventy-nine (93%) of the studies were two-arm parallel RCTs. Three studies compared more than two arms (Bubnova 2020; Pomeshkina 2017; Sivarajan 1982), and one study compared three arms with a waiting-list control design (Chaves 2019) (only outcome data at six months were used in this review as waiting-list control participants elected which arm of the study to move into after this point). One study used quasi-randomisation methods based on week of surgery (Uddin 2020). One study was a cluster-randomised trial (Heller 1993), with clustered data reported at the individual level, and no report of the ICC; therefore, we were unable to attempt to approximately correct the analyses. Given that the study sample size and number of events were small, the implications are expected to be minimal.

Setting

The majority of studies (48/85, 56%) were undertaken in Europe as single centre (61/85, 72%) studies. Most trials were relatively small in sample size (median 137, range: 25 to 3959). Three large trials contributed approximately 40% (8956 participants) of all included participants (Prabhakaran 2020; WHO 1983; West 2012). The median duration of trial intervention was 6 months (range 3 weeks to 42 months) with median overall trial follow-up of 12 months (range 6 to 228 months). Sixteen trials identified in this most recent update were undertaken in low- and middle-income countries (LMICs) (Aronov 2019; Bubnova 2019; Bubnova 2020; Chaves 2019; Dorje 2019; Hassan 2016; He 2020; Ma 2020; Pal 2013; Pomeshkina 2017; Pomeshkina 2019; Prabhakaran 2020; Sun 2016; Uddin 2020; Xu 2017; Zhang 2018), although the majority of trial evidence overall remained from high-income settings (64/85, 75%).

Participants

People with MI alone were recruited in 40 trials (47%, 17,085 participants), with one trial (He 2020) recruiting people with MI in the absence of obstructive coronary artery disease (MINOCA). The remaining trials recruited people suffering exclusively from angina (5 trials, 6%, 368 participants), post-CABG patients (7 trials, 8%, 983 participants), post-PCI patients (7 trials, 8%, 1035 participants) or a mixed population of people with CHD (26 trials, 31%, 3959). Two trials included a mixed indication population, where more than 50% had a CHD diagnosis: one included 4 people (2%) who received valve replacement surgery (Snoek 2020). The inclusion of these people is unlikely to have implications for the findings. Additionally, Zwisler 2008 included people with congestive heart failure (12%), and those at high risk of ischaemic heart disease (30%). However, the authors kindly provided separate outcome data for the ischaemic heart disease population only. The mean age of participants within the trials ranged from 47 to 77 years. Although over half of the trials included women (62 trials, 73%), and in the last decade the median percentage of female participants has increased from 11% to 18%, women accounted for fewer than 15% of the participants recruited overall.

Interventions

Thirty-eight of the 85 (45%) trials involved exercise-only interventions, and 47 (55%) trials involved interventions comprised of multiple components. Of the 47 trial interventions that included other elements, 20 (43%) were made up of exercise plus education components; 16 (34%) were made up of exercise, education and psychosocial components; 7 (15%) were made up of exercise plus psychosocial components; and four (9%) were made up of exercise plus other components such as controlled diets or dietary advice, risk factor management, smoking cessation and relaxation. One study randomised participants to receive exercise only, exercise plus education, or usual care (Chaves 2019). One study compared exercise only, or exercise plus education plus psychosocial components, to usual care control (Sivarajan 1982).

The mode of exercise training in CR programmes was most often aerobic in nature and most commonly static cycling, walking or circuit training. Twenty-two (26%) trials specifically reported the inclusion of resistance training, most commonly in the form of weight training, callisthenics or exercises using elastic bands. The 'dose' of exercise intervention (dose (units) = number of weeks of exercise training x average number of sessions/week x average duration of session in minutes) ranged considerably across trials: overall dose (median 3540, range 450 to 32,760 units); frequency (1 to 7 sessions/week); session length (20 to 90 minutes/session); and intensity (50% to 90% of maximal heart rate, peak heart rate or heart rate reserve; 50% to 95% of maximal oxygen uptake (VO_2max); Borg rating of perceived exertion 11 to 16). Due to poor and inconsistent reporting of adherence and fidelity to exercise programmes in the RCTs, we were not able to consider the actual amount of exercise that the participants received or performed in this review.

Twenty-one studies (25%) were conducted in an exclusively home-based setting (Bäck 2008; Belardinelli 2001; Bell 1998; DeBusk 1994; Dorje 2019; Fletcher 1994; Haskell 1994; Heller 1993; Higgins 2001; Houle 2012; Lear 2015; Lewin 1992; Ma 2020; Maddison 2014; Miller 1984; Mutwalli 2012; Oerkild 2012; Reid 2012; Snoek 2020; Uddin 2020; Wang 2012), with four of these studies randomising participants to usual care, or to an electronically-delivered intervention designed with an element of personally

tailored or structured exercise, accessed via a mobile phone or the Internet (Dorje 2019; Lear 2015; Maddison 2014; Reid 2012).

Comparators

In general, comparator groups were described as receiving usual or standard care (50/85, 59%). Twenty-four trials (28%) reported participants in the control groups receiving usual care plus education, guidance or advice about diet, exercise, or physical activity from medical professionals or via information leaflets, but no formal exercise training. Eight trials (9%) reported participants in the control group simply received “no exercise”. One trial compared exercise training to stent angioplasty for participants with stable angina (Hambrecht 2004), while another compared exercise training to an "early return to normal activities group", where participants returned to work two weeks following a myocardial infarction, without a formal CR programme (Kovoor 2006). A third trial provided participants in the control group with blinded pedometers and instructions about how to wear the pedometer correctly during seven consecutive days from morning to bedtime (Houle 2012).

Outcomes

Eighty studies (94%) measured and reported outcomes that were used in at least one quantitative analysis (meta-analysis or vote-counting for HRQoL and cost-effectiveness). One study reported clinical events as part of a composite outcome (Byrkjeland 2015). Two studies indicated that outcomes of interest were measured but did not report the results (Pomeshkina 2017; Pomeshkina 2019); triallists did not respond to our requests for data.

Funding

Fifty trials (59%) were funded by not-for-profit organisations, one trial (1%) was funded by industry, and six trials (7%) were funded by a combination of industry and not-for-profit organisations. Twenty-eight trials (33%) did not report funding sources.

Excluded studies

We excluded 201 publications identified in the current search, for reasons listed in the Characteristics of excluded studies table. The most common reasons for exclusion were associated with study design, which included insufficient follow-up time, or that the study was not a randomised controlled trial, or the comparator intervention included an exercise component.

We describe 15 ongoing trials which meet the inclusion criteria of this review in the Characteristics of ongoing studies table. Fourteen studies are awaiting classification, pending clarification from the authors regarding study characteristics (see Characteristics of studies awaiting classification).

Risk of bias in included studies

The overall risk of bias was low or unclear (Figure 2). A number of trials failed to give sufficient detail to assess their potential risk of bias, although the quality of reporting has generally improved over the last decade, with the percentage of studies with less than three low risk of bias domains decreased from 80% to 55% over the last decade.

Figure 2. Risk of bias summary: review authors' judgements about each risk of bias item for each included study

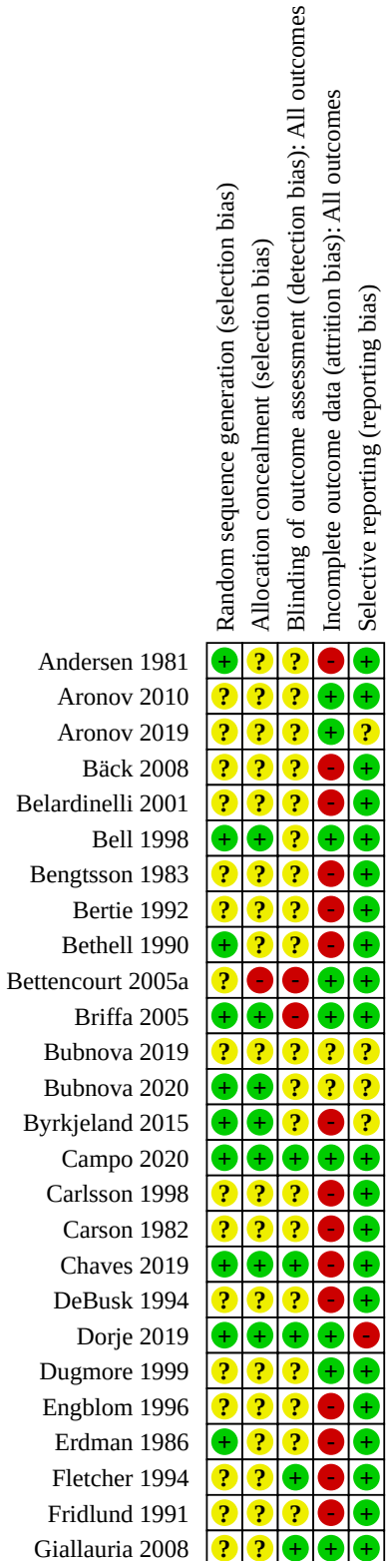


Figure 2. (Continued)

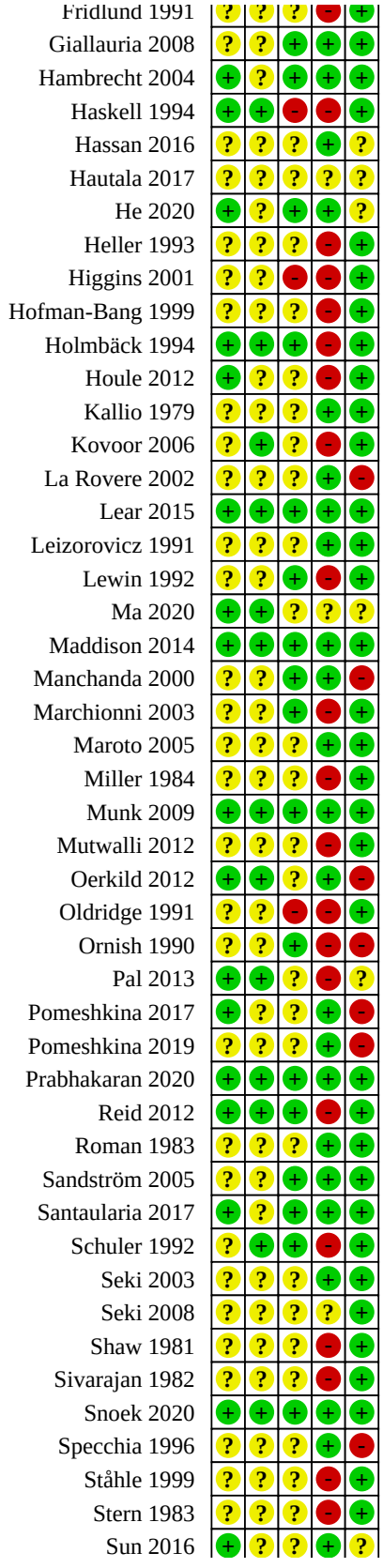
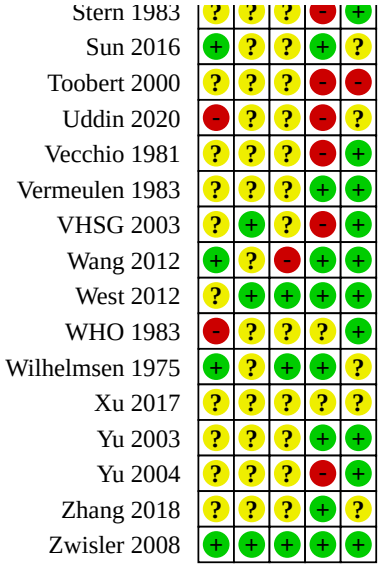


Figure 2. (Continued)



Allocation

All the trial publications reported that the trial was 'randomised', but many provided insufficient detail to assess whether the method was appropriate. A total of 30/85 (35%) studies reported details of appropriate generation of the random sequence (Andersen 1981; Bell 1998; Bethell 1990; Briffa 2005; Bubnova 2020; Byrkjeland 2015; Campo 2020; Chaves 2019; Dorje 2019; Erdman 1986; Hambrecht 2004; Haskell 1994; He 2020; Holmbäck 1994; Houle 2012; Lear 2015; Ma 2020; Maddison 2014; Munk 2009; Oerkild 2012; Pal 2013; Pomeshkina 2017; Prabhakaran 2020; Reid 2012; Santaularia 2017; Snoek 2020; Sun 2016; Wang 2012; Wilhelmsen 1975; Zwisler 2008), and 23/85 (27%) studies reported appropriate concealment of allocation (Bell 1998; Briffa 2005; Bubnova 2020; Byrkjeland 2015; Campo 2020; Chaves 2019; Dorje 2019; Haskell 1994; Holmbäck 1994; Kovoor 2006; Lear 2015; Ma 2020; Maddison 2014; Munk 2009; Oerkild 2012; Pal 2013; Prabhakaran 2020; Reid 2012; Schuler 1992; Snoek 2020; VHSG 2003; West 2012; Zwisler 2008). One study used quasi-randomisation methods (Uddin 2020), allocating participants to CR or usual care according to the week of surgery for participants.

Blinding

Given the nature of the exercise-based CR intervention, it is not possible to blind participants or programme personnel.

Only 24/85 studies (28%) reported adequate details of blinding of outcome assessment (Campo 2020; Chaves 2019; Dorje 2019; Fletcher 1994; Giallauria 2008; Hambrecht 2004; He 2020; Holmbäck 1994; Lear 2015; Lewin 1992; Maddison 2014; Manchanda 2000; Marchionni 2003; Munk 2009; Ornish 1990; Prabhakaran 2020; Reid 2012; Sandström 2005; Santaularia 2017; Schuler 1992; Snoek 2020; West 2012; Wilhelmsen 1975; Zwisler 2008).

Incomplete outcome data

Although losses to follow-up and dropout were relatively high in some studies (up to 48% in trials where losses to follow-up were reported), follow-up of 80% or more was achieved in 59/85 (69%) studies (Andersen 1981; Aronov 2010; Aronov 2019; Bäck 2008; Belardinelli 2001; Bell 1998; Bethell 1990; Bettencourt 2005a; Briffa 2005; Campo 2020; Carlsson 1998; Dorje 2019; Dugmore 1999; Engblom 1996; Giallauria 2008; Hambrecht 2004; Haskell 1994; Hassan 2016; He 2020; Heller 1993; Holmbäck 1994; Kallio 1979; La Rovere 2002; Lear 2015; Leizorovicz 1991; Lewin 1992; Ma 2020; Maddison 2014; Manchanda 2000; Marchionni 2003; Maroto 2005; Miller 1984; Munk 2009; Oerkild 2012; Oldridge 1991; Pomeshkina 2017; Pomeshkina 2019; Prabhakaran 2020; Roman 1983; Sandström 2005; Schuler 1992; Seki 2003; Shaw 1981; Snoek 2020; Specchia 1996; Ståhle 1999; Stern 1983; Toobert 2000; Vermeulen 1983; VHSG 2003; Wang 2012; West 2012; Wilhelmsen 1975; Yu 2003; Zhang 2018; Zwisler 2008). However, reasons for loss to follow-up and dropout were often not reported. We judged only 38/85 (44%) studies to have adequately reported reasons for loss to follow-up and whether there were systematic differences between groups with respect to missing data, thus having a low risk of bias. We judged 40/85 (47%) studies as having a high risk of bias, and seven studies as having an unclear risk of bias.

Selective reporting

The majority (62/85; 73%) of trials reported all outcomes listed in their methods sections, or that were prespecified in the study protocol or trial registration (Campo 2020; Chaves 2019; Dorje 2019; Fridlund 1991; Prabhakaran 2020; Santaularia 2017; Snoek 2020). Nine trials failed to report all outcomes at all time points collected (Dorje 2019; La Rovere 2002; Manchanda 2000; Oerkild 2012; Ornish 1990; Pomeshkina 2017; Pomeshkina 2019; Specchia 1996; Toobert 2000), and we judged 11 studies as having an unclear risk of bias as their methods sections did not clearly describe the outcomes to be collected (Aronov 2019; Bubnova 2019; Bubnova 2020; Byrkjeland 2015; Hassan 2016; Hautala 2017; He 2020; Ma 2020; Pal 2013; Sun 2016; Uddin 2020; Wilhelmsen 1975; Xu 2017; Zhang 2018). A number of the included studies were not designed to assess treatment group differences in morbidity and mortality (as these were not the primary outcomes of these trials) and, therefore, may

not have fully reported all clinical events that occurred during the follow-up period.

Other potential sources of bias

We did not find any other potential sources of bias amongst the studies.

Effects of interventions

See: **Summary of findings 1** Exercise-based cardiac rehabilitation compared to 'no exercise' control for coronary heart disease

Where data were available, we have presented pooled outcomes at three follow-up timings: short-term (6 to 12 months); medium-term (> 12 to 36 months); and long-term (> 36 months).

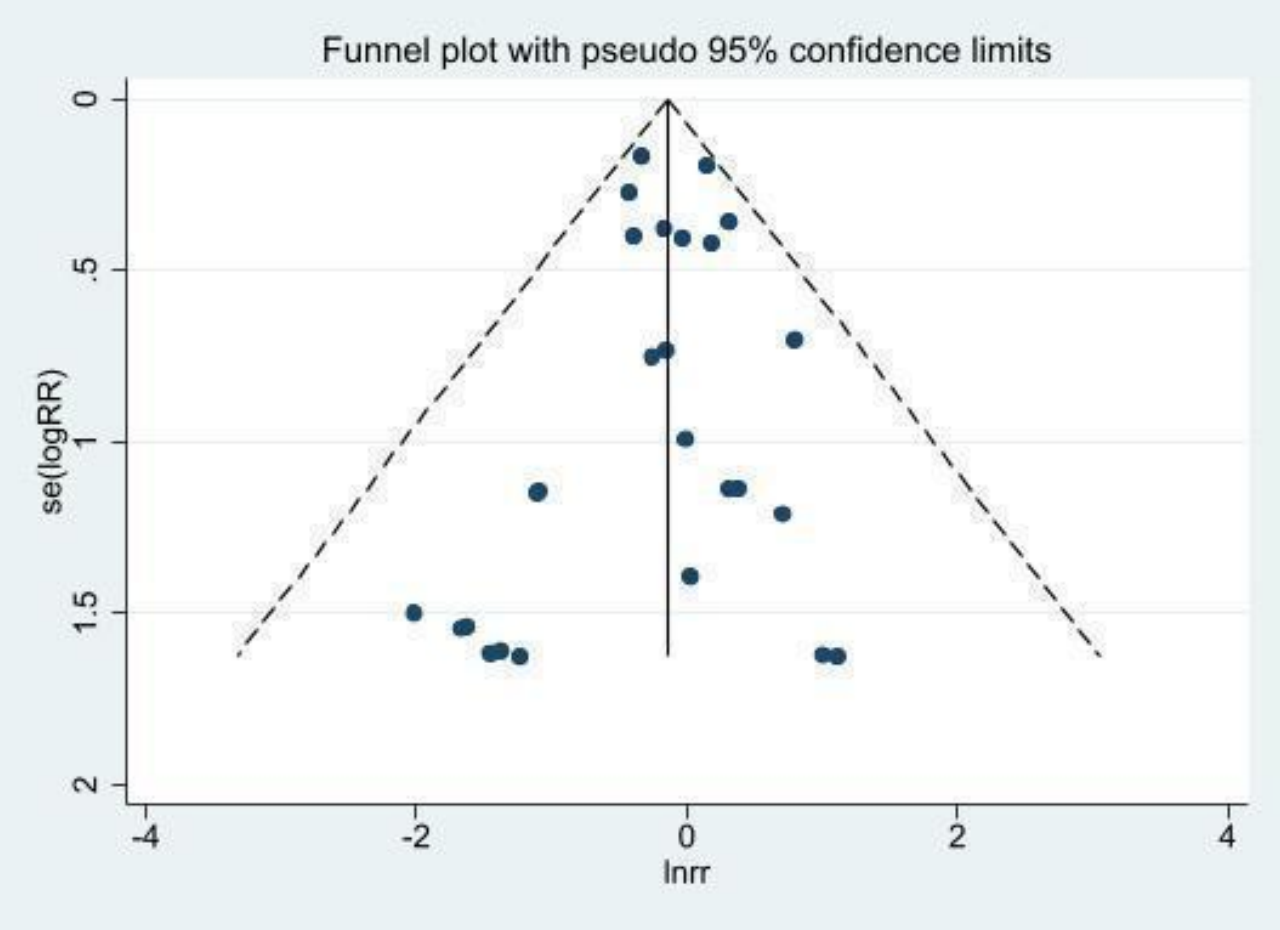
Primary outcomes

All-cause mortality

Sixty-one of the 85 included studies (72%) reported all-cause mortality (Analysis 1.1). Four trials contributed mortality data at more than one follow-up period (Shaw 1981; West 2012; WHO 1983; Wilhelmsen 1975). Fourteen trials reported zero events in both the intervention and control groups up to 12 months' follow-up (Aronov 2019; Byrkjeland 2015; Chaves 2019; Hambrecht 2004; Houle 2012; Kovoor 2006; Maddison 2014; Manchanda 2000; Munk 2009; Pomeshkina 2017; Pomeshkina 2019; Santaularia 2017; Seki 2008; Zhang 2018).

Compared with 'no exercise' control, exercise-based CR likely results in a slight reduction in all-cause mortality up to 12 months' follow-up (RR 0.87, 95% CI 0.73 to 1.04; I^2 = 0%; 25 trials, 26 comparisons, 8823 participants). The certainty of the evidence was moderate due to imprecision, with a wide confidence interval. There was no evidence of publication bias for all-cause mortality up to 12 months' follow-up (Figure 3; Egger test: P = 0.50).

Figure 3. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: all-cause mortality at 6 to 12 months' follow-up



At medium- and long-term follow-up, exercise-based CR may result in little to no difference in all-cause mortality (medium-term: RR 0.90, 95% CI 0.80 to 1.02; I^2 = 0%; 16 trials, 11,073 participants; long-term: RR 0.91, 95% CI 0.75 to 1.10; I^2 = 35%; 11 trials, 3828 participants). There was no evidence of publication bias for all-cause mortality at medium- or long-term follow-up (Figure 4; Egger test: P = 0.54; Figure 5; Egger test: P = 0.15, respectively).

Figure 4. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: all-cause mortality at > 36 months' follow-up

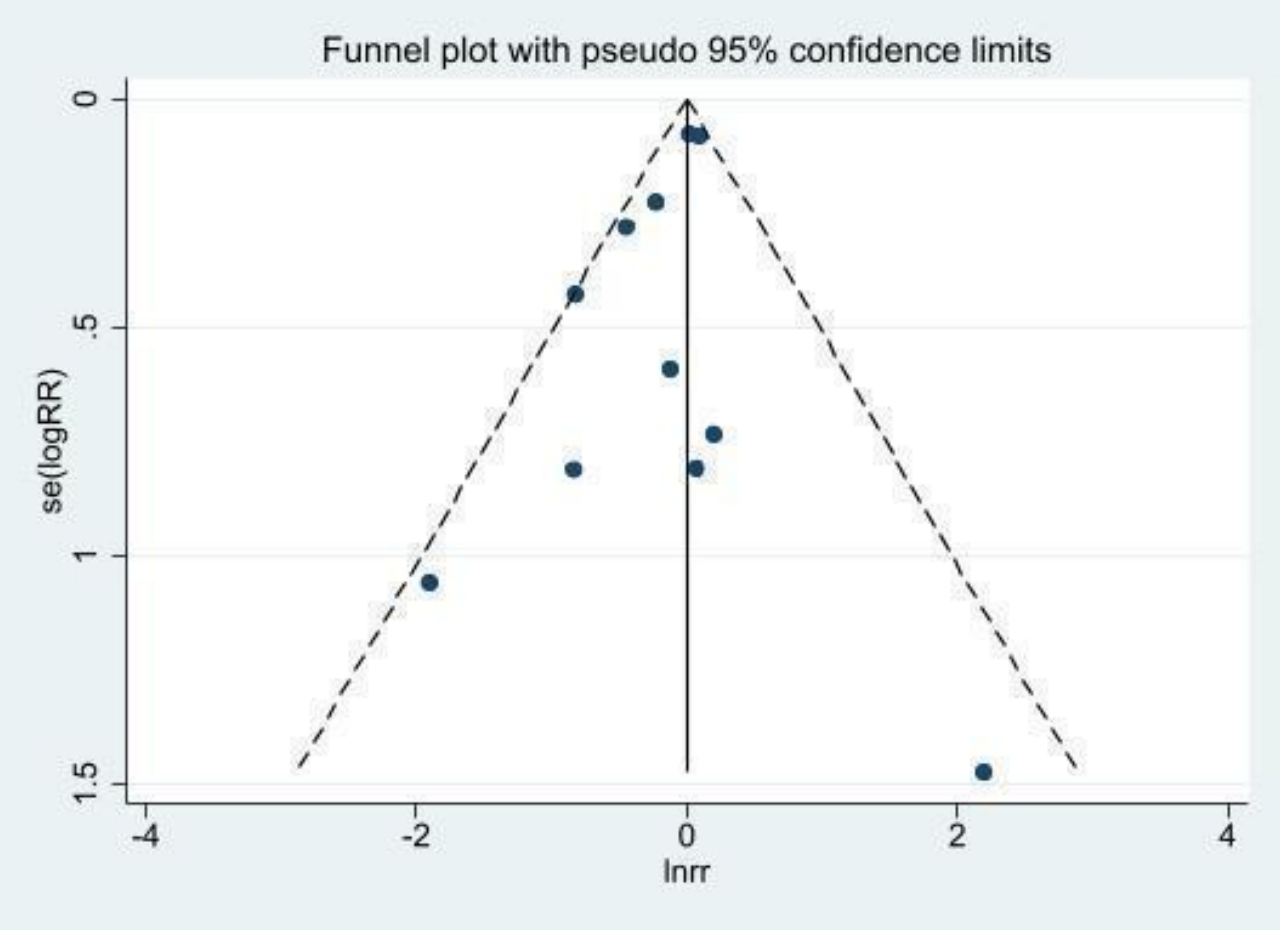
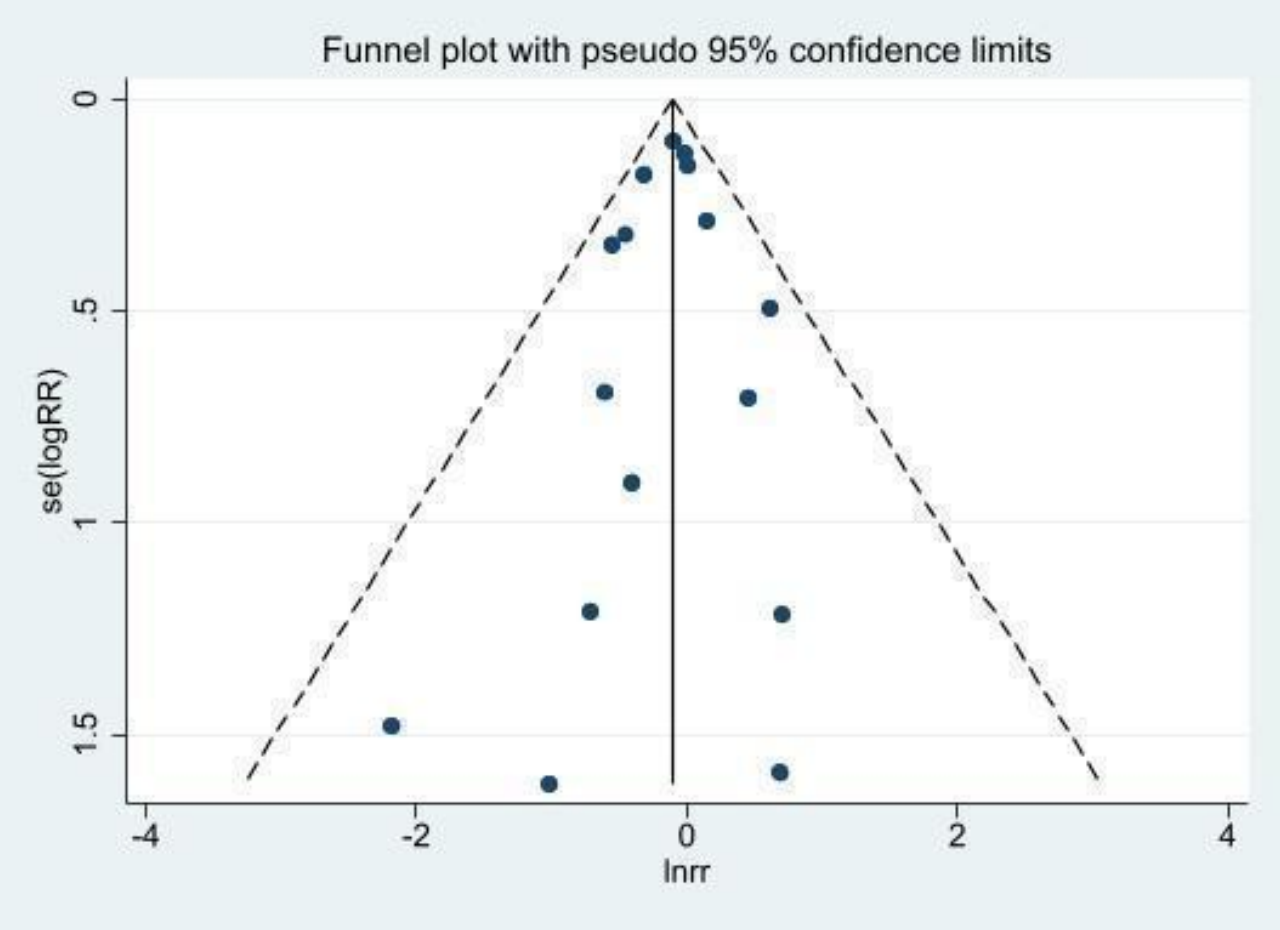


Figure 5. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: all-cause mortality at > 12 to 36 months' follow-up

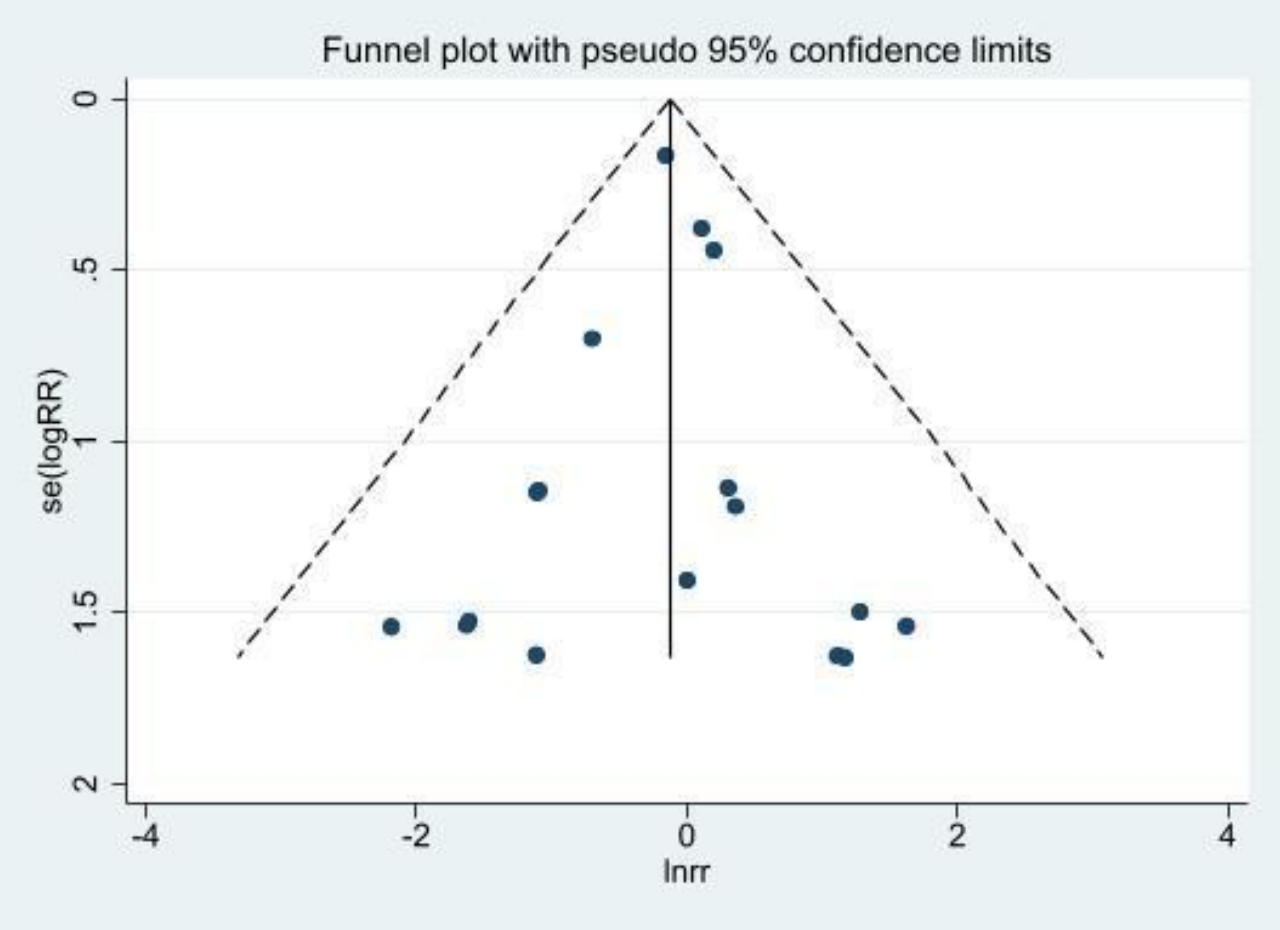


Cardiovascular mortality

Thirty-three of the 85 trials (39%) reported cardiovascular mortality (Analysis 1.2). One trial reported both short- and medium-term follow-up (WHO 1983). Up to 12 months' follow-up, five trials reported zero events in both the intervention and control group (Byrkjeland 2015; Chaves 2019; Maddison 2014; Munk 2009; Seki 2008). At medium-term follow-up, one trial reported zero events in both the intervention and control groups (Belardinelli 2001).

Exercise-based CR likely results in little to no difference in cardiovascular mortality up to 12 months' follow-up (RR 0.88, 95% CI 0.68 to 1.14; I^2 = 0%; 15 trials, 5360 participants). This result may be driven by the WHO 1983 trial which carries the majority of the weight. The certainty of the evidence was moderate due to imprecision, with a wide confidence interval. There was no evidence of publication bias for cardiovascular mortality (Figure 6; Egger test: P = 0.76).

Figure 6. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.2: cardiovascular mortality at 6 to 12 months' follow-up



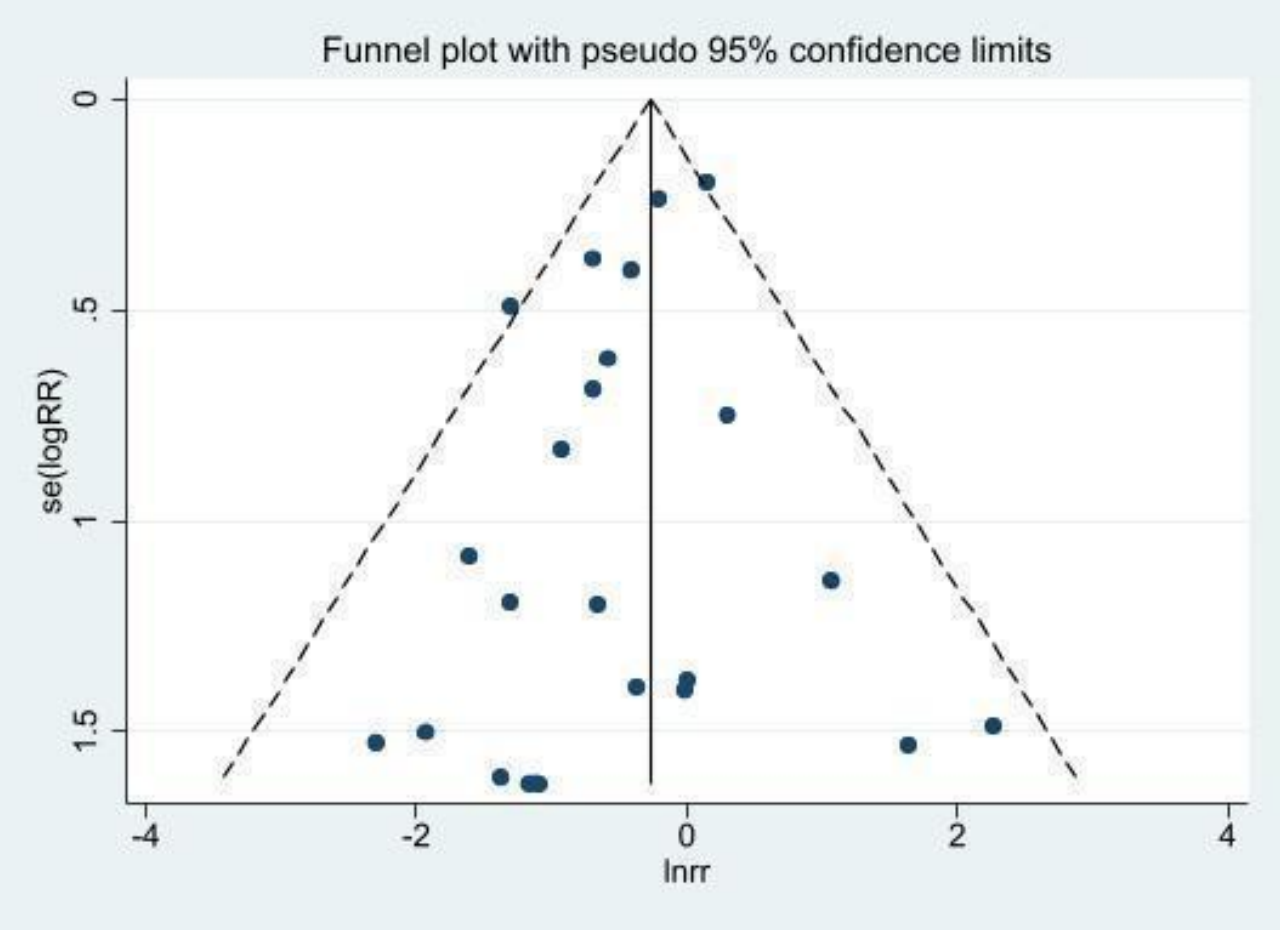
However, at medium-term follow-up, evidence suggests exercise-based CR results in a large reduction in cardiovascular mortality (RR 0.77, 95% CI 0.63 to 0.93; I^2 = 5%; 5 trials, 3614 participants), but again, this result may be driven by the WHO 1983 trial which accounts for the majority of the weight. Similarly, at long-term follow-up, evidence suggests a large reduction in cardiovascular mortality (RR 0.58, 95% CI 0.43 to 0.78; I^2 = 0%; 8 trials, 1392 participants).

Fatal or non-fatal myocardial infarction

Forty-two of the 85 trials (49%) reported the risk of fatal or non-fatal MI (Analysis 1.3). Three trials reported zero events in both the intervention and control groups up to 12 months' follow-up (Maddison 2014; Reid 2012; Seki 2008). Five studies contributed MI data at multiple follow-up time points (Hambrecht 2004; Haskell 1994; Hofman-Bang 1999; West 2012; WHO 1983).

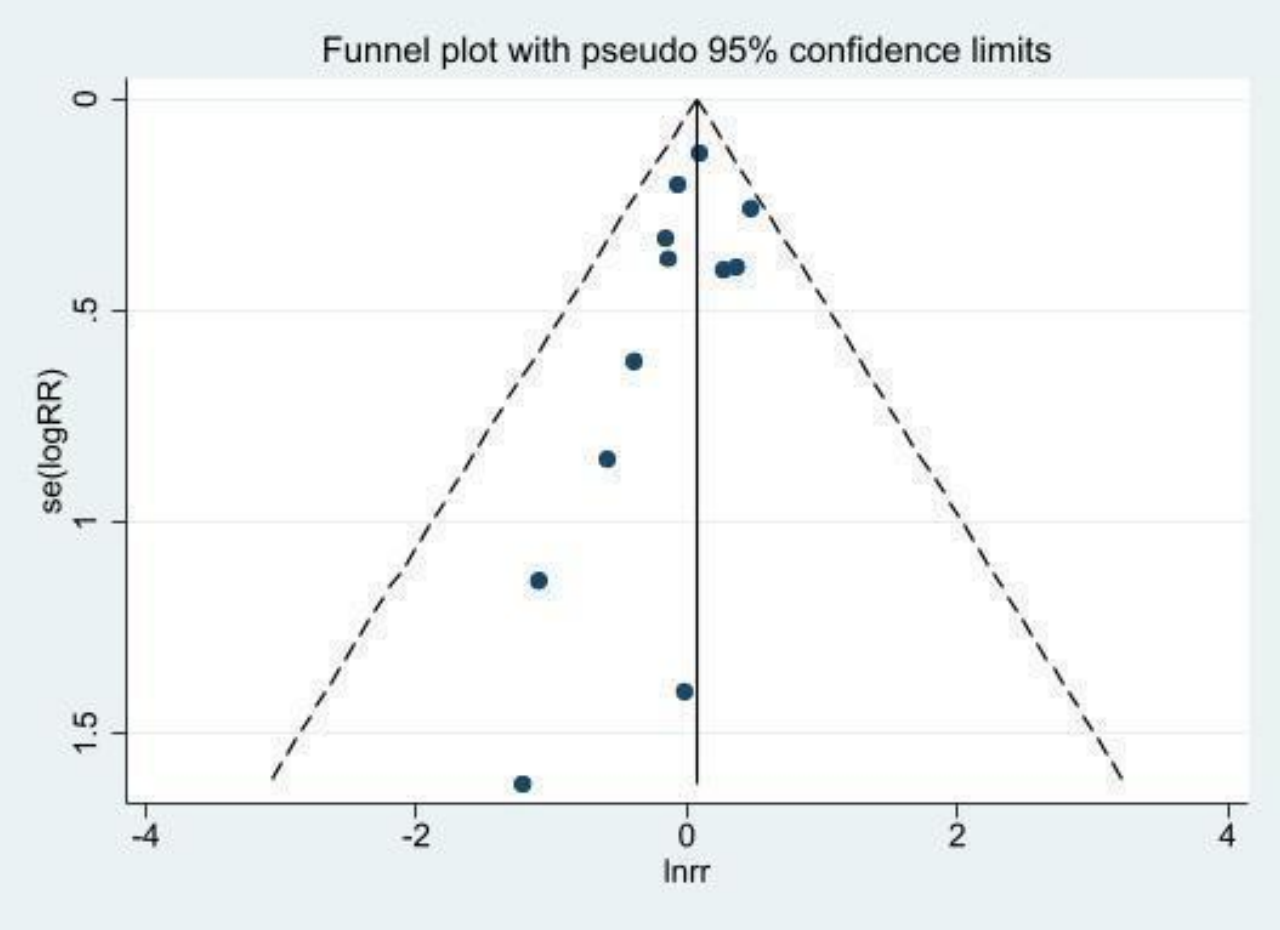
Exercise-based CR likely results in a large reduction in fatal or non-fatal MI up to 12 months' follow-up (RR 0.72, 95% CI 0.55 to 0.93; I^2 = 7%; 22 trials, 24 comparisons, 7423 participants). The NNTB is 75 (95% CI 47 to 298), meaning one additional MI could be prevented up to 12 months for every 75 people participating in exercise-based CR. The certainty of the evidence was high, and there was no evidence of publication bias (Figure 7; Egger test: P = 0.12).

Figure 7. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.3: myocardial infarction at 6 to 12 months' follow-up



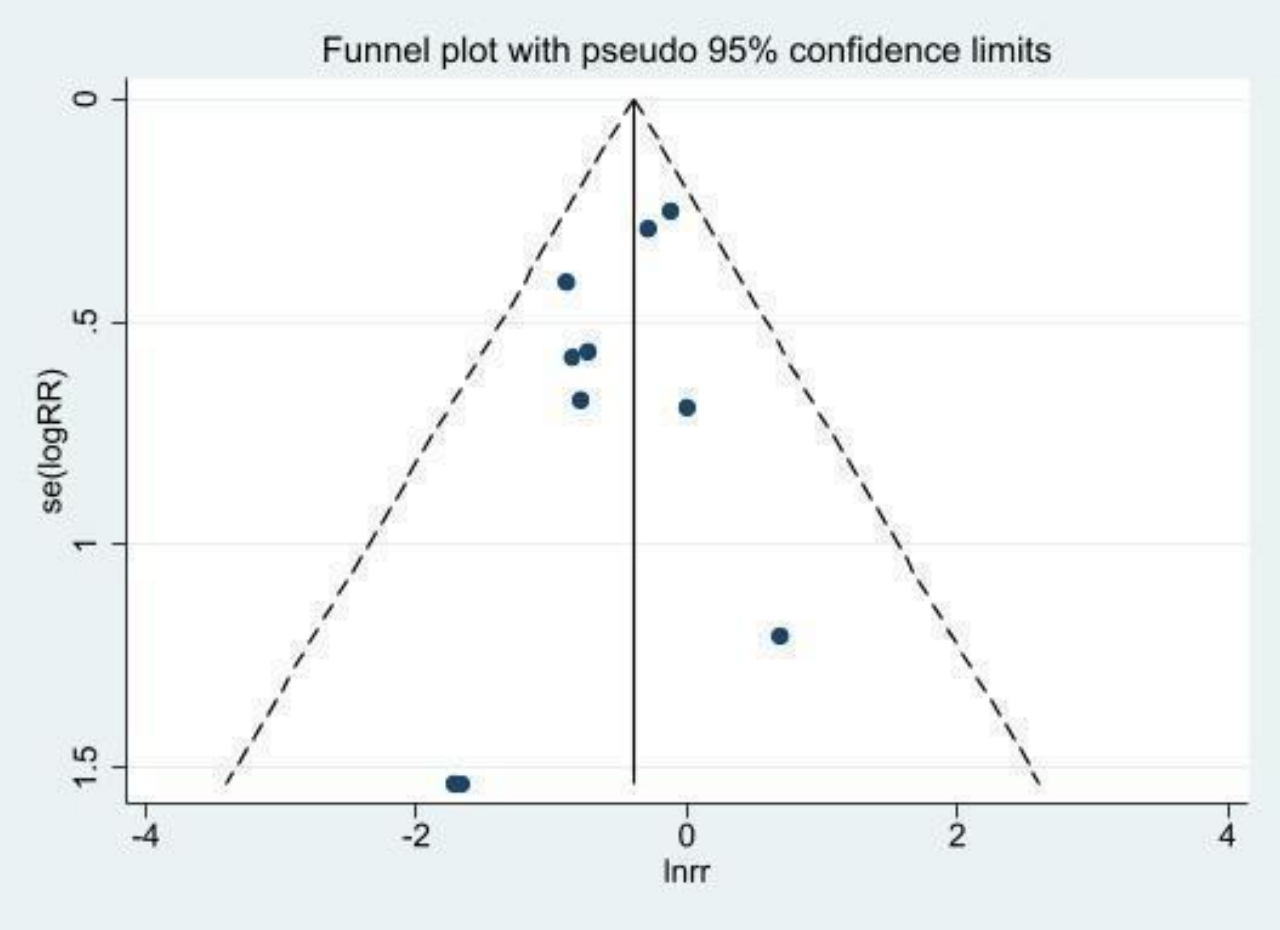
The evidence suggests there may be little to no difference for risk of MI with exercise-based CR at medium-term follow-up (RR 1.07, 95% CI 0.91 to 1.27, I^2 = 0%; 12 trials, 9565 participants), which may be driven by the WHO 1983 study which carries more weight than other studies included in this analysis. There was no evidence of publication bias at medium-term follow-up (Figure 8; Egger test: P = 0.18).

Figure 8. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: myocardial infarction at > 12 to 36 months' follow-up



At long-term follow-up, the evidence suggests that exercise-based CR results in a large reduction in risk of fatal or non-fatal MI (RR 0.67, 95% CI 0.50 to 0.90; I^2 = 0%; 10 trials, 1560 participants). There was no evidence of publication bias at long-term follow-up (Figure 9; Egger test: P = 0.19).

Figure 9. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: myocardial infarction at > 36 months' follow-up

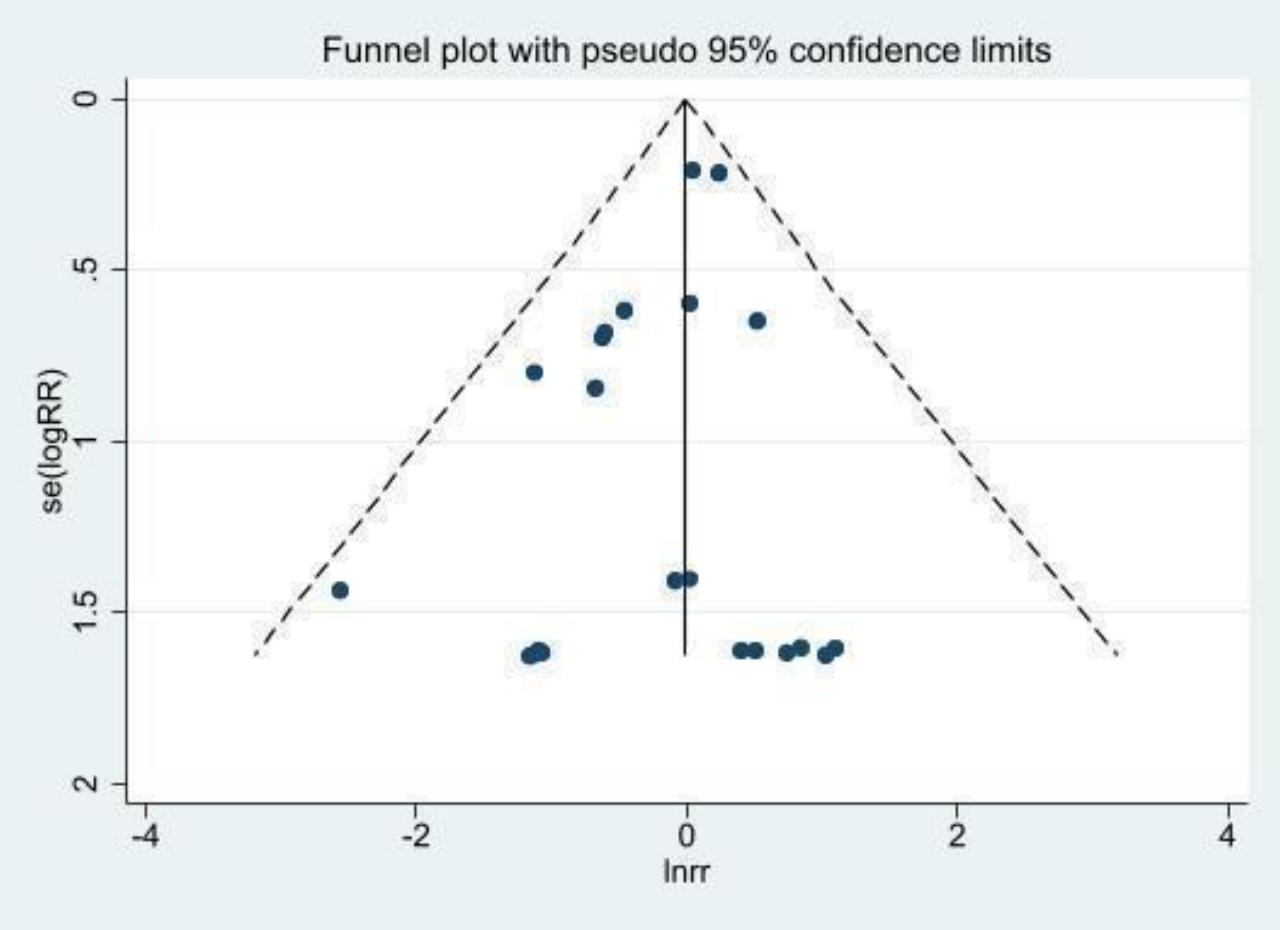


Revascularisation - CABG

Thirty-one of the 85 included trials (36%) reported the risk of CABG (Analysis 1.4). Four studies contributed CABG data at multiple follow-up time points (Haskell 1994; Hofman-Bang 1999; Stahle 1999; West 2012). Two studies reported zero events in both the intervention and control groups up to 12 months' follow-up (Maddison 2014; Seki 2008).

There was little to no difference between exercise-based CR and 'no exercise' control for CABG up to 12 months' follow-up (RR 0.99, 95% CI 0.78 to 1.27; I^2 = 0%; 20 trials, 22 comparisons, 4473 participants). The certainty of evidence was high, and there was no evidence of publication bias for CABG at short-term follow-up (Figure 10; Egger test: P = 0.10).

Figure 10. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: CABG at 6 to 12 months' follow-up



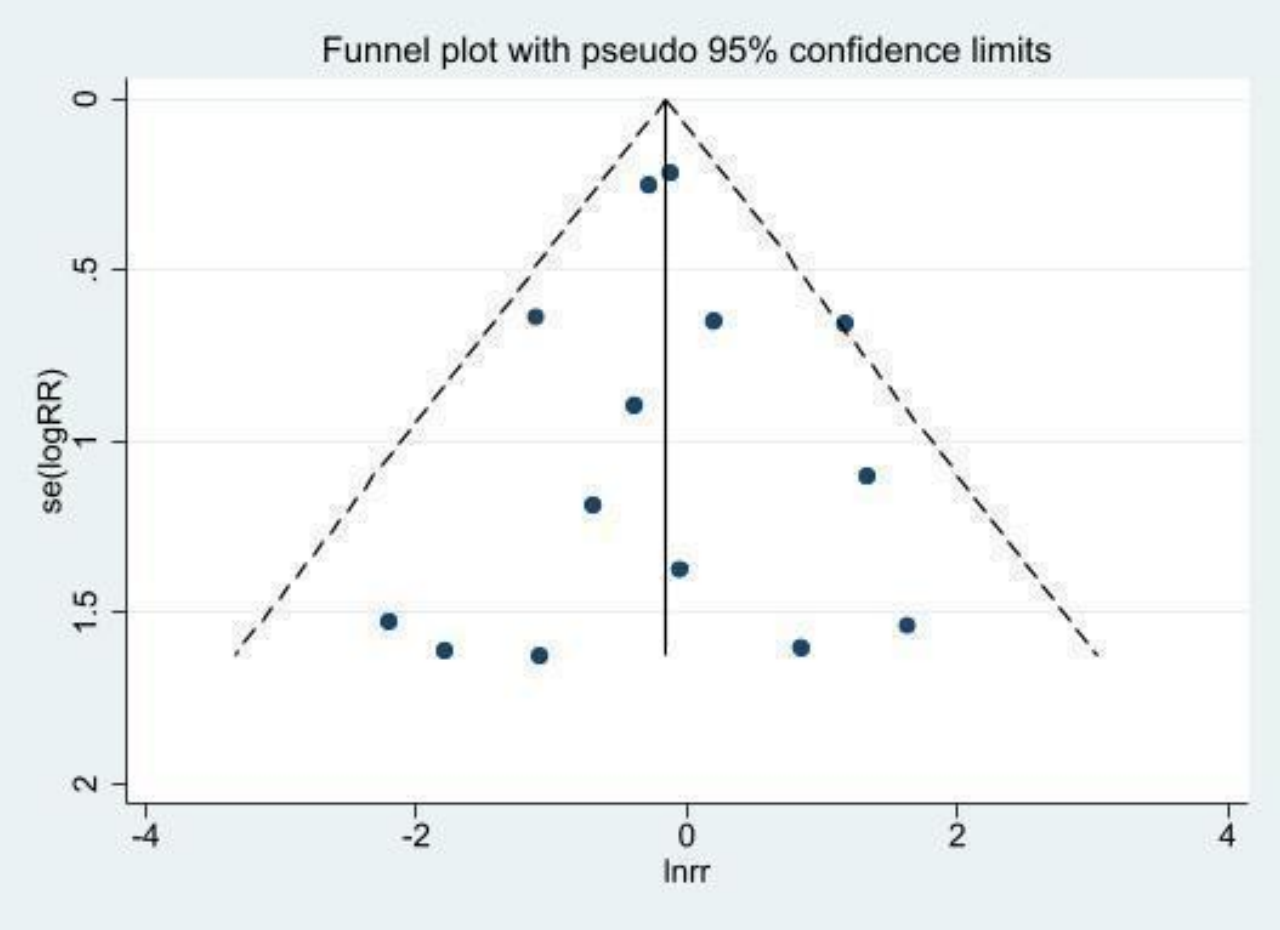
Similarly, at medium-term follow-up, evidence suggests little to no difference between exercise-based CR and 'no exercise' control in risk of CABG (RR 0.97, 95% CI 0.77 to 1.23; I^2 = 0%; 9 trials, 2826 participants), whereas across the small number of studies reporting CABG at long-term follow-up, evidence was uncertain about the effect of exercise-based CR on risk of CABG, with a wide 95% CI including considerable benefit and harm (RR 0.66, 95% CI 0.34 to 1.27; I^2 = 18%; 4 trials, 675 participants).

Revascularisation - PCI

Twenty-one of the 85 included trials (25%) reported the risk of PCI (Analysis 1.5). Four studies contributed PCI data at multiple follow-up time points (Haskell 1994; Hofman-Bang 1999; Stahle 1999; West 2012). Three studies reported zero events in both the intervention and control groups up to 12 months' follow-up (Maddison 2014; Reid 2012; Seki 2008).

Exercise-based CR likely results in little to no difference in PCI up to 12 months' follow-up (RR 0.86, 95% CI 0.63 to 1.19; I^2 = 7%; 13 trials, 14 comparisons, 3465 participants). The certainty of evidence was moderate due to imprecision, with wide confidence intervals. There was no evidence of publication bias for PCI at short-term follow-up (Figure 11; Egger test: P = 0.94).

Figure 11. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: PCI at 6 to 12 months' follow-up



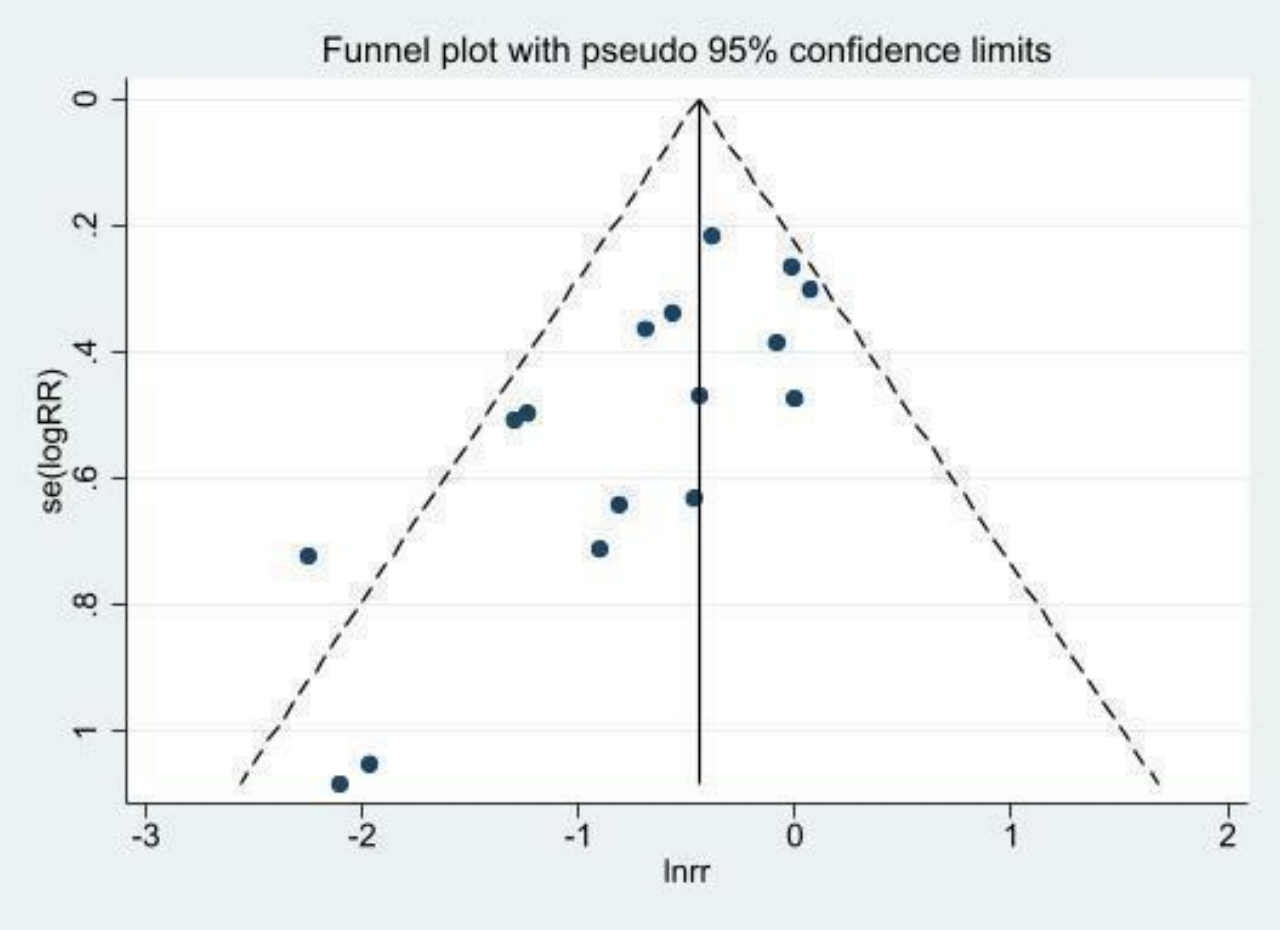
At medium-term and long-term follow-up, the evidence is uncertain whether there is a benefit for risk of PCI with exercise-based CR as the 95% CI is consistent with possible benefit and possible harm (medium-term: RR 0.96, 95% CI 0.69 to 1.35; I^2 = 26%; 6 trials, 1983 participants; long-term: RR 0.76, 95% CI 0.48 to 1.20; I^2 = 0%; 3 trials, 567 participants).

All-cause hospitalisation

Twenty-three of the 85 included studies (27%) reported all-cause hospital admissions (Analysis 1.6). One study reported follow-up at both short- and medium-term (Hofman-Bang 1999). One trial reported zero events in both the intervention and control groups at up to 12 months' follow-up (Maddison 2014). No trials reported hospitalisation data at long-term follow-up.

Exercise-based CR probably results in a large reduction in all-cause hospital admissions up to 12 months' follow-up (RR 0.58, 95% CI 0.43 to 0.77; I^2 = 42%; 14 trials, 16 comparisons, 2030 participants). The NNTB is 12 (95% CI 9 to 21) meaning one additional hospital admission for any cause could be prevented up to 12 months for every 12 people participating in exercise-based CR. The certainty of evidence was moderate, downgraded because of evidence of publication bias (Figure 12; Egger test: P = 0.003).

Figure 12. Funnel plot of comparison: exercise-based rehabilitation versus usual care, outcome 1.1: all-cause hospitalisation at 6 to 12 months' follow-up



At medium-term follow-up, evidence suggests exercise-based CR may result in little to no difference in all-cause hospitalisation (RR 0.92, 95% CI 0.82 to 1.03; I^2 = 0%; 9 trials, 5995 participants).

Cardiovascular hospitalisation

Eight studies reported cardiovascular hospital admissions (Analysis 1.7). One study contributed cardiovascular hospital admission data over two follow-up time points (Haskell 1994). No trials reported data at long-term follow-up. Definitions of cardiovascular hospitalisation differed somewhat between trials (Campo 2020: hospitalisations for a cardiovascular cause (acute coronary syndrome (ACS), cerebrovascular accident, heart failure, chronic coronary syndrome; Hambrecht 2004: hospitalisation and coronary angiography owing to worsening angina; Haskell 1994: cardiac events initiating hospitalisation (death, MI, CABG, percutaneous transluminal coronary angioplasty (PTCA)); Mutwalli 2012: elevated heart rate, deep sternal infection and heart attack; Reid 2012: rehospitalised with chest pain; Snoek 2020: hospitalisation for cardiac reasons (chronic coronary syndrome, ACS, pacemaker, PCI, endocarditis, dyspnoea); VHSG 2003: chest pain without objective evidence of ischaemia; Zwisler 2008: acute first-time readmissions due to heart disease).

We are uncertain whether exercise-based CR may result in reduced risk of cardiovascular hospital admissions up to 12 months' follow-up (RR 0.80, 95% CI 0.41 to 1.59; I^2 = 53%; 6 trials, 1087 participants). The certainty of evidence was low due to evidence of substantial heterogeneity and a wide confidence interval including considerable benefit as well as harm.

Similarly, evidence is uncertain in risk of cardiovascular hospitalisation in the few studies that reported medium-term follow-up (RR 0.92, 95% CI 0.76 to 1.12; I^2 = 0%; 3 trials, 943 participants). There were insufficient studies to assess publication bias.

Secondary outcomes

Health-related quality of life

Fifteen trials (18%) measured HRQoL at short-term follow-up using the same validated measure and reported outcomes on the same scale, enabling meta-analyses using MD to be performed. For each of these validated measures, an increase in score indicates improvement in HRQoL. There were not enough data reported across trials at medium- and long-term follow-up for meta-analysis to be performed.

Six studies (1731 participants) reported the SF-36 summary scores (physical component score (PCS) and mental component score (MCS) at short-term follow-up (Analysis 1.8). Exercise-based CR may slightly increase PCS compared to 'no exercise' control (MD 1.70,

95% CI -0.08 to 3.47; P = 0.06; 6 trials) and likely increases MCS (MD 2.14, 95% CI 1.07 to 3.22; 6 trials) up to 12 months' follow-up. However, it is unclear whether these improvements are clinically meaningful. There was evidence of substantial heterogeneity for PCS (I^2 = 73%, P = 0.002), but not for MCS (I^2 = 21%).

Eight studies (2812 participants) reported SF-36 individual domain scores (physical functioning, physical performance, bodily pain, general health, vitality, social functioning, emotional performance, mental health) at short-term follow-up (Analysis 1.9). One study did not report scores for the vitality and emotional performance domains (Belardinelli 2001). Exercise-based CR may result in an increase in six out of eight domains: physical functioning score (MD 8.47, 95% CI 3.69 to 13.24); physical performance (MD 8.08, 95% CI 2.89 to 13.27); general health (MD 5.66, 95% CI 2.08 to 9.25); vitality (MD 5.78, 95% CI 1.89 to 9.67); social functioning (MD 1.98, 95% CI 0.26 to 3.70; I^2 = 20%); and mental health (MD 5.60, 95% CI 1.21 to 9.98). There was no difference in the domains bodily pain (MD -0.06, 95% CI -8.97 to 8.84) and emotional performance (MD 0.69, 95% CI -1.33 to 2.71; I^2 = 18%). There was evidence of substantial heterogeneity for the following domains: physical functioning (I^2 = 92%, P < 0.001); physical performance (I^2 = 87%, P < 0.001); bodily pain (I^2 = 97%, P < 0.001); general health (I^2 = 84%, P < 0.001); vitality (I^2 = 85%, P < 0.001); and mental health (I^2 = 93%, P < 0.001). Based on the minimally important clinical differences reported by Wyrwich 2004, the increases in each of the domains are not clinically important.

Three studies (476 participants) reported EQ-5D visual analogue scores at short-term follow-up (Analysis 1.10). Exercise-based CR may increase EQ-5D scores up to 12 months' follow-up (MD 0.05, 95% CI -0.01 to 0.10; P = 0.08). There was evidence of substantial heterogeneity (I^2 = 69%, P = 0.04). The increase in EQ-5D could potentially be clinically meaningful (Briggs 2017).

In addition to the meta-analyses, given both the heterogeneity in HRQoL outcome measures and methods of reporting findings, a vote-counting method was used to summarise descriptive data and direction of effect for all the studies that reported HRQoL (Table 1; Campbell 2020). Thirty-two of the 85 trials (38%, N = 7680 participants) assessed HRQoL using a range of validated generic (e.g. SF-36) or disease-specific (e.g. HeartQoL) outcome measures. Thirty of these trials reported HRQoL data at short-term follow-up, three reported HRQoL data at medium-term follow-up, and only one trial reported HRQoL data at long-term follow-up. Although most trials demonstrated an improvement in HRQL at follow-up compared to baseline following exercise-based CR, a within-group improvement was also often reported in control participants. Twenty trials reported higher levels of HRQoL in one or more subscales with exercise-based CR compared to control at short-term follow-up (Belardinelli 2001; Bettencourt 2005a; Briffa 2005; Bubnova 2019; Bubnova 2020; Campo 2020; Hassan 2016; Hautala 2017; He 2020; Heller 1993; Hofman-Bang 1999; Houle 2012; Ma 2020; Maddison 2014; Mutwalli 2012; Reid 2012; Santaularia 2017; Uddin 2020; Wang 2012; Yu 2003), with three at medium-term follow-up (Bell 1998; Toobert 2000; Yu 2003), and one at long-term follow-up (Engblom 1996). In twelve trials, there was evidence of a significantly higher level of quality of life in most (> 50%) of the subscales at short-term follow-up only (Belardinelli 2001; Bell 1998; Bubnova 2019; Bubnova 2020; Campo 2020; Hassan 2016; Hautala 2017; Ma 2020; Mutwalli 2012; Reid 2012; Uddin 2020; Wang 2012).

Costs and cost-effectiveness

Eight of the included studies reported data on costs of CR and overall healthcare costs in both groups (Briffa 2005; Hambrecht 2004; Hautala 2017; Kovoor 2006; Maddison 2014; Marchionni 2003; Oldridge 1991/Oldridge 1993; Yu 2004). These results are summarised in Table 2. While it was not possible to directly compare costs across studies due to differences in currencies and the timing of studies, it is possible to compare the within-study costs for CR and control groups. Three studies showed no difference in total healthcare costs between groups (Briffa 2005; Kovoor 2006; Yu 2004); two studies found healthcare costs for CR to be lower (USD 2378 less per participant; EUR 1083 less per participant) compared to control (Hambrecht 2004; Hautala 2017); one study reported the healthcare costs for CR to be higher (USD 4839 more per participant) than usual care (Marchionni 2003); while two studies did not report total healthcare costs (Maddison 2014; Oldridge 1991/Oldridge 1993).

Five studies also reported cost-effectiveness using a cost utility approach (i.e. cost per quality-adjusted life year (QALY)) (Briffa 2005; Hautala 2017; Oldridge 1991/Oldridge 1993; Maddison 2014; Yu 2004). Two studies showed CR (compared to control) to be economically dominant; that is, associated with more QALYs and less overall costs (Hautala 2017; Yu 2004). In the remaining three studies, the incremental cost ratio compared to control was USD 42,535 per QALY (Briffa 2005), EUR 15,247 per QALY (Maddison 2014), and USD 9200 per QALY (Oldridge 1991/Oldridge 1993). Based on these analyses, authors consistently concluded CR to be a cost-effective use of healthcare resources compared to usual care.

Meta-regression

We examined predictors of total mortality, cardiovascular mortality, recurrent MI, revascularisation (CABG and PCI) and all-cause hospitalisation across the longest follow-up of each individual study, using univariate meta-regression. We did not perform meta-regression where there were fewer than 10 studies included in the analysis. No statistically significant associations were seen in any of the analyses (Table 3, Table 4, Table 5, Table 6, Table 7, Table 8).

DISCUSSION

Summary of main results

Exercise-based CR provides important benefits up to 12 months' follow-up, including a large reduction in fatal or non-fatal MI, and likely reductions in all-cause mortality and all-cause hospital admissions. There was evidence that exercise-based CR results in little to no difference in CABG, and likely results in little to no difference in cardiovascular mortality and PCI. Evidence was uncertain whether exercise-based CR may result in reduced risk of cardiovascular hospital admissions. Imprecision (wide 95% CI), publication bias and statistical heterogeneity led to downgrading the certainty of these outcomes up to 12 months' follow-up.

At medium-term follow-up (> 12 to 36 months), although there may be little to no difference in all-cause mortality, MI, PCI, CABG and all-cause hospitalisation with exercise-based CR, a large reduction in cardiovascular mortality was found. The evidence was uncertain for difference in risk of cardiovascular hospitalisation.

At long-term follow-up (> 3 years), evidence suggests that exercise-based CR may result in little to no difference in all-cause mortality, but may result in a large reduction in risks of cardiovascular mortality and MI. The evidence was uncertain for difference in risk of CABG and PCI.

Univariate meta-regression analysis showed that the impact of exercise-based CR on clinical events appears to be largely consistent across trials, irrespective of case mix (% of post-MI participants), type of rehabilitation (exercise-only versus comprehensive), dose of exercise training (number of weeks of exercise training x average number of sessions/week x average minutes/session), duration of follow-up (months), study location (continent - Europe, North America, Australia/Asia or other, or LMIC versus HIC setting), year of publication (pre-1995 versus post-1995), risk of bias (low risk in ≤ 3 items versus > 3 items) or sample size (≤ 150 vs > 150).

We did not undertake meta-analysis for all HRQoL outcomes, due to the range of outcome measures and methods of reporting. However, where meta-analysis was possible, there was evidence of some small increases in HRQoL with exercise-based CR compared with 'no exercise' control, across several SF-36 subscales (mental component, physical functioning, physical performance, general health, vitality, social functioning and mental health scores). However, these may not be clinically important differences. These findings were supported by a vote-counting approach to summarise HRQoL results across all studies reporting HRQoL, in which 23/32 (72%) trials reported higher levels of HRQoL in one or more subscales with exercise-based CR compared to control at follow-up. Whilst this method of synthesis without meta-analysis has significant limitations, such as not taking account of the differential weights given to each trial, we believe it to be the best available method to concisely and transparently summarise the results (Campbell 2020).

The five trial-based economic evaluation studies showed exercise-based CR to be a potentially cost-effective use of resources in terms of gain in QALYs.

Overall completeness and applicability of evidence

The generalisability of early versions of this review was limited, as most included studies recruited predominantly male participants (Jolliffe 2001: 9% female; current version: 16% female), following MI (Jolliffe 2001: 80% trials with MI only participants; current version: 47% trials with MI only participants). However, with the inclusion of more women in trials conducted in the last decade and with further data on the outcomes of hospitalisation and HRQoL, the findings of this updated review potentially have greater external validity. An additional 16 new studies identified and included in this current update have been undertaken in low- and middle-income countries, increasing the generalisability of our results to these countries where prevalence of CHD is high and continues to increase (Prabhakaran 2018).

Quality of the evidence

In previous versions of this review, the general lack of adequate reporting of randomisation and blinding methods in the included RCT reports made it difficult to assess their methodological quality. However, the quality of reporting in studies has increased over the last decade, and reassuringly, meta-regression showed no significant association between the effect of CR compared to control and the level of risk of bias across trials.

GRADE demonstrated that the certainty of the evidence ranged from low to high across the primary outcomes. We downgraded the certainty of the evidence for all-cause mortality, cardiovascular mortality, PCI and cardiovascular hospitalisations by one level for imprecision, due to wide confidence intervals that overlapped the boundary for no effect (i.e. 95% CI crossed 1). We downgraded the certainty of the evidence for MI and all-cause hospitalisations by one level due to evidence of publication bias (Egger test: $P < 0.05$). We downgraded the certainty of the evidence for cardiovascular hospitalisations by one level due to evidence of substantial heterogeneity (Chi^2 test: $P < 0.05$, or I^2 test for heterogeneity > 50%, or both).

Potential biases in the review process

We believe this is the most comprehensive systematic review to date of RCT-based evidence for the impact of exercise-based CR for people with CHD. However, it is important that we contextualise our review findings in light of some limitations.

Details of random allocation sequence generation and concealment, and blinding of outcome assessment were poorly reported (33% trials adequately reported allocation sequence generation and 29% trials adequately reported blinding of outcome assessment), and therefore may be subject to bias. Funnel plot asymmetry for the risk of MI and all-cause hospital admission is indicative of small-study bias and possible publication bias. There was also evidence of statistical heterogeneity for all-cause and cardiovascular hospitalisations, and all HRQoL subscales, except SF-12 MCS.

The number of trials reporting medium-term (> 12 to 36 month follow-up) and long-term data (> 36 months' follow-up) has decreased from 47% (27/57 trials) to 21% (7/33 trials) over the last decade, while sample sizes have remained relatively small over the same period (median sample size increased from 125 to 142). As a result, the number of deaths and other clinical events, including hospitalisations, reported by many trials is small, or in some cases, zero. Indeed, in many studies, we located event data in the participant flow diagrams and descriptions of losses to follow-up and exclusions, rather than as prespecified outcomes measured, reported, or analysed within trials. In addition, cause of death was often not reported. Furthermore, in recent studies, clinical events have often been reported as a composite endpoint (e.g. major adverse cardiac events) rather than as individual events. These data reporting and evidence syntheses issues may have resulted in some of the apparently paradoxical findings of this review, such as reduced all-cause mortality but not cardiovascular mortality in the short term.

All included studies involved a 'no formal exercise training' intervention comparator. However, a wide range of comparators were seen across the trials, including education, psychological intervention or usual medical care alone. Due to poor and inconsistent reporting of adherence and fidelity to exercise programmes in the RCTs, we were not able to consider the actual amount of exercise that participants received or performed in this review.

Agreements and disagreements with other studies or reviews

The findings of this updated review are largely in accord with the previous version of this review. Although there was a trend towards a slight reduction in all-cause mortality with exercise-based CR compared to 'no exercise' control, this reduction failed to reach statistical significance. This is likely explained by the inclusion of more recent trials conducted in the era of optimal medical therapy. Given the proven survival advantage of contemporary medical treatments, and the limited opportunity for mortality gain in this patient cohort, any incremental mortality benefit with exercise is likely to be small. This theory is supported by Powell and colleagues' meta-analysis of contemporary trials (Powell 2018), demonstrating no improvement in all-cause mortality across 19 trials (risk difference (RD) 0.00, 95% CI -0.02 to 0.01; P = 0.38), or 9 trials reporting cardiovascular mortality (RD -0.01, 95% CI -0.02 to 0.01; P = 0.25), published between 2000 and 2017. Our meta-regression analysis showed a potential trend (RR 0.84, 95% CI 0.70 to 0.99; P = 0.04) suggesting all-cause mortality could be somewhat associated with publication year. However, due to multiple testing, we cannot rule out that this finding was by chance, and did not meet the criteria for statistical significance once the Bonferroni correction was applied.

Our results are also somewhat consistent with the findings of a recently published comprehensive network meta-analysis (Huang 2021). In this study, the authors found that comprehensive exercise-based CR reduces the risk of all-cause mortality, yet unlike our results, risks of PCI and CABG revascularisation were also reduced. Exercise-only CR was found to reduce the risks of non-fatal MI, cardiovascular mortality, and all-cause and cardiovascular hospitalisation, but not the risk of all-cause mortality or revascularisations compared to standard care. The authors also similarly found no strong evidence to differentiate the relative benefits of exercise-based CR, whether delivered as an exercise-only intervention or a comprehensive intervention.

McGregor and colleagues performed a meta-analysis of exercise-based CR based on HRQoL outcomes of people with CHD, including 15 short-term (i.e. 1 to 6 months) and 9 medium-term (i.e. 8 to 12 months) trials (McGregor 2020). Pooled HRQoL results were consistent with the present review, showing improvement with CR across a number HRQoL domain scores.

The recently updated meta-analysis of the Cardiac Rehabilitation Outcome Study (CROSII), which included RCTs and prospective and retrospective cohort studies, reported a mortality benefit of CR in people with acute coronary syndrome and revascularisation, with an index event in 1995 or later (Salzwedel 2020). However, with inclusion of observational evidence, the prognostic benefit reported by the CROSII study is subject to selection bias and confounding.

AUTHORS' CONCLUSIONS

Implications for practice

This review shows that exercise-based cardiac rehabilitation (CR) provides important benefits by likely reducing risks of all-cause mortality, myocardial infarction (MI), all-cause hospitalisation and associated healthcare costs, and improving health-related quality of life (HRQoL) in people with coronary heart disease (CHD). There was an increase in the proportion of female participants in more recent trials. However, the application of this evidence base to more poorly-represented groups, particularly people with angina pectoris and higher-risk CHD, and those with major comorbidities, remains a question of clinical judgement. There appears to be little to choose between exercise-only CR or exercise in combination with psychosocial or educational CR interventions. In the absence of definitive cost-effectiveness conclusions comparing psychosocial or educational approaches to exercise-based CR, it would be rational to use cost considerations to determine practice. Finally, this update included a further 16 randomised controlled trials (RCTs) undertaken in low- and middle-income countries (LMICs), increasing the generalisability of our findings to these settings.

Implications for research

In spite of incorporation of recent trial evidence including more women, the population of people with CHD studied in this review remains predominately low-risk, middle-aged males following MI or revascularisation. Therefore, well-designed, and adequately-reported RCTs of CR in groups of people with CHD more representative of usual clinical practice are still needed. These trials need to explicitly report clinical events, including mortality and hospital admission; should include validated HRQoL outcome measures, especially over longer-term follow-up; and should assess costs and cost-effectiveness. Further details of the presentation and diagnoses of people with CHD, and interventions offered and received, should be reported in trials, so that results of future reviews can better stratify outcomes according to the range of CHD populations or types of CR interventions.

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CHARACTERISTICS OF STUDIES

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

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* Indicates the major publication for the study

Andersen 1981

Study characteristics	
Methods	**Study design:** RCT **Country:** Denmark **Dates participants recruited:** NR **Maximum follow-up:** 37 months Post MI randomised four weeks after discharge.
Participants	**Inclusion criteria**: < 66 yrs with 1st MI

Andersen 1981 *(Continued)*

	Exclusion criteria: participants without motivation and participants with impairment of the motorial apparatus that excluded training **N randomised:** total: 75; intervention: 38; comparator: 37 **Diagnosis (% of participants):** post MI: 100% **Age (mean ±SD):** intervention: 52.2 ± 7.5; comparator: 55.6 ± 6.3 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** aerobic activity e.g. running, cycling, skipping + weights for 1 hour x 2 weekly for 2 months, then x 1 week for 10 months. Then continue at home. **Components:** exercise only **Setting:** centre-based initially, followed by home **Exercise programme modality:** e.g. running, cycling, skipping **Length of session:** 1 hour **Frequency:** twice a week for two months, and then weekly for 10 months **Intensity:** initial load of 150 kpm/min (24.5 W). increased with 150 kpm/min every 6 mins **Resistance training included?** yes - weights **Total duration:** 12 months **Co-interventions:** none described **Comparator:** non-trained group (although some participants trained on own initiative) **Co-interventions:** none described
Outcomes	Total and CHD mortality Non-fatal MI Outcomes measured at 1, 13, 25 and 37 months post-discharge
Source of funding	NR
Conflicts of interest	NR
Notes	88 participants were randomised, but 13 failed to follow up. Therefore, 75 took part in the study. Several participants in control group trained on own initiative, but were analysed as intention-to-treat. Triallists concluded that physical training after MI appears to reduce consequences and to improve PWC, but PWC declines once participant is on their own. Physical training had no effect on period of convalescence or return to work, but age and previous occupation were of significance.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"random numbers"
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not reported

Andersen 1981 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	15% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points

Aronov 2010

Study characteristics	
Methods	**Study design:** multicentre RCT (20 cities) **Country:** Russia **Dates participants recruited:** NR **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: people 3 to 8 weeks after MI, unstable angina or reconstructive coronary arteries intervention. In some cases (at discretion of the researchers), people with stable angina after hospital treatment with unconfirmed diagnosis of MI or unstable angina were included in the study. **Exclusion criteria:** none reported **N Randomised:** total: 392; intervention: 197; comparator: 195 **Diagnosis (% of participants):** Stable angina: intervention: 62.7; comparator: 77.7 Post MI: intervention: 78.4; comparator: 77.3 Unstable angina: intervention: 5.0; comparator: 10.9 (not mutually exclusive) **Age (mean ± SD):** intervention: 51.9 ± 7.2; comparator: 51.9 ± 7 **Percentage male:** intervention: 95.5; comparator: 91.7 **Ethnicity:** NR
Interventions	**Intervention:** participants of the main group received moderate-intensity PT (50% to 60% of the performed capacity by bicycle ergometry (BE) test) 3 times per week with duration of exercises from 45 minutes to 1 hour for 1 year **Components:** exercise only **Setting:** NR **Exercise programme modality:** cycling **Length of session:** 45-60 mins **Frequency:** 3 times a week **Intensity:** 50% to 60% of the performed capacity by bicycle ergometry test **Resistance training included?** No

Aronov 2010 *(Continued)*

	Total duration: 1 year **Co-interventions:** participants received standard medical therapy described below. **Comparator:** participants received standard medical therapy which included beta-blocker, acetylsalicylic acid or other antithrombotic drug, as well as nitrate, and ACE inhibitor. Some participants took lipid-lowering drugs. **Co-interventions:** none described
Outcomes	Mortality and MI
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described….“patients were randomised into 2 groups….”
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of assessments not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	Withdrawals were similar for both groups.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Aronov 2019

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Russia **Dates participants recruited:** NR **Maximum follow-up:** 12 months
Participants	**Inclusion criteria:** male participants with coronary artery disease that underwent CABG 3 to 8 weeks before enrolment **Exclusion criteria:** early post-surgery stenocardia, pericarditis (diagnosed by echocardiography), pericardial effusion with a volume of pericardial fluid exceeding 200 mL, separation of the pericardial layers in diastole more than 1 cm, or moderate pericardial effusion with signs of inflammation), sternal diastasis and other post-surgery complications (impaired wound healing, suture sinuses or pain), car-

Aronov 2019 *(Continued)*

	diac arrhythmia, heart failure, maximal power output in cycle ergometer test < 50 W, hypertension (≥ 180/100 mmHg), history of stroke or transient ischaemia, carotid artery narrowing by ≥ 50%, intermittent claudication syndrome, relapsing thromboembolism complications, severe diabetes mellitus, morbid obesity, pulmonary disorders, concurrent diseases that impede physical training. **N randomised:** total: 36; intervention: 18; comparator: 18 **Diagnosis (% of participants):** intervention: received CABG 17 (94%), history of MI 13 (72.2%), history of angina 13 (72.2%); comparator: received CABG 17 (94%), history of MI 10 (55.6%), history of angina 15 (83.3%). **Age (mean ±SD):** intervention: 58.6 ± 7.0; comparator 55.9 ± 7.0 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** "School for coronary bypass patients" - an integrated cardiac rehabilitation program. Weekly group information sessions (60 to 80 min) under guidance by a cardiologist. Sessions focused on most common topics related to rehabilitation after CABG: cardiac diseases, cardiovascular risk factors, smoking cessation, stress management, anxiety and depression, and "hearthealthy" diet and cooking. Supervised physical training 3 times per week for 4 months. 60-minute sessions including breathing exercise, physical drill complexes and cycling on a stationary bicycle at moderate intensity (50% to 60% max. power assessed by graded cycle ergometer test). After 4 months centre-based CR, participants continued home-based exercise for 6 months. Participants provided with written instructions and a video with recommendations to follow the programme for a year. Participants instructed to perform self-assessment of their physical well being at home. Exercises included breathing, physical drill and walking. **Components:** exercise plus education plus individual counselling sessions upon request **Setting:** centre- and then home-based **Exercise programme modality:** breathing exercises, physical drills, centre-based stationary cycling, and home-based walking **Length of session:** 1 hour **Frequency:** three sessions per week **Intensity:** 50% to 60% maximal power **Resistance training included?** No **Total duration:** 10 months **Co-interventions:** none described **Comparator:** control group participants attended the same educational sessions as intervention group. Participants received a recommendation to follow physical training at home on their own. **Co-interventions:** none described
Outcomes	Total mortality, revascularisations, hospitalisations, HRQoL
Source of funding	NR
Conflicts of interest	None declared
Notes	Authors contacted for further clinical outcomes and QoL data but no response received
Risk of bias	

Bias	Authors' judgement	Support for judgement

Aronov 2019 *(Continued)*

Random sequence generation (selection bias)	Unclear risk	No information provided regarding methods used to generate allocation sequence
Allocation concealment (selection bias)	Unclear risk	No information provided regarding methods used to conceal allocation sequence
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided regarding blinding of outcome assessment for any of the main outcomes of interest
Incomplete outcome data (attrition bias) All outcomes	Low risk	Only 1 participant in control group reported as withdrawn for non-medical reasons
Selective reporting (reporting bias)	Unclear risk	No protocol paper or clinical trials registration available

Bäck 2008

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** 2004 to 2006 **Maximum follow-up:** 8 months (6 months following PCI)
Participants	**Inclusion criteria**: coronary artery stenosis documented by angiography or previous coronary artery bypass grafting, classes I-III angina pectoris, classified according to Canadian Cardiovascular Society. **Exclusion criteria:** disabling disease that hindered regular exercise, or if the individual has already engaged in exercise more than 3 days/week **N randomised:** total: 37; intervention: 21; comparator: 16 **Diagnosis (% of participants):** stable CAD: 100% **Age (years):** 63.6 years; intervention: 61.5 (59.8 to 65.5); comparator: 64 (58.5 to 71.0) **Percentage male:** 86.5%; intervention: 81.0%; comparator: 93.8% **Ethnicity:** NR
Interventions	**Intervention:** participants were asked to exercise at home on a bicycle ergometer for 30 min (including a 10-minute warm-up and a 5-minute cool-down), 5 days a week for 8 months. The training programme was initiated 2 months before the PCI. Twice a week the training participants were allowed to exchange cycling for an equivalent exercise such as jogging or swimming. **Components:** exercise and education **Setting:** home **Exercise programme modality:** bicycle ergometer **Length of session:** 30 min **Frequency:** 5 times a week. **Intensity:** 70% of $V0_2$max. **Resistance training included?** Resistance exercise with elastic bands, 3 times a week

Bäck 2008 *(Continued)*

	Total duration: 8 months **Co-interventions:** participants in both groups were invited to participate in the CR care consisting of group-based lifestyle education and aerobic as well as resistance exercise twice a week during months 4 to 6. **Comparator:** usual care **Co-interventions:** as above
Outcomes	PCI at 2 months before PCI and 6 months after PCI
Source of funding	The Swedish Heart Association, the Research and Development Council for Southern Gothenberg and Bohuslan, and Rene Eanders Foundation
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomised"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	8.1% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points (although absolute values not always given)

Belardinelli 2001

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Italy **Dates participants recruited:** NR **Maximum follow-up:** 33 (SD 7) months
Participants	**Inclusion criteria**: successful procedure of coronary angioplasty in 1 or 2 native epicardial coronary arteries and ability to exercise **Exclusion criteria:** previous coronary artery procedures, cardiogenic shock, unsuccessful angioplasty (defined as residual stenosis > 30% of initial value), complex ventricular arrhythmias, uncontrolled hy-

Belardinelli 2001 *(Continued)*

	pertension and diabetes mellitus, creatinine > 2.5 mg/dL, orthopedic or neurological limitations to exercise or unstable angina after procedure and before enrolment **N randomised:** total:118; intervention: 59; comparator: 59 **Diagnosis (% of participants):** Myocardial infarction: intervention: 51; comparator: 47 Hypercholesterolemia: intervention: 61; comparator: 54 Diabetes: intervention: 17; comparator: 20 Hypertension: intervention: 42; comparator: 47 LVEF (%): intervention: 52 (SD 16); comparator: 50 (SD 14) **Age (mean ± SD):** intervention: 53 ± 11; comparator: 59 ± 10 **Percentage male:** intervention: 83.1%; comparator: 84.8% **Percentage white:** NR
Interventions	**Intervention:** exercise sessions were performed at the hospital gym and were supervised by a cardiologist. After a 15-min phase of stretching and callisthenics, participants pedaled on an electronically-braked cycle ergometer at the target work rate for 30 min. This working phase was preceded by a 5-min loadless warm-up and followed by 3 min of unloaded cool-down pedaling. **Components:** exercise only **Setting:** supervised in hospital gym **Exercise programme modality:** electronically-braked cycle ergometer **Length of session:** 53 min. **Frequency:** 3 sessions/week **Intensity:** 60% of peak oxygen uptake (VO_2) **Resistance training included?** Yes - callisthenics **Total duration:** six months **Co-interventions:** none described **Comparator:** control participants were recommended to perform basic daily mild physical activities but to avoid any physical training. A list of acceptable physical activities was provided, together with a diary to report daily activities. **Co-interventions:** none described
Outcomes	Cardiac mortality; myocardial infarction; coronary angioplasty (percutaneous transluminal coronary angioplasty, coronary stent); coronary artery bypass graft; health-related quality of life: MOS Short-Form General Health Survey
Source of funding	NR
Conflicts of interest	NR
Notes	
Risk of bias	

Bias	Authors' judgement	Support for judgement

Belardinelli 2001 *(Continued)*

Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	Cardiac events of 12 participants who were excluded not accounted for
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Bell 1998

Study characteristics	
Methods	**Study design:** multicentre RCT (5 sites), participants randomised 4 to 6 days post-event. Two independent 2-way evaluations: conventional CR versus the Heart Manual (HM) and HM versus usual care **Country:** UK **Dates participants recruited:** NR **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: post MI < 65 years **Exclusion criteria**: physical infirmity which precludes exercise, inability to speak or read English, dementia or psychosis, age over 75 years, residency more than 20 miles from the coronary care unit (CCU), serious persisting complications which had not been stabilised at time of proposed randomisation including: continuing post-infarct ischaemia, clinically significant heart failure, important cardiac arrhythmias, conduction disturbances (LBBB > mobitz type 1, 2nd degree AV block), concurrent illnesses (e.g. severe respiratory disease, renal insufficiency, etc.), any other condition which, in the consultant's opinion, would interfere with the individual's successful participation in the programme, or previous participation in the rehabilitation programme **N randomised:** total: 353; intervention: 251; comparator: 102 **Diagnosis (% of participants):** MI: 100% **Age (mean ±SD):** for women: 60.7 ± 7.2 to 64.3 ± 7.3; for men: 57.8 ± 8.9 to 59.4 ± 9.4 **Percentage male:** 78% **Ethnicity:** NR
Interventions	**Intervention:** **Heart Manual group:** the Heart Manual is a comprehensive home-based programme which includes an exercise regimen, relaxation and stress management techniques, specific self-help treatments for psychological problems commonly experienced by MI patients and advice on coronary risk-related behaviours.

Bell 1998 *(Continued)*

	Components: exercise, education and psychological **Setting:** home **Exercise programme modality:** walking **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** up to 6 weeks **Co-interventions:** relaxation and stress management techniques, specific self-help treatments for psychological problems commonly experienced by MI patients and advice on coronary risk-related behaviours **Conventional CR group:** 1 to 2 group classes per week, walking etc., other days for 8 to 12 weeks with multidisciplinary team **Comparator:** usual care **Co-interventions:** none described
Outcomes	Total mortality, health-related quality of life: Nottingham Health Profile
Source of funding	British Heart Foundation
Conflicts of interest	NR
Notes	Hospital readmissions significantly reduced in Heart Manual group compared with conventional CR and control in initial six-month period

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomisation was achieved by providing each hospital with a series of sealed envelopes containing cards evenly distributed between conditions. The envelopes were taken sequentially and, before opening the envelope, the patient's surname was written diagonally across the sealed flap, in such a way that when the envelope was opened the name was 'torn in two'. Opened envelopes were retained and returned to the trial coordinator. The importance of remaining neutral when advising the patients of the outcome of randomisation was emphasised in the written protocol and was reinforced during the sessions which were held to familiarise facilitators with the protocol."
Allocation concealment (selection bias)	Low risk	"Randomisation was achieved by providing each hospital with a series of sealed envelopes containing cards evenly distributed between conditions. The envelopes were taken sequentially and, before opening the envelope, the patient's surname was written diagonally across the sealed flap, in such a way that when the envelope was opened the name was 'torn in two'. Opened envelopes were retained and returned to the trial coordinator. The importance of remaining neutral when advising the patients of the outcome of randomisation was emphasised in the written protocol and was reinforced during the sessions which were held to familiarise facilitators with the protocol." Comment: participants were informed of outcome of randomisation.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described

Bell 1998 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Low risk	1.5% lost to follow-up and reported description of withdrawals and/or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Bengtsson 1983

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** October 1973 to January 1975 **Maximum follow-up:** 14 months
Participants	**Inclusion criteria**: participants > 65 years with MI **Exclusion criteria:** severe cardiac failure, post myocardial infarction (PMI)-syndrome, aortic regurgitation, cerebral infarct hemiparesis, disease of hip, status post-poliomyelitis, amputation of lower extremity, diabetes with retinopathy, hyper/hypo thyroidism, hyperparathyroidism, mental illness **N randomised:** total: 87; intervention: 44; comparator: 43 **Diagnosis (% of participants):** AMI: 100% **Age (years ± SD):** intervention: 55.3 ± 6.6; comparator: 57.1 ± 6.6 **Percentage male:** 85% **Ethnicity:** NR
Interventions	**Intervention:** physical training under the supervision of a specially-trained physiotherapist attached to the cardiological unit. Exercises consisted of interval training of large muscle groups on a mechanically-braked ergometer bicycle, callisthenics and jogging for 30 minutes twice weekly over a period of 3 months. The intensity of the exercises was graded individually on the basis of the findings at the exercise tolerance test, and a maximum heart rate at exercise was prescribed. **Components:** exercise, counselling and social measures **Setting:** supervised at the cardiological unit **Exercise programme modality:** ergometer cycling **Length of session:** 30 min. **Frequency:** twice per week **Intensity:** 90% of the max heart rate at the exercise tolerance test **Resistance training included?** Interval training of large muscle groups, callisthenics **Total duration:** 3 months **Co-interventions:** Counselling was given, supplying practical information on avoiding weight gain, to stop smoking, to keep on with the physical exercise and to resume leisure activities as much as possible. **Comparator:** conventional care **Co-interventions:** none described

Bengtsson 1983 *(Continued)*

Outcomes	Total mortality, CHD mortality, non-fatal MI up to average 14 months
Source of funding	NR
Conflicts of interest	NR
Notes	Most emphasis on social/ psychological aspects. 171 participants were randomised and at discharge, the cardiologist decided whether the participant was fit to take part in the rehabilitation programme - 45 participants were excluded at this point. Seven people in the intervention group declined to take part, but six of these were seen at follow-up and included in the analysis because "control group probably had a comparable number who would have declined further treatment."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"allocated at random"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	Description of withdrawals and dropouts: intervention group 29%; control group 33% lost to follow-up from 126 who took part. 171 were randomised and then 45 excluded by cardiologist.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Bertie 1992

Study characteristics

Methods	**Study design:** single-centre RCT; participants were randomised on day of discharge after MI **Country:** UK **Dates participants recruited:** NR **Maximum follow-up:** 24 months
Participants	**Inclusion criteria**: men and women with AMI **Exclusion criteria:** uncontrolled heart failure; serious rhythm disturbances which persisted and required treatment at time of discharge; another disabling disease **N randomised:** total: 110; intervention: 57; comparator: 53 **Diagnosis (% of participants):** AMI: 100% **Age (mean ± SD):** intervention: 52.1 ± 1.3; comparator: 52.7 ± 1.3

Bertie 1992 *(Continued)*

	Percentage male: NR **Ethnicity:** NR
Interventions	**Exercise:** a formal rehabilitation programme at the hospital started 3 weeks post-discharge. The programme concentrated mainly on standard pulse-monitored group exercise, supervised by a physiotherapist. Participants completed a circuit of 12 exercises, and after a five-minute interval, they repeated the circuit, up to a maximum of four circuits. **Components:** exercise **Setting:** supervised group sessions in the hospital gymnasium **Exercise programme modality:** "group exercises" **Length of session:** NR **Frequency:** twice per week **Intensity:** NR **Total duration:** 4 weeks **Co-interventions:** health, smoking and dietary advice and a relaxation technique **Comparator:** standard hospital care **Co-interventions:** all participants were asked to stop smoking and given dietary advice either for weight reduction or because of elevated serum cholesterol. To boost confidence, each participant was asked to walk up two flights of stairs under supervision and was given advice on mobilisation on discharge.
Outcomes	Total mortality, non-fatal MI, revascularisation; assessments at day of discharge, 3rd week after discharge; after rehabilitation (for intervention group); four months after infarct and 12 to 24 months after infarct)
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomised"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	24% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Bethell 1990

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** UK **Dates participants recruited:** 1 December 1979 to March 1984 **Maximum follow-up:** 5 years
Participants	**Inclusion criteria**: < 65 years post MI; history of chest pain typical of MI, progressive ECG changes, rise and fall in aspartate transaminase concentrations with at least one reading above 40 units/mL **Exclusion criteria:** medical or orthopaedic problems that precluded their taking part in the exercise course; insulin-dependent diabetes mellitus; atrial fibrillation; on investigator's personal general practice list **N randomised:** total: 200; intervention: 99; comparator: 101 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 54.2 ± 7.2; comparator: 54.2 ± 7.2 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** treatment participants entered a three-month course of three times a week circuit training. **Components:** exercise only **Setting:** centre **Exercise programme modality:** 8 stage circuit aerobic training **Length of session:** NR **Frequency:** 3 times a week **Intensity:** 70% to 85% predicted HR max. **Resistance training included?** Yes - weight training **Total duration:** 3 months **Co-interventions:** NR **Comparator:** participants were given a short talk on the sort of exercise that they might safely take unsupervised **Co-interventions:** NR
Outcomes	Total mortality, CHD mortality, non-fatal MI (11 year follow-up published in 1999. Five-year follow-up data from unpublished material used for meta analysis.)
Source of funding	British Heart Foundation and Wessex Regional Health Authority
Conflicts of interest	NR
Notes	229 participants were randomised; 14 in the intervention group and 15 in control dropped out before the first exercise test due to death, refusal or other problems. Therefore 200 took part in the study.

Bethell 1990 *(Continued)*

	Cardiac mortality of 3% per annum, once participants survived to be in the trial. Suggests more severely affected participants were not included. Significant predictors of cardiac death were pulmonary oedema on admission, complications during admission, one or more previous infarcts, increasing age and low initial fitness.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random letter sequence
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	16% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Bettencourt 2005a

Study characteristics

Methods	**Study design:** single-centre RCT (1:3 randomisation) **Country:** Portugal **Dates participants recruited:** 1 September 2001 to 31 December 2002 **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: participants without previous cardiological follow-up, with > 4 years' education, following hospitalisation for acute coronary syndrome (ACS) **Exclusion criteria:** none stated **N randomised:** total: 126; intervention: 31; comparator: 95 **Diagnosis (% of participants):** Unstable angina: intervention 20; comparator: 27 Non-Q wave MI: intervention 33; comparator: 31 Anterior MI: intervention 23; comparator: 20 Inferior MI: intervention 24; comparator: 21 MI of undetermined location: intervention 10; comparator 11 **Age (years):** intervention: 56 (range: 31-80); comparator: 58 (range: 33-86) **Percentage male:** intervention**:** 84 %; comparator 83%

Bettencourt 2005a *(Continued)*

	Ethnicity: NR
Interventions	**Intervention:** the sessions took place in the hospital's gymnasium under qualified supervision. They consisted of a warm-up period at the beginning of each session, 20 to 30 minutes on a treadmill or ergometric bicycle and a recovery period with low intensity activities. The exercise programme was initially based on the maximum heart rate reached on the exercise test prior to beginning the programme (performed on average five weeks after the ACS). **Components:** exercise only **Setting:** aerobic exercise in supervised group sessions **Exercise programme modality:** treadmill and bicycle **Length of session:** 60 minutes **Frequency:** 3 times/week **Intensity:** NR **Resistance training included?** No **Total duration:** 12 weeks, followed by one session a month for the remainder of the year **Co-interventions:** none described **Comparator:** standard follow-up consisting of a mean of 3.5 consultations per year following the first event **Co-interventions:** none described
Outcomes	HRQoL
Source of funding	The Commission to Foster Health Care Research
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"...the patients were randomly allocated to our hospital's cardiac rehabilitation program or standard cardiological follow-up."
Allocation concealment (selection bias)	High risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	High risk	"nature of the intervention being assessed did not permit blinding"
Incomplete outcome data (attrition bias) All outcomes	Low risk	There was no loss to follow-up.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods were reported in the results section for both time points.

Briffa 2005

Study characteristics	
Methods	**Study design:** multicentre open RCT (2 sites) **Country:** Australia **Dates participants recruited:** 2-year period. No dates given. **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: uncomplicated acute myocardial infarction (AMI) or recovery from unstable angina aged under 75 years, self-caring, adequately literate in the English language, residing in the geographical area of the health service **Exclusion criteria:** presentation with uncompensated heart failure, uncontrolled arrhythmias, severe and symptomatic aortic stenosis, or other conditions precluding physical activity **N randomised:** total: 113; intervention: 57; comparator: 56 **Diagnosis (% of participants):** AMI: intervention 36.8; comparator 48.2 Unstable angina: intervention 63.2; comparator 51.8 Thrombolytic therapy: intervention 14.0; comparator 25.0 PCI/CAGS: intervention 59.6; comparator 46.4 Prior AMI, PCI, CAGS: intervention 36.8; comparator 50.0 **Age (Mean ± SD):** intervention: 60.8 ± 8.7; comparator: 61.9 ± 9.4 **Percentage male:** intervention 72%; comparator 75% **Ethnicity:** NR
Interventions	**Intervention:** comprehensive exercise-based outpatient cardiac rehabilitation **Components:** exercise plus education plus psychosocial counselling **Setting:** hospital-based, supervised exercise **Exercise programme modality:** aerobic circuit training interspaced with resistance training **Length of session:** 60 to 90 minutes **Frequency:** 3 times per week **Intensity:** NR **Resistance training included?** Yes **Total duration:** 6 weeks **Co-interventions:** 45 minutes of education (12 occasions) and 45 minutes of psychosocial counselling (6 occasions). If necessary, additional one-on-one counselling was provided. **Comparator:** conventional care: participants from both groups received individualised medical treatment including non-invasive and invasive cardiological procedures, surgical revascularisation, pharmacotherapy, and lifestyle counselling, as determined by their usual doctors. **Co-interventions:** none described ("Access to community cardiac rehabilitation programs was limited for the conventional management group")
Outcomes	Costs, HRQoL

Briffa 2005 *(Continued)*

Source of funding	University of Sydney, the Cardiac Society of Australia and New Zealand, and the National Heart Foundation of Australia; NHMRC; Department of Cardiology, Royal Prince Alfred Hospital
Conflicts of interest	"None identified"
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"...randomisation using dynamic balancing was performed"
Allocation concealment (selection bias)	Low risk	“Central randomisation of participants was performed at the National Health and Medical Research Council Clinical Trials Centre”
Blinding of outcome assessment (detection bias) All outcomes	High risk	“Open” trial so we assume that outcomes were not blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	One person was lost to follow-up and 5 participants changed groups; 2 participants were excluded from each group i.e. 4/113 (4%)
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section are reported in results.

Bubnova 2019

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Russia **Dates participants recruited:** NR **Maximum follow-up:** 12 months.
Participants	**Inclusion criteria:** male and female participants of working age (male < 60 years, female < 55 years) with acute MI (3 to 8 weeks prior), signed informed consent to participate, absence of generally accepted contraindications to performing exercise training **Exclusion criteria:** left ventricular aneurysm with thrombosis, stroke, serious disturbances in the rhythm and conduction of the heart, uncontrolled arterial hypertension with blood pressure ≥ 180/100 mmHg, NYHA class III-IV heart failure, thromboemboli, aortic aneurysm, history of syncope, thrombophlebitis, phlebothrombosis, musculoskeletal disorders, moderate to severe diabetes, severe concomitant diseases, chronic respiratory, hepatic or renal failure **N randomised:** total: 300; intervention: 155; comparator: 145. Groups then split into 3 subgroups according to rehabilitation potential (intervention: low n = 32, average n = 55, high n = 68; control: low n = 22, average n = 64, high n = 59) **Diagnosis (% of participants):** 100% acute MI (68% STEMI) **Age (mean ±SD):** intervention: 49.9 ± 7.2; comparator 50.9 ± 6.1

Bubnova 2019 *(Continued)*

	Percentage male: intervention: 93.5%, comparator: 92.4% **Ethnicity:** NR
Interventions	**Intervention:** physical rehabilitation classes consisting of gymnastics exercises carried out for 60 minutes in groups under supervision of a cardiologist 3 times per week for 1 year. **Components:** exercise only **Setting:** centre-based **Exercise programme modality:** gymnastic exercises **Length of session:** 1 hour **Frequency:** three sessions per week **Intensity:** not reported **Resistance training included?** No **Total duration:** 1 year **Co-interventions:** none described **Comparator:** no exercise training **Co-interventions:** none described
Outcomes	HRQoL, mortality, MI
Source of funding	Not reported
Conflicts of interest	None declared
Notes	Paper translated from Russian

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients were randomized using the envelope method"; no further detail reported
Allocation concealment (selection bias)	Unclear risk	"Patients were randomized using the envelope method"; no further detail reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No detail regarding outcome assessment blinding was reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No PRISMA flow diagram provided, no N in tables and text unclear about attrition, appears that there was no loss to follow-up
Selective reporting (reporting bias)	Unclear risk	No published protocol, outcomes described in methods appear to be reported in the results. Cardiovascular complications unclear

Bubnova 2020

Study characteristics

Bubnova 2020 *(Continued)*

Methods	**Study design:** single-centre RCT (4 arms) **Country:** Russia **Dates participants recruited:** NR **Maximum follow-up:** 12 months
Participants	**Inclusion criteria:** patients after AMI (> 3 weeks) and percutaneous coronary interventions (PCI) at the age of < 60 years for men and < 55 years for women **Exclusion criteria:** inadequately controlled hypertension, aortic or left ventricular (LV) aneurysm with thrombosis, serious arrhythmias, NYHA class III-IV HF, BMI ≥ 40 kg/m^2, moderate/severe diabetes and other severe comorbidities **N randomised:** total: 312; intervention 1 (BMI < 30 kg/m^2) = 78; intervention 2 (BMI ≥ 30 kg/m^2) = 78; comparator 1 (BMI < 30 kg/m^2) = 78; comparator 2 (BMI ≥ 30 kg/m^2) = 78 **Diagnosis (% of participants):** 100% post MI with PCI **Age (mean ±SD):** intervention 1 (BMI < 30 kg/m^2) = 51.9±7.9; intervention 2 (BMI ≥ 30 kg/m^2) = 51.7±6.8; comparator 1 (BMI < 30 kg/m^2) = 52.2±7.2; comparator 2 (BMI ≥ 30 kg/m^2) = 52.6±6.7 **Percentage male:** intervention 1 (BMI < 30 kg/m^2) = 93.6%; intervention 2 (BMI ≥ 30 kg/m^2) = 96.2%; comparator 1 (BMI < 30 kg/m^2) = 94.9%; comparator 2 (BMI ≥ 30 kg/m^2) = 93.6% **Ethnicity:** NR
Interventions	**Intervention:** physical rehabilitation programme included group exercise classes lasting 60 minutes 3 times/week involving a set of gymnastic exercises of moderate intensity **Components:** exercise only **Setting:** centre-based **Exercise programme modality:** gymnastic exercises **Length of session:** 1 hour **Frequency:** three sessions per week **Intensity:** 60% of the threshold value according to cycle ergometer test **Resistance training included?** No **Total duration:** 1 year **Co-interventions:** none described **Comparator:** control participants did not use exercise training programme **Co-interventions:** none described
Outcomes	Mortality, MI, HRQoL
Source of funding	Not reported
Conflicts of interest	None declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement

Bubnova 2020 *(Continued)*

Random sequence generation (selection bias)	Low risk	“Patients were randomised into four groups depending on BMI”. Authors provided further information: "randomly assigned to the physical training or to the control group using a computer programme".
Allocation concealment (selection bias)	Low risk	Authors provided further information: "The allocation sequence was concealed from enrolling researcher".
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided regarding blinding
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No PRISMA flow diagram or description of attrition
Selective reporting (reporting bias)	Unclear risk	No published protocol available, but outcomes described in methods appear to be reported.

Byrkjeland 2015

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Norway **Dates participants recruited:** August 2010 to March 2012 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria:** type 2 diabetes and verified CAD by angiography **Exclusion criteria:** presence of proliferative retinopathy, end-stage renal disease, cancer, stroke or acute MI within the last 3 months, unstable angina, uncompensated heart failure, serious arrhythmia, severe valvular disease, severe rheumatologic disease, chronic obstructive pulmonary disease (COPD) stadium Global Initiative for Chronic Obstructive Lung Disease (GOLD) IV, thromboembolic disease, ongoing infections, severe musculoskeletal disorders and other disabilities limiting the ability for physical activity **N randomised:** total: 137; intervention: 69; comparator: 68 **Diagnosis (% of participants):** stable angina 51 (37%); previous MI 62 (45%). **Age (mean ±SD):** intervention: 64.6 ± 7.9; comparator: 63.2 ± 7.2 **Percentage male:** intervention: 45 (87%); comparator: 50 (81%) **Ethnicity:** NR
Interventions	**Intervention:** 12-month combined aerobic and resistance training programme **Components:** exercise only **Setting:** both centre- and home-based **Exercise programme modality:** circuits containing aerobic and resistance exercises, interval uphill walking/running training, interval step training, spinning on a bike **Length of session:** 1 hour **Frequency:** three sessions per week (2 supervised centre-based, 1 home-based)

Byrkjeland 2015 *(Continued)*

	Intensity: rating of perceived exertion (RPE) 12 to 14 or ≥ 15 for high-intensity interval training **Resistance training included?** Yes, as part of circuit training and separate resistance training included **Total duration:** 12 months **Co-interventions:** none described **Comparator:** continuation of normal follow-up with general practitioner **Co-interventions:** none described
Outcomes	Serious cardiovascular events (composite outcome - worsening of stable angina pectoris and chronic heart failure, unstable angina pectoris, AMI, stroke, sudden cardiac arrest)
Source of funding	"no specific grant from any funding agency in the public, commercial or not-for-profit sectors"
Conflicts of interest	None declared
Notes	Authors contacted to request clinical outcome data, but no response received

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomisation was performed by use of consecutively numbered...in a 1:1 ratio according to tables of random numbers, arranged by the Unit of Epidemiology and Biostatistics."
Allocation concealment (selection bias)	Low risk	"Consecutively numbered, non-translucent envelopes"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	“The ventilatory threshold (VT) was calculated by the ventilatory equivalent method and was determined by two blinded, independent investigators.” Presume other outcomes were not blinded
Incomplete outcome data (attrition bias) All outcomes	High risk	17/69 (24%) participants in the intervention group lost to follow-up or excluded from analysis due to < 40% adherence to exercise intervention (9/69, 13%)
Selective reporting (reporting bias)	Unclear risk	Published protocol paper not available, clinical trials.gov registration gives very vague information about proposed outcomes

Campo 2020

Study characteristics

Methods	**Study design:** multicentre RCT (3 sites) **Country:** Italy **Dates participants recruited:** January 2017 to April 2018 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: age ≥ 70 years, hospital admission for ACS, short physical performance battery (SPPB) score from 4 to 9 at the inclusion visit (30 ± 5 days after discharge)

Campo 2020 *(Continued)*

	Exclusion criteria: participants with SPPB score ≥ 10 or ≤ 3. Multivessel disease with indication for surgical revascularisation or staged PCI, inability to be discharged to home, congestive HF, LVEF < 30%, severe valvular disease **N randomised:** total: 235; intervention: 118; comparator: 117 **Diagnosis (% of participants):** intervention: STEMI 33 (28%), NSTEMI 75 (65%), unstable angina 10 (7%); comparator: STEMI 31 (26%), NSTEMI 77 (66%), unstable angina 9 (8%) **Age (median, range):** intervention: 76, 72 to 80; comparator: 77, 73 to 80 **Percentage male:** intervention: 92 (78%); comparator: 89 (76%) **Ethnicity (White, %):** NR
Interventions	**Intervention:** 4 supervised sessions (1, 2, 3, 4 months after discharge) combined with an individualised home-based exercise programme. Centre-based sessions supervised by sports physician and nurse, and included moderate treadmill walk, strength and balance exercises (30 to 40 min). Participants received a walking programme to perform at home along with a selection of callisthenic exercises based on the Otago Exercise Programme. Participants encouraged to perform exercises 2 times per week for approx 20 mins. After the 4 month supervised session, a long-term home-based exercise programme was designed by the sports physician. **Components:** exercise only **Setting:** 4 centre-based sessions, home-based afterwards **Exercise programme modality:** walking, callisthenics, strength and balance **Length of session:** 30 to 60 minutes **Frequency:** at least 3 to 4 times per week **Intensity:** RPE 11 to 13 **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** health education **Comparator:** standard of care **Co-interventions:** health education – 15 minute visit with study doctor, who explained the importance of aerobic physical activity (30 to 60 min/day, moderate intensity, e.g. brisk walking for at least 3 days/week). A detailed brochure explaining the benefits of physical exercise provided to all participants.
Outcomes	Total and cardiovascular mortality, ACS, hospitalisations, HRQoL
Source of funding	"Investigator-driven clinical trial conducted by the University of Ferrara"
Conflicts of interest	None declared
Notes	None

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	“Randomization is performed….via a dedicated website and stratified according the following three variables: sex, clinical presentation (ST-segment elevation ACS vs. non ST-segment elevation ACS) and SPPB score at the inclusion (4–6 vs. 7–9). A dedicated website assigns a unique treatment code"
Allocation concealment (selection bias)	Low risk	“Randomization is performed….via a dedicated website and stratified according the following three variables: sex, clinical presentation (ST-segment eleva-

Campo 2020 *(Continued)*

		tion ACS vs. non ST-segment elevation ACS) and SPPB score at the inclusion (4–6 vs. 7–9). A dedicated website assigns a unique treatment code"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The assessment staff was blinded to the intervention. Participants were asked not to disclose their assigned group and not to talk about their interventions during the assessment. All events were centrally adjudicated by the clinical events committee whose members were unaware of patient randomisation assignment."
Incomplete outcome data (attrition bias) All outcomes	Low risk	Low numbers of participants missing from 1 year follow-up (6 and 7 from each group, < 20%), numbers balanced and reasons provided.
Selective reporting (reporting bias)	Low risk	Published protocol paper available, all outcomes listed in protocol paper are reported at 1 year.

Carlsson 1998

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** NR **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: AMI; CABG < 2 weeks prior; PCI < 2 weeks prior **Exclusion criteria:** signs of unstable angina; signs of ST-depression at exercise test of more than 3 mm in 2 chest leads or more than 2 mm in two limb leads at four weeks post-discharge from hospital, signs of CHF, severe, non-cardiac disease; drinking problems, not a Swedish speaker **N randomised:** total: 235; intervention: 118; comparator: 117 **Diagnosis (% of participants):** CABG: 25%; AMI: 75% **Age (mean ±SD):** AMI patients: intervention: 62.2 ± 5.8; comparator: 61.7 ± 6 CABG patients: intervention: 62.7 ± 4.8; comparator: 59.8 ± 4.8 **Percentage male:** NR **Ethnicity:** NR
Interventions	**Intervention:** continuous physical exercise programme 2 to 3 times weekly for 2 to 3 months. The exercise sessions lasted one hour and were comprised of the following parts: 10 minutes of warm-up; 40 minutes of interval walking or jogging; 10 minute cool-down period (consisting of relaxation and light stretching exercises). Individual exercise schedules were provided in order to maintain the effects of the exercise programme beyond the discharge from the hospital training centre. **Components:** exercise plus education **Setting:** centre and then home **Exercise programme modality:** walking or jogging **Length of session:** 60 minutes

Carlsson 1998 *(Continued)*

	Frequency: 2 to 3 times/week **Intensity:** NR **Resistance training included?** No **Total duration:** 2 to 3 months **Co-interventions:** 9 hours of nurse counselling in individual and group sessions over 1 year; smoking cessation 1.5 hours, dietary management 5.5 hours **Comparator:** usual care, which included two or three visits to their general practitioners during the first year **Co-interventions:** all participants were informed about CAD risk factors and the effect of lifestyle changes on the prognosis.
Outcomes	Mortality
Source of funding	NR
Conflicts of interest	NR
Notes	Groups of 20 participants randomly allocated to intervention and control groups (usual care). Randomised 4 weeks post discharge. In first 3 weeks post discharge, all participants had 2 visits by nurse & 1 by cardiologist, plus all participants invited to join regular exercise group x 1 per week for 30 mins information and 30 mins easy interval training.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	< 20% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Carson 1982

Study characteristics

Methods	**Study design:** single-centre RCT; participants randomised 6 weeks post-admission **Country:** UK **Dates participants recruited:** NR (recruited over a 3.5 year period)

Carson 1982 *(Continued)*

	Maximum follow-up: 3 years
Participants	**Inclusion criteria**: MI; diagnosis based on ECG changes and/or elevation of serum glutamic oxaloacetic transaminase or lactic dehydrogenase taken on three consecutive days. **Exclusion criteria:** > 70 years; heart failure at follow-up clinic; cardio-thoracic ratio exceeding 59%; severe chronic obstructive lung disease; hypertension requiring treatment; diabetes requiring insulin; disabling angina during convalescence; orthopaedic or medical disorders likely to impede progress in the gym, personality disorders likely to render participant unsuitable for the course. **N randomised:** total: 303; intervention: 151; comparator: 152 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SE):** intervention: 50.3 ± 0.65; comparator: 52.8 ± 0.67 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** participants attended the hospital gym twice weekly for 12 weeks. They were supervised by a doctor and physical educationalist and full resuscitative equipment was available. The exercises were arranged on a circuit basis and pure isometric exercise was avoided. **Components:** exercise only **Setting:** centre **Exercise programme modality:** exercises arranged on a circuit basis **Length of session:** NR **Frequency:** twice per week **Intensity:** NR **Resistance training included?** No **Total duration:** 12 weeks **Co-interventions:** none described **Comparator:** did not attend gym **Co-interventions:** none described
Outcomes	Total mortality, non-fatal MI at 5 months, 1 year, 2 years and 3 years after MI (mean follow-up 2.1 years)
Source of funding	Department for Health and Social Security Grant
Conflicts of interest	NR
Notes	There appears to be a reduction in mortality in exercise participants with inferior MI.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly allocated"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias)	Unclear risk	Blinding not described

Carson 1982 *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	High risk	21% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points described in the methods.

Chaves 2019

Study characteristics	
Methods	**Study design:** superiority RCT with waiting-list control (single centre) **Country:** Brazil **Dates participants recruited:** March 2015 to April 2017 **Maximum follow-up:** 12 months - 6 months waiting-list control
Participants	**Inclusion criteria**: participants aged > 18 years and living in the Belo Horizonte area, with coronary artery disease: post myocardial infarction undergone percutaneous coronary intervention or coronary artery bypass graft surgery and had been referred to CR **Exclusion criteria:** cardiac conditions associated with some risk during high-intensity exercise (e.g. heart failure with EF < 45%, complex ventricular dysrhythmia), any comorbid physical condition (e.g. leg amputation, advanced cancer, disabling stroke, Parkinson's disease), or serious mental illness that would interfere with the ability to exercise, according to CR clinical practice guidelines, or any visual or cognitive condition that would preclude the participant from completing the questionnaires **N randomised:** total: 115; intervention 1 (exercise only): 39; intervention 2 (comprehensive CR): 37; comparator: 39 **Diagnosis (% of participants):** participants with CAD after MI or those undergoing PCI/CABG. MI 107 (93%), angina 69 (60%), PCI 68 (59.1%), CABG 29 (25.5%). **Age (mean):** intervention 1: 59 ± 9.9; intervention 2: 60.7 ± 8.8; comparator: no CR (n = 16) 55.9± 6.7, exercise only (n = 12) 60.7 ± 13.3, comprehensive CR (n = 11) 60.6 ± 8.4 **Percentage male:** intervention 1: 28 (71.8%); intervention 2: 27 (73%); comparator: no CR (n = 16) 11 (68.8%), exercise only (n = 12) 12 (100%), comprehensive CR (n = 11) 4 (36.4%) **Ethnicity (white, %):** NR
Interventions	**Intervention:** CR program led by a physician and staffed by physiotherapists. Exercise programme 6 months, consisting of 36 1-hour supervised sessions descending in frequency. Participants provided individualised exercise prescription based on exercise test. Participants requested to exercise in their communities on non-centre-based exercise days to accumulated ≥ 30 minutes of MVPA on ≥ 5 days per week. Comprehensive CR participants were offered an additional 24, weekly 30-minute education sessions, delivered in groups by a health educator, and received a validated education workbook to accompany the sessions. **Components:** exercise only (group 1); exercise plus education (group 2) **Setting:** centre-based (with request to complete home-based exercise in addition) **Exercise programme modality:** treadmill/bike/walking

Chaves 2019 *(Continued)*

Length of session: 1 hour
Frequency: 3 times per week for 4 weeks, 2 times per week for 4 weeks, once per week for 16 weeks.
Intensity: 50% to 80% heart rate reserve
Resistance training included? NR

Total duration: 6 months

Co-interventions: education sessions provided for comprehensive CR group (group 2). Educational curriculum included: information about the CR program, their aerobic exercise prescription and safety, managing angina, irregular heartbeats, diabetes, exercising in cold and hot weather, the heart (anatomy, pathophysiology, diagnoses, and treatment) and cardiac medications risk factor profile, goal setting and action planning, resistance training, nutrition (fats, fibre, reading food labels, sodium), psychosocial risk, and sexual intimacy, how much physical activity is good, aerobic and resistance training progression, relapse planning, and graduation.

Comparator: waiting-list control – all participants received follow-up appointments with their physician as deemed medically important. Participants in the control arm received CR after 6-month mortality ascertained. Participants elected whether they wanted to have exercise only or comprehensive CR, or no CR.

Co-interventions: none

Outcomes	Cardiovascular mortality, MI, revascularisations, hospitalisations
Source of funding	Professor Britto was supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq no. 305786/2014-8), Fundacao de Amparo a Pesquisa do Estado de Minas Gerais (FAPEMIG no. PPM-00869-15 and CS00290-16) and Coordination for the Improvement of Higher Education Personnel (CAPES)
Conflicts of interest	None declared
Notes	Outcomes at 6 months only used for this review, as waiting-list control participants elected which arm of the study to go into after this point.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The randomisation sequence was generated by a professor not involved in the study using the randomization.com website in random blocks of four, with a 1:1:1 allocation ratio."
Allocation concealment (selection bias)	Low risk	"To ensure allocation concealment, the principal investigator (RB) had the allocation sequence in a password-protected file, and only provided randomisation information to the PhD student once it was confirmed the participant was eligible."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"A master's student blinded to random allocation was responsible for post-test assessments, outcome ascertainment and data entry."
Incomplete outcome data (attrition bias) All outcomes	High risk	Loss to follow-up: control 9/39 (23%), comprehensive CR 5/37 (14%), exercise-only CR 8/39 (20%)
Selective reporting (reporting bias)	Low risk	Outcomes reported in protocol are reported in main paper in addition to event and rate.

DeBusk 1994

Study characteristics	
Methods	**Study design:** multicentre RCT (5 sites); participants were randomised 3rd day post MI **Country:** USA **Dates participants recruited:** NR **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: men and women aged 70 years or younger who were hospitalised for AMI. **Exclusion criteria:** none described **N randomised:** total: 585; intervention: 293; comparator: 292 **Diagnosis (% of participants):** MI: 100% **Age (mean):** intervention: 57 ± 8; comparator: 57 ± 8 **Percentage male:** intervention: 78.5%; comparator: 79.1% **Ethnicity (white, %):** intervention: 78.0%; comparator: 75.9%
Interventions	**Intervention:** the exercise prescription was based on a heart rate range corresponding to 60% to 85% of the peak heart rate achieved during treadmill testing. Participants were instructed to exercise at the prescribed heart rate for 30 minutes per day 5 days per week. Participants walked briskly, jogged, rode a bicycle, or swam. After 4 weeks, the ceiling of the heart-rate training range was raised to 100% of the peak treadmill exercise heart rate or 85% of the age-predicted max HR. **Components:** exercise plus education **Setting:** nurse-managed, home-based **Exercise programme modality:** walking, jogging, cycling or swimming **Length of session:** 30 minutes per day **Frequency:** 5 days per week **Intensity:** 60% to 85% of the peak heart rate achieved during treadmill testing, then raised to 100% **Resistance training included?** No **Total duration:** 12 months **Co-interventions:** all medically eligible participants received exercise training; all smokers received the smoking cessation intervention; and all participants received dietary counselling and, if needed, lipid-lowering drug therapy **Comparator:** usual care including physician counselling on smoking cessation, nutritionist counselling on dietary change during hospitalisation, and physician-managed, lipid-lowering drug therapy after hospital discharge **Co-interventions:** group outpatient smoking cessation programmes were available for a $50 fee. Group exercise rehabilitation, not generally provided, was available to participants at various community facilities at an average cost of $1800 to $2700 for 3 months' participation.
Outcomes	Total mortality
Source of funding	Grant support: By HL38874 from the National Heart, Lung, and Blood Institute, Bethesda, Maryland and a Shannon Award from the National Institutes of Health, Bethesda, Maryland. Dr. Thomas participated as a Clinical Scholar of the Robert Wood Johnson Foundation.
Conflicts of interest	NR

DeBusk 1994 *(Continued)*

Notes	Levels of psychological distress dropped significantly for both groups by 12 months.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly allocated"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	33% lost to follow-up; no description of withdrawals and dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points described.

Dorje 2019

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** November 2016 to March 2017 **Maximum follow-up:** 12 months.
Participants	**Inclusion criteria**: participants aged 18 or older with documented coronary heart disease (including MI and unstable or stable angina) who were treated with PCI during their index admission. Participants were required to own an operational smartphone, have an active WeChat account or be willing to create one and have sufficient Chinese language proficiency to enable communication with the cardiac rehabilitation and secondary prevention coach via WeChat. **Exclusion criteria:** contraindications to exercise rehabilitation, an inability to operate a smartphone for the purpose of the trial (e.g. vision, hearing, and cognitive or dexterity impairment), no internet access at their place of residence, or pre-existing comorbid disease with a life expectancy less than 1 year. **N randomised:** total: 312; intervention: 156; comparator: 156 **Diagnosis (% of participants):** post PCI (100%) **Age (mean):** intervention: 61.9 ± 8.7; comparator: 59.1 ± 9.4 **Percentage male:** intervention: 126 (81%); comparator: 128 (82%) **Ethnicity (white, %):** NR
Interventions	**Intervention:** smartphone-based home cardiac rehabilitation delivered via WeChat platform. Included a simplified and culturally sensitive WeChat based education programme addressing coronary heart disease knowledge and awareness.

Dorje 2019 *(Continued)*

	Exercise component: individualised walking programme based on baseline 6MWT, with time and intensity of walking increased gradually over the first 8 weeks. Physical activity monitored using WeChat's inbuilt pedometer function to monitor step counts, along with a WeChat interfaced blood pressure and heart rate monitor. Support provided for medication adherence and risk factor modification (dietary change, lipid control, smoking cessation) provided as required by participants. Data readings automatically transmitted to a secure data portal and reviewed by cardiac rehabilitation coach on a regular basis and provided individualised feedback. **Components:** exercise plus education **Setting:** Home-based **Exercise programme modality:** walking **Length of session:** NR **Frequency:** at least 5 times per week **Intensity:** NR **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** none described **Comparator:** standard care as provided by their community doctors and cardiologists. Typically involves brief inpatient health education provided by a ward nurse, medication management and ad-hoc follow-up visits to a cardiologist or health care provider according to the participant's self-assessment of their own cardiovascular health **Co-interventions:** none described
Outcomes	HRQoL, adverse cardiac events
Source of funding	Curtin University
Conflicts of interest	None declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The randomisation sequence was computer-generated by permuted block randomisation (block size of 10), by staff from the study coordinating centre at Curtin University who were not involved with the recruitment of study participants."
Allocation concealment (selection bias)	Low risk	"The randomisation sequence was computer generated by staff from the study coordinating centre at Curtin university who were not involved with the recruitment of study participants."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"To maintain blinding of research personnel involved in follow-up assessments to group allocation, participants received a WeChat message before each follow-up visit, to remind them not to reveal their allocation to study personnel. Study personnel who helped participants to set up the SMART-CR/SP system on their smartphone or provided technology training before the commencement of the trial were not involved in assessments."

Dorje 2019 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Low risk	Missing participants balanced across the two groups (intervention: 22/156 (14%); control: 25/156 (16%)) with similar reasons, and maximum-likelihood estimation methods used in models to account for missing data.
Selective reporting (reporting bias)	High risk	Protocol paper (table 1) states that quality of life assessments would be carried out at 12 month follow-up, but these data have not been reported. All-cause mortality data not formally reported, just states that no adverse cardiac events occurred – unclear whether this is at 6 or 12 months.

Dugmore 1999

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** UK **Dates participants recruited:** between 1984 and 1988 **Maximum follow-up:** 5 years
Participants	**Inclusion criteria**: MI according to conventional WHO cardiac enzyme and ECG criteria of MI **Exclusion criteria:** NR **N randomised:** total: 124; intervention: 62; comparator: 62 **Diagnosis (% of participants):** MI: 100% **Age (years):** intervention: 54.8; comparator: 55.7 **Percentage male:** 98% intervention: NR; comparator: NR **Ethnicity:** NR
Interventions	**Intervention:** participants received regular aerobic and local muscular endurance training three times a week for 12 months. This consisted of warm-up and cool-down exercises, sit ups, wall bar/bench step ups, cycle ergometry, and a major component centred on the training of aerobic capacity, using walking and jogging. Training programmes were individually designed and based on the results of regular exercise tests and trial exercise prescriptions. **Components:** exercise only **Setting:** centre **Exercise programme modality:** walking, jogging and cycle ergometry **Length of session:** individually designed **Frequency:** 3 times a week **Intensity:** varied between approx 50% to 65% of measured peak oxygen uptake (VO_2) in the poor prognosis participants and 65% to 80% of peak VO_2 in those with a good prognosis **Resistance training included?** Yes - local muscular endurance training **Total duration:** 12 months **Co-interventions:** none described. **Comparator:** received no formal exercise training throughout the same 12-month period **Co-interventions:** none described

Dugmore 1999 *(Continued)*

Outcomes	CV mortality; non-fatal MI; HRQL at 4, 8, 12 months
Source of funding	NR
Conflicts of interest	NR
Notes	The population was subdivided into groups with good and bad prognoses. There were 36 participants with a good prognosis and 26 with a poor prognosis. Each group were matched with control participants.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly allocated"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants accounted for
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points described.

Engblom 1996

Study characteristics

Methods	**Study design:** single-centre open RCT **Country:** Finland **Dates participants recruited:** February 1986 to December 1987 **Maximum follow-up:** 5 years
Participants	**Inclusion criteria**: participants who underwent elective CABG **Exclusion criteria:** any other serious disease; > 65 years of age **N randomised:** total: 228; intervention: 119; comparator: 109 **Diagnosis (% of participants):** Previous unstable angina: intervention: 29; comparator: 31 Previous MI: intervention: 42; comparator: 46 Hypertension: intervention: 31; comparator: 23 LVEF: intervention: 70.3; comparator: 71.4

Engblom 1996 *(Continued)*

	Age (mean ± SD): intervention: 54.1 ± 5.9; comparator: 54.3 ± 6.2 **Percentage male:** 88% **Ethnicity:** NR
Interventions	**Intervention:** 6 to 8 weeks after the CABG, participants followed a 3-week general CR program, mainly based on exercises, including 24 hours of supervised activities consisting of ergometer cycle training, ball games, outdoor activities, gymnastics and swimming. The participants were also advised to increase their physical activity in leisure time. **Components:** exercise and education **Setting:** supervised group sessions at centre **Exercise programme modality:** ergometer cycle training, ball games, outdoor activities, gymnastics and swimming **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 3 weeks (plus an additional 5 days over a 30-month period) **Co-interventions:** participants participated in a 4-stage CR programme over 30 months, including dietary counselling and advice about the importance of healthy nutrition and economical cooking. **Comparator:** all of the participants in both groups received standard postoperative care which consisted of visits to the cardiac outpatient clinic 2, 6, 12, 24, 36 and 60 months after the CABG **Co-interventions:** none described
Outcomes	Mortality, CABG, HRQoL: Nottingham Health Profile
Source of funding	Grants from the Sauli Viikari Fund within the Cultural Foundation of Varsinais-Suomi, Turku, Finland
Conflicts of interest	NR
Notes	Five years after CABG, only 20% of participants were working, despite 90% of participants being in functional classes 1-2. Almost half of participants had retired pre-CABG. Many other factors affect return to work post-CABG - age, education, physical requirements of the job, type of occupation, self-employed status, non-work income, personality type, self-perception of working capacity and mostly length of absence from work pre-CABG.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	13% lost to follow-up; no description of withdrawals or dropouts

Engblom 1996 *(Continued)*

Selective reporting (reporting bias)	Low risk	All outcomes were reported for all time points described.

Erdman 1986

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** the Netherlands **Dates participants recruited:** September 1976 to March 1978 **Maximum follow-up:** 5 years
Participants	**Inclusion criteria**: first MI within 6 months before the first psychological investigation; < 65 years; meet three psychological inclusion criteria - one or more symptoms of the anxiety reaction, diminished self-esteem, positive motivation to take part in the programme **Exclusion criteria:** severe cardiomyopathy, severe valvular disorders, inadequate performance on exercise, unstable angina pectoris **N randomised:** total: 80; intervention: 40; comparator: 40 **Diagnosis (% of participants):** MI: 100 % **Age (years):** 51 years (range 35 to 60 years); intervention: NR; comparator: NR **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** two 1½ hour sessions of fitness training a week in a conventional gymnasium, supervised by a cardiologist. Each session consisted of a 15-min warm-up, gymnastics and jogging (both 15 min); sport such as volleyball, soccer and hockey (30 min), and relation exercises (15 min). **Components:** exercise and education **Setting:** supervised group sessions in centre **Exercise programme modality:** gymnastics, jogging and team sports **Length of session:** 90 min **Frequency:** twice a week. **Intensity:** NR **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** in cases of severe psychopathology, a psychologist or a psychiatrist was consulted. **Comparator:** home rehabilitation - participants received an educational brochure with guidelines and advice about physical fitness training and jogging. **Co-interventions:** treatment with either beta blockers or anticoagulants was given upon indication only and not as a prophylactic measure.
Outcomes	Mortality, non-fatal MI at 5 years
Source of funding	Dutch Heart Foundation

Erdman 1986 *(Continued)*

Conflicts of interest	NR
Notes	Complex presentation of results. Authors conclude that participants who will benefit from rehabilitation can be detected on psychological grounds. Those who have engaged in habitual exercise, but feel seriously disabled, yet do not feel inhibited in a group, will benefit from rehab.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"randomly allocated by means of a table for random numbers"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	29% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Fletcher 1994

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** USA **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: ≤ 73 years; CAD and physical disability. CAD documented by history of MI, coronary artery bypass surgery, PCI or angiographically demonstrated CAD; have the functional use of more than 2 extremities, 1 being an arm, in order to perform the exercise test and training protocols. **Exclusion criteria:** uncontrolled hypertension or diabetes mellitus, clinically significant cardiac dysrhythmias, unstable angina pectoris, cognitive deficits, or other problems that would interfere with compliance to the prescribed exercise and diet protocol. **N randomised:** total: 88; intervention: 41; comparator: 47 **Diagnosis (% of participants):** CAD and a physical disability **Age (mean ±SD):** intervention: 62 ± 8; comparator: 63 ± 7 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR

Fletcher 1994 *(Continued)*

Interventions	**Intervention:** participants were provided with a wheelchair ramp with rollers and a telephone electrocardiographic recording device. They were instructed to exercise using the ramp which essentially transformed their wheelchair into a stationary wheelchair ergometer. Specific instructions were to exercise 5 days/week for 20 minutes a day for a total of 100 minutes each week. **Components:** exercise plus education **Setting:** home **Exercise programme modality:** stationary wheelchair ergometer **Length of session:** 20 min **Frequency:** 5 days/week **Intensity:** 85% of predicted maximal heart rate **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** both groups received didactic and written dietary instruction from a registered dietitian on the American Heart Association Step I low-cholesterol, low-saturated fat diet. **Comparator:** usual care **Co-interventions:** participants in the control group received dietary instruction and were instructed to follow activity guidelines provided by their primary physician and health care team.
Outcomes	Total mortality, non-fatal MI at 6 months
Source of funding	United States Department of Education
Conflicts of interest	NR
Notes	The treatment programme decreased myocardial oxygen demand.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The same experienced cardiologist interpreted all echocardiograms and was unaware of randomization procedures"
Incomplete outcome data (attrition bias) All outcomes	High risk	32% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points.

Fridlund 1991

Study characteristics

Fridlund 1991 *(Continued)*

Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** September 1985 to March 1988 **Maximum follow-up:** 5 years
Participants	**Inclusion criteria**: 65 years or younger at the time of MI; independent living in the Health Care District after discharge from hospital; meaningful communication and rehabilitation that was not hindered by the MI or other serious illness **Exclusion criteria:** cerebral or cardiac disorders or serious alcohol abuse **N randomised:** total: 178; intervention: 87; comparator: 91 **Diagnosis (% of participants):** MI: 100% Angina: intervention: 32.1%; comparator: 33.3% **Age (years):** intervention: 55; comparator: 57.6 **Percentage male:** 87% intervention: 86.8%; comparator: 87.3% **Ethnicity:** NR
Interventions	**Intervention:** participants and their spouses visited the hospital for a 2-hour group session each week for 6 months. These group sessions consisted of a physical and a psychosocial part and were carried out together with a support team consisting of a physiotherapist, a physician and a rehabilitation nurse. The physical part consisted of both exercise and relaxation. **Components:** exercise plus psychosocial support **Setting:** centre **Exercise programme modality:** NR **Length of session:** 2 hrs **Frequency:** once a week **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 months **Co-interventions:** the psychosocial part contained eleven themes concerning lifestyle and risks after MI, and psychosocial consequences of MI **Comparator:** routine cardiac follow-up **Co-interventions:** none described
Outcomes	Total mortality, non-fatal MI, revascularisations
Source of funding	Swedish Heart Lung Foundation, National Association for Heart and Lung Patients, Sweden, and the County Council, Halland, Sweden
Conflicts of interest	NR
Notes	Positive long-term effects on physical condition, life habits, cardiac health knowledge. No effects found for cardiac events or psychological condition.

Risk of bias

Fridlund 1991 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly subdivided"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	32% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points (although absolute values not always given).

Giallauria 2008

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Italy **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: acute ST elevation MI **Exclusion criteria:** residual myocardial ischaemia, severe ventricular arrhythmias, AV block, valvular disease requiring surgery, pericarditis, severe renal dysfunction (creatinine > 2.5 mg/dL) **N randomised:** total: 61; intervention: 30; comparator: 31 **Diagnosis (% of participants):** MI: 100% **Age (mean ±SD):** intervention: 55.9 ± 3.1; comparator: 55.1 ± 3.7 **Percentage male:** intervention: 73%; comparator: 71% **Ethnicity:** NR
Interventions	**Intervention:** training sessions were supervised under continuous electrocardiography monitoring. Each session was preceded by a 5-min warm-up and followed by a 5-min cool-down. Exercise was performed for 30 min on a bicycle ergometer with the target of 60% to 70% of VO_2 peak achieved at the initial symptom-limited cardiopulmonary exercise test. Exercise workload was gradually increased until the achievement of the predefined target. **Components:** exercise only **Setting:** supervised in centre **Exercise programme modality:** bicycle ergometer **Length of session:** 40 min **Frequency:** 3 times a week

Giallauria 2008 *(Continued)*

	Intensity: target of 60% to 70% of VO_2 peak achieved at the initial symptom-limited cardiopulmonary exercise test **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** none described **Comparator:** discharged with generic instructions on maintaining physical activity and a correct lifestyle **Co-interventions:** none described
Outcomes	Fatal/non-fatal MI (6 month follow-up)
Source of funding	"None"
Conflicts of interest	"None"
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The physician performing all Doppler-echocardioraphy studies was....blinded to the patient allocation into the study protocol."
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants were accounted for.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Hambrecht 2004

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Germany **Dates participants recruited:** March 1997 to March 2001 **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: angina pectoris according to Canadian Cardiovascular Society class I–III, with documented myocardial ischaemia during stress-electrocardiogram and/or 99mTc scintigraphy and amenable to PCI. Only participants living within a 25 km radius of the host institution were recruited.

Hambrecht 2004 *(Continued)*

	Exclusion criteria: acute coronary syndromes or recent myocardial infarction (< 2 months); left main coronary artery stenosis > 25%; reduced left ventricular function (ejection fraction < 40%); significant valvular heart disease; insulin-dependent diabetes mellitus; previous coronary artery bypass graft or PCI; and conditions excluding regular exercise **N randomised:** total: 101; intervention: 51; comparator: 50 **Diagnosis (% of participants):** Stable CAD: 100% (class I to III angina pectoris) **Age (years ± SEM):** intervention: 62 ± 1; comparator: 60 ± 1 **Percentage male:** 100 % **Ethnicity:** NR
Interventions	**Intervention:** during the first 2 weeks, participants exercised in the hospital 6 times/day for 10 min on a bicycle ergometer at 70% of the symptom-limited max HR. Before discharge, a maximal symptom-limited ergospirometry was performed to calculate the target heart rate for home training, which was defined as 70% of the maximal heart rate during symptom-limited exercise. Participants were asked to exercise on their bicycle ergometer close to the target heart rate for 20 min per day and to participate in one 60 min group training session of aerobic exercise/week. **Components:** exercise only **Setting:** supervised exercise in hospital, followed by unsupervised at home plus weekly group training **Exercise programme modality:** bicycle ergometer **Length of session:** 10 minutes **Frequency:** 6 times a day. **Intensity:** 70% of symptom-limited max heart rate **Resistance training included?** No **Total duration:** 2 weeks, followed by 20 min per day unsupervised at 70% plus 60 min aerobic group training per week **Co-interventions:** all participants were recommended to receive acetylsalicyl acid, β-blockers, angiotensin-converting enzyme inhibitors and statins according to common guidelines. **Comparator:** stent angioplasty: “the target lesion was treated with PCI after a bolus of 10,000 IU of heparin with a 6F guiding catheter.” **Co-interventions:** all participants were given acetylsalicylic acid 100 mg/d and clopidogrel 300 mg/d on the day before the procedure.
Outcomes	Clinical symptoms, angina-free exercise capacity, myocardial perfusion, cost-effectiveness, and frequency of a combined clinical end point (death of cardiac cause, stroke, CABG, angioplasty, acute myocardial infarction, and worsening angina with objective evidence resulting in hospitalisation)
Source of funding	“This study was supported by an unconditional scientific grant from Aventis Germany".
Conflicts of interest	NR
Notes	2 year results of this study are reported by Walther 2008.

Risk of bias

Bias	Authors' judgement	Support for judgement

Hambrecht 2004 *(Continued)*

Random sequence generation (selection bias)	Low risk	"Patients were randomly assigned to either stent angioplasty or exercise training by drawing an envelope with the treatment assignment enclosed."
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Initially and after 12 months the angina pectoris status of all patients was classified according to CCS class by a physician blinded for patient assignment."
Incomplete outcome data (attrition bias) All outcomes	Low risk	Discontinued study, n: intervention 2/51; comparator 2/50 Disabling stroke, n: intervention 1/51; comparator 1/50 Refused angiography, n: intervention 1/51; comparator 0/50
Selective reporting (reporting bias)	Low risk	All outcomes reported.

Haskell 1994

Study characteristics	
Methods	**Study design:** multicentre RCT (4 sites) **Country:** USA **Dates participants recruited:** February 1984 to March 1987 **Maximum follow-up:** 4 years
Participants	**Inclusion criteria**: men and women < 75 years of age with clinically-indicated coronary arteriography who lived within a 5-hour drive of Stanford University and considered capable of following the study protocol. After arteriography, participants received PCI or CABG and remained eligible if at least one major coronary artery had a segment with lumen narrowing between 5% and 69% that was unaffected by revascularisation procedures. **Exclusion criteria:** severe congestive heart failure, pulmonary disease, intermittent claudication, or non-cardiac life-threatening illnesses; no qualifying segments, medical complication occurred during angiography, left ventricular ejection fraction of less than 20%, or participant was in another research study **N randomised:** total: 300; intervention: 145; comparator: 155 **Diagnosis (% of participants):** CHD: 100% **Age (mean ± SD):** intervention: 58.3 ± 9.2; comparator: 56.2 ± 8.2 **Percentage male:** 86% **Ethnicity:** NR
Interventions	**Intervention:** a physical activity programme consisting of an increase in daily activities such as walking, climbing stairs and household chores, and a specific endurance exercise training programme* with the exercise intensity based on the subject's treadmill exercise test performance. **Components:** exercise plus education **Setting:** home

Haskell 1994 *(Continued)*

	Exercise programme modality: stationary cycling or walking **Length of session:** 30 min **Frequency:** 5 days a week. **Intensity:** 70% to 85% of the peak heart rate attained on exercise testing at 3 weeks, an average of 96 to 121 beats/min **Resistance training included?** No **Total duration:** NR **Co-interventions:** each risk-reduction participant met with a nurse to design an individualised risk-reduction programme based on the participant's risk profile, his or her motivation, and resources for making specific changes. Participants were instructed by a dietitian in a low-fat, low-cholesterol, and high-carbohydrate diet with a goal of < 20% of energy intake from fat, < 6% from saturated fat, and < 75 mg of cholesterol per day. Current or recent ex-smokers were provided with an individualised stop-smoking or relapse-prevention programme by a staff psychologist. **Comparator:** usual care **Co-interventions:** none described
Outcomes	Total and CHD mortality, non-fatal MI, revascularisation at year 1, 2, 3 and 4
Source of funding	National Heart, Lung, and Blood Institute and a gift from the Claude R. Lambe Charitable Foundation. Lipid drugs for participants in the risk reduction group provided by the Upjohn Company, Merck & Company, and Parke-Davis, Inc.
Conflicts of interest	NR
Notes	*This exercise programme followed guidelines developed previously for home-based exercise training of cardiac patients (Miller 1984). The rate of change in the minimal coronary artery diameter was 47% less in intervention than comparator. This was still significant when adjusted for age and baseline segment diameter (P = 0.03).

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomization was performed using a random-numbers table."
Allocation concealment (selection bias)	Low risk	"....sequentially numbered, sealed opaque envelopes for each stratification category that were provided by the biostatistician".
Blinding of outcome assessment (detection bias) All outcomes	High risk	"The staff collecting data in the clinic were not blinded to group assignment of subjects".
Incomplete outcome data (attrition bias) All outcomes	High risk	18% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Hassan 2016

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Egypt **Dates participants recruited:** NR **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: age 40 to 60, within the first year after PCI, mean BMI ≤ 35 kg/m^2 **Exclusion criteria:** people with renal failure, chronic liver disease; people with arrhythmia, chest disease and those who could not fulfil the questionnaire or cooperate through the performed procedures **N randomised:** total: 60; intervention: 30; comparator: 30 **Diagnosis (% of participants):** post PCI **Age (mean ±SD):** intervention: 52.6 ± 5; comparator: 53.8 ± 5 **Percentage male:** intervention: 70%; comparator: 67% **Ethnicity:** NR
Interventions	**Intervention:** participants received mild to moderate exercise training and educational program of secondary prevention. Participants in the CR program were requested to attend their exercise program 3 times per week for 6 months. **Components:** exercise plus education **Setting:** centre-based **Exercise programme modality:** bicycle ergometer **Length of session:** 40 to 50 min **Frequency:** 3 days/week. **Intensity:** RPE 11-14 **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** none described **Comparator:** participants received instructions about risk factors after PCI once, and were followed up one year later. **Co-interventions:** none described
Outcomes	HRQoL
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	“Patients...were selected and assigned to two equal groups in number.” No further information

Hassan 2016 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants completed all follow-up assessments.
Selective reporting (reporting bias)	Unclear risk	Study protocol and trial registration unavailable

Hautala 2017

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Finland **Dates participants recruited:** February 2011 to May 2014 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: CAD patients who suffered from acute coronary syndrome, with coronary angiography to confirm the CAD. **Exclusion criteria:** NYHA class ≥ III, scheduled or emergency procedure for bypass surgery, unstable angina pectoris, severe peripheral atherosclerosis, diabetic retinopathy or neuropathy, or inability to perform regular home-based exercises, for example, due to severe musculo-skeletal problems **N randomised:** total: 204; intervention: 109; comparator: 95 **Diagnosis (% of participants):** intervention: NSTEMI 47 (48%); STEMI 44(45%); comparator: NSTEMI 45 (58%); STEMI 28 (36%) **Age (mean):** intervention: 60 ± 11; comparator: 62 ± 9 **Percentage male:** intervention: 80 (73%); comparator: 67 (71%) **Ethnicity (white, %):** NR
Interventions	**Intervention:** the 1-year exercise training intervention consisted of home-based aerobic (30 to 40 min) and gym-based strength exercises (30 to 40 min). On the first two visits to the gym, participants were provided instruction on use of the gym, a home-base exercise training program for the first month, how to fill in the exercise training diary, use of the RPE scale to evaluate the average intensity of a single exercise session, a schedule for gym visits, and use of an accelerometer. Thereafter, the participants exercised in the gym once per week for 6 months in groups of no more than eight participants. A wrist-worn accelerometer was provided to improve motivation and adherence. Participants instructed to continuously wear the accelerometer and monitor their own daily PA. After 6 months, home-based exercise continued and checkpoint visits to monitor progression of exercise training were scheduled at 9 and 12 months.

Hautala 2017 *(Continued)*

	Components: exercise plus other components such as dietary counselling or check-up by a medical doctor when appropriate. **Setting:** both centre and home (1 centre-based resistance training session per week for 6 months). **Exercise programme modality:** walking, running, cycling or cross-country skiing **Length of session:** 30 to 40 minutes **Frequency:** 4 to 5 per week **Intensity:** RPE 12-15 (aerobic), RPE 13 (resistance) **Resistance training included?** Yes - strength exercise circuit targeted at major muscle groups at moderate intensity (2-3 X 7 sets, ≥ 10 repetitions/set) RPE 13. **Total duration:** 1 year **Co-interventions:** None described **Comparator:** usual care – participants did not receive any individually-tailored exercise prescriptions. **Co-interventions:** none described
Outcomes	Mortality, hospitalisations, HRQoL, cost effectiveness
Source of funding	NR
Conflicts of interest	JMA is a partner of ESiOR Oy, which provides health economic and outcome research services to pharmaceutical and medical device companies. The other authors report no conflicts of interest.
Notes	Authors provided further data relating to clinical outcomes and HRQoL.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information provided regarding method used to generate allocation sequence
Allocation concealment (selection bias)	Unclear risk	No information provided regarding method used to conceal the allocation sequence
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided regarding blinding of outcome assessors
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Missing data balanced in numbers (intervention 28%, control 26%); missing data were imputed using appropriate methods, but reasons for loss to follow-up not reported.
Selective reporting (reporting bias)	Unclear risk	No published protocol available, clinical trial registry available, but outcome information is limited

He 2020

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** China

He 2020 *(Continued)*

	Dates participants recruited: August 2014 to October 2016 **Maximum follow-up:** 3 years
Participants	**Inclusion criteria:** (1) fulfilling Third Universal Definition of Myocardial Infarction criteria; (2) a coronary angiography that show no artery stenosis ≥ 50% in any infarct-related artery; (3) no other clinically overt cause or account for the acute presentation **Exclusion criteria:** (1) sepsis, cardiac contusion, pulmonary embolism, overlooked obstructive coronary artery disease (CAD), coronary emboli or thrombus, Takotsubo syndrome, and myocarditis; (2) limited exercise tolerance (ejection fraction <35%, chronic obstructive pulmonary disease with FEV1 <50%, severe anaemia); (3) age ≥ 75 years old; (4) physical disability or mental confusion; (5) individuals refused to participate in the trial **N randomised:** total: 524; intervention: 262; comparator: 262 **Diagnosis (% of participants):** 100% MI with PCI **Age (mean ±SD):** intervention: 60.6 ± 12.7; comparator 60.9 ± 12.9 **Percentage male:** intervention: 45.8%, comparator: 47.7% **Ethnicity:** NR
Interventions	**Intervention:** participants exercised 3x per week in the hospital for 20 to 30 min on a treadmill or bicycle at 65% to 75% of symptom limited maximal heart rate. After discharge, moderate continuous training was performed – cycling or treadmill running continuously at a moderate intensity (65% to 75% max HR) for 47 mins 3x per week. Participants used MI electronic band to monitor heart rate and physicians used WeChat software to instruct and supervise individuals each month during the follow-up period. The home-based program consisted of 52 exercise sessions (3x per week) each year. **Components:** exercise only **Setting:** centre- and home-based **Exercise programme modality:** treadmill walking/running or cycling **Length of session:** 20 to 30 minutes increasing to 47 minutes **Frequency:** three sessions per week **Intensity:** 65% to 75% of the symptom limited heart rate max **Resistance training included?** No **Total duration:** 3 years **Co-interventions:** none described **Comparator:** control participants did not receive CR **Co-interventions:** none described
Outcomes	MACE at 3 years, HRQoL at 1 year
Source of funding	Supported by Zhejiang Provincial Science Foundation of China under Grant No. LY20H020006 and Zhejiang Provincial Basic Public Welfare Research Program of China under Grant No. LGF19H020007
Conflicts of interest	None declared
Notes	Authors emailed to request further data (mortality, MI, hospitalisation) but no response
Risk of bias	
Bias	**Authors' judgement** **Support for judgement**

He 2020 *(Continued)*

Random sequence generation (selection bias)	Low risk	“randomly allocated either to an exercise-based cardiac rehabilitation group (CR+ group) or a control group (CR− group) on a 1:1 base by drawing an envelope with the assignment enclosed.”
Allocation concealment (selection bias)	Unclear risk	“drawing an envelope with the assignment enclosed”
Blinding of outcome assessment (detection bias) All outcomes	Low risk	“Only the members of The Safety and Monitoring Committee knew the group allocation. Data collectors and researchers were blind to the study group assignment.”
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow-up balanced across groups and reasons provided. 1 year (SF-36) intervention: 30/262 = 11%, control: 26/262 = 10% "10.7% dropout reported over the 3 year study period."
Selective reporting (reporting bias)	Unclear risk	Protocol paper and trial registration unavailable

Heller 1993

Study characteristics	
Methods	**Study design:** cluster-randomised multicentre RCT **Country:** Australia **Dates participants recruited:** 18 September 1990 to 5 December 1991 **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: < 70 years with a suspected heart attack registered by the Newcastle collaborating centre of the WHO MONICA Project and discharged alive from hospital **Exclusion criteria:** renal failure or other special dietary requirements and those considered by their physicians to have 'endstage' heart disease **N randomised:** total: 450; intervention: 213; comparator: 237 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 59 ± 8; comparator: 58 ± 8 **Percentage male:** 71% **Ethnicity:** NR
Interventions	**Intervention:** a mail-out programme designed to help participants reduce dietary fat, obtain regular exercise by walking and to quit smoking. • 1st package: Step 1 "Facts on fat" kit, together with walking programme information, encouragement to walk in the form of a magnetic reminder sticker, and "Quit for Life" programme for smokers. • 2nd package: Steps 2-3 "Facts on fat" kit; exercise log. • 3rd package: Steps 4-5 "Facts on fat" kit, together with information regarding local "Walking for Pleasure" groups. **Components:** exercise plus education

Heller 1993 *(Continued)*

	Setting: home **Exercise programme modality:** walking **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 months. **Co-interventions:** supplementary telephone contact was also used and a letter was sent to the family doctor regarding the benefit of aspirin and β blockers for secondary prevention. **Comparator:** usual care **Co-interventions:** none described
Outcomes	Total mortality, HRQL Study outcomes assessed at 6 months
Source of funding	National Health and Medical Research Council of Australia
Conflicts of interest	NR
Notes	Low use of preventative services (dietary, anti smoking) by both groups 10% of participants received CR - mostly having had CABG

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Cluster-randomisation by GP. "All general practices were randomly allocated to intervention or usual care within those strata." Method of randomisation not described.
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	17% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Higgins 2001

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Australia

Higgins 2001 *(Continued)*

	Dates participants recruited: June 1995 to January 1997 **Maximum follow-up:** Mean = 51 weeks; range = 36 to 56 weeks post PCI
Participants	**Inclusion criteria**: participants scheduled for PCI **Exclusion criteria:** major co-morbidity such as malignancy, a history of cerebrovascular accident, or other severe, chronic debilitating disease; previous CABG or peri-PCI complications; unemployment in previous year; MI within 1 month pre-procedure; surgical management at home time during the 1 year duration of study. **N randomised:** total: 105; intervention: 54; comparator: 51 **Diagnosis (% of participants):** Previous MI: intervention: 52%; comparator: 51% Previous PCI: intervention: 10%; comparator: 16% **Age (years):** intervention: 48 (range 31 to 63); comparator: 47 (range 26 to 63) **Percentage male:** intervention: 83 %; comparator: 96 % **Ethnicity:** NR
Interventions	**Intervention:** individualised comprehensive CR programme based on the principles of social cognitive theory involved a moderate-intensity walking programme with a graded increase in the frequency and duration of exercise. In the 2 months post-PCI, the clinician made 3 home visits to each participant and went walking with them as part of this visit. In addition, during home visits, participants were taught to monitor their rate of perceived exertion (RPE) during their walking programme and to document the frequency, duration and RPE of those sessions in an exercise log. **Components:** exercise plus psychological plus education **Setting:** home **Exercise programme modality:** walking **Length of session:** not specified – goal setting was based on personalised risk-factor profiles **Frequency:** NR **Intensity:** NR **Resistance training included?** No **Total duration:** not specified **Co-interventions:** the intervention group received the same education sessions as the control group as well as an individualised, comprehensive CR program based on the principles of social cognitive theory. Strategies used to modify risk factors included (1) goal setting, (2) self-monitoring and feedback, (3) skills training, (4) reinforcement of target behaviours, and (5) the provision of social support by the clinician. Vocational counselling included specific recommendations regarding return to work. The clinician also made monthly calls when she provided counselling and guidance. **Comparator:** whilst hospitalised, control participants received two, one-to-one bedside education sessions; one 45 min session pre-PCI and one 60 min session post-PCI. Teaching media included videotapes of the procedure, photographs of coronary anatomy during the procedure, and equipment. Post-PCI education included providing information about the pathology and risk factors for CHD and instruction on wound and medication management. **Co-interventions:** the clinician made 3 monthly post-discharge CHD information-focused telephone calls to each control participant.
Outcomes	Mortality
Source of funding	“Prince Charles Hospital Private Practice Fund supported the research”

Higgins 2001 *(Continued)*

Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients ……were randomly assigned to either control or intervention."
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	High risk	Assessments do not appear to be blinded.
Incomplete outcome data (attrition bias) All outcomes	High risk	Although all withdrawals and exclusions were clearly described and the number of withdrawals were similar in the intervention (5) and control (4) groups, 11 (20%) and 5 (10%) participants were lost from the intervention and control groups, respectively.
Selective reporting (reporting bias)	Low risk	All outcomes have been reported at all time points.

Hofman-Bang 1999

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** February 1993 to December 1995 **Maximum follow-up:** 2 years
Participants	**Inclusion criteria**: (a) at least one significant stenosis suitable for PTCA and at least one additional - although clinically non-significant - stenosis or plaque, measurable with quantitative computerised angiography (QCA); (b) age < 65 years; (c) employed; (d) absence of other diseases of importance for the programme or with poor prognosis; and (e) able to perform a bicycle ergometer test with a minimum exercise capacity of 70 watts. **Exclusion criteria:** none described **N randomised:** total: 87; intervention: 46; comparator: 41 **Diagnosis (% of participants):** treated with percutaneous transluminal angioplasty **Age (mean):** intervention: 53; comparator: 53 **Percentage male:** 83.9% **Ethnicity:** NR
Interventions	**Intervention:** started with a 4-week residential stay at the intervention unit. The programme included intense health education and activities promoting behavioural changes - stress management, diet, ex-

Hofman-Bang 1999 *(Continued)*

	ercise and smoking habits. Each subject was assigned a daily individual task including self-observation, Type A behavioural drills, relaxation training and exercise. Followed by 11-month structured maintenance programme. **Components:** exercise plus psychological plus education **Setting:** centre followed by home **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 12 months **Co-interventions:** maintenance programme consisted of continuous self-observation and self-recording of important everyday lifestyle behaviours, feedback of behaviour changes, and of regular follow-up contacts between the participant and his/her personal coach for verbal feedback, problem-solving, and replanning discussions when needed. **Comparator:** standard care **Co-interventions:** none described
Outcomes	Cardiovascular mortality, MI, CABG, PTCA, hospitalisations, health-related quality of life: Angina Pectoris Quality of Life Questionnaire (APQLQ) recorded during the 2 years' follow-up.
Source of funding	AMF Insurance Co., the SPP Insurance Co., and The Swedish Heart and Lung Foundation
Conflicts of interest	NR
Notes	93 participants were randomly assigned to an intervention group or a control group, respectively. Six subjects (two in the intervention group and four in the control group) refused further participation in close connection to randomisation.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly assigned"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	21.8% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Holmbäck 1994

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** "during a 2-year period" **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: acute MI patients under 65 years of age **Exclusion criteria:** not stated, but individuals have been excluded for being incapable of performing strenuous training due to poor left ventricular function or arrhythmias, orthopaedic disorders, other incapacitating somatic diseases or mental disorders. **N randomised:** total: 69; intervention: 34; comparator: 35 **Diagnosis (% of participants):** post-MI: 100% **Age (mean years [range]):** intervention: 55 (38 to 65); comparator: 55 (43 to 63) **Percentage male:** 97% **Ethnicity:** NR
Interventions	**Intervention:** started 8 weeks post-MI and participants trained over a 12-week period for at least 45 minutes (effective time) twice a week with interval training involving large muscle groups: bicycling (10 min), callisthenics (10 min), jogging (15 min) ending with relaxation (10 min). **Components:** exercise only **Setting:** not described, but assumed in a centre **Exercise programme modality:** bicycling 10 mins, callisthenics 10 min, jogging **Length of session:** at least 45 mins **Frequency:** twice per week. **Intensity:** 70% to 85% of peak heart at the bicycle test for initial session and workload individually adjusted to obtain the desired maximum heart rate if possible **Resistance training included?** Yes - callisthenics **Total duration:** 12 weeks **Co-interventions:** none described **Comparator:** received regular medical care with no emphasis on exercise **Co-interventions:** none described
Outcomes	Total mortality, non-fatal MI & revascularisation Health-related quality of life: self-report questionnaire Evaluations at 6 weeks and 1 year post-MI
Source of funding	Research support was given by Malmöhus County Council
Conflicts of interest	NR
Notes	Study authors found no benefit from exercise training. Outcomes were related to self-rated levels of physical and psychological well being.
Risk of bias	

Holmbäck 1994 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomization was performed according to random numbers in sealed envelopes".
Allocation concealment (selection bias)	Low risk	"Randomization was performed according to random numbers in sealed envelopes".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Evaluations were "supervised by independent investigators".
Incomplete outcome data (attrition bias) All outcomes	High risk	14.5% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points (although absolute values not always given).

Houle 2012

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** Canada **Dates participants recruited:** April 2007 to April 2008 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: participants hospitalised for an ACS (unstable angina, non-ST–elevation or ST elevation myocardial infarction) and willing to travel to the CR centre every 3 months to meet the clinical nurse specialist and able to read and speak French **Exclusion criteria:** inability to perform activities of daily living (such as feeding themselves, bathing, dressing, grooming, work, homemaking and leisure); enrolment in another research project or in a heart failure clinic where serial follow-up creates a bias and contraindication to exercise testing; medical diagnosis of debilitating chronic illness (such as cancer without remission), musculoskeletal or neurological disorder (such as multiple sclerosis, Parkinson's disease, etc.); people with a previous history of stroke could be included if they had no residual effects related to their stroke); serious and unstable mental incapacities or major depression **N randomised:** total: 65; intervention: 32; comparator: 33 **Diagnosis (% of participants):** Unstable angina: intervention: 50%; comparator: 52% STeMI: intervention: 28%; comparator: 27% Non STeMI: intervention:22%; comparator: 21% **Age (mean ± SD):** intervention: 58 ± 8; comparator: 59 ± 9 **Percentage male:** total: 78%; intervention: 81%; comparator: 76% **Ethnicity:** NR

Houle 2012 *(Continued)*

Interventions	**Intervention:** participants received a pedometer-based programme concomitantly with a socio-cognitive intervention led by a clinical nurse specialist. Participants used 1 pedometer blinded and used a second one to monitor their daily steps since discharge. **Components:** exercise plus education plus socio-cognitive intervention **Setting:** home **Exercise programme modality:** walking **Length of session:** not specified **Frequency:** not specified **Intensity:** not specified **Resistance training included?** No **Total duration:** 12 months **Co-interventions:** participants received a socio-cognitive intervention led by a clinical nurse specialist, and a blinded pedometer with instructions about how to wear the pedometer correctly during 7 consecutive days from morning to bedtime. **Comparator:** participants received the usual advice by the nurse or the physician, or both, at discharge regarding physical activity, diet and medication. They had no restriction to go to a centre-based cardiac rehabilitation programme or to consult a health care professional such as a nutritionist, an exercise specialist or a psychologist. Participants in both groups received usual medical follow-up by their own physicians (cardiologist and family physician). **Co-interventions:** participants received a blinded pedometer and instructions about how to wear the pedometer correctly during 7 consecutive days from morning to bedtime.
Outcomes	HRQoL
Source of funding	Heart and Stroke Foundation of Canada, Research centre of Institut Universitaire de Cardiologie et Pneumologie de Québec, and Pfizer Canada
Conflicts of interest	"Authors had no conflict of interest to declare".
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"They were randomly allocated to the experimental group or to the usual care group using a randomization table".
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Physical activity recorded by a blinded pedometer. However, blinding of assessors of other tests and measurements not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	Loss to follow-up was high in both groups: 9/32 (28%) and 11/33 (33%) were lost to follow-up from the intervention and control groups.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points described either in the paper or in the supplementary material online.

Kallio 1979

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** Finland **Dates participants recruited:** May 1973 to October 1975 **Maximum follow-up:** 3 years
Participants	**Inclusion criteria**: participants treated in hospital for acute myocardial infarction based on WHO criteria **Exclusion criteria:** NR **N randomised:** total: 375; intervention: 188; comparator: 187 **Diagnosis (% of participants):** AMI: 100% **Age (mean):** intervention: 54.4; comparator: 54.1 **Percentage male:** 80.3% **Ethnicity:** NR
Interventions	**Intervention:** the programme was started two weeks after discharge from hospital and consisted of medical examinations by an internist at least monthly for the first six months after AMI, then when necessary or at least 3-monthly. A physical exercise programme, tailored to the individual's working capacity determined in a bicycle ergometer test, was recommended, and for most participants, it was done under supervision. The rehabilitation programme was most intensive during the first three months after myocardial infarction. **Components:** exercise, education and psychological **Setting:** supervised in a centre **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** NR **Co-interventions:** besides the internist, the team included a social worker, a psychologist, a dietitian, and a physiotherapist. Health education consisted of anti-smoking and dietary advice, and discussions on psychosocial problems. **Comparator:** usual care **Co-interventions:** none described
Outcomes	Total mortality; cardiovascular mortality (follow-up 3 years).
Source of funding	Social Insurance Institution
Conflicts of interest	NR
Notes	

Kallio 1979 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly allocated"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	1% lost to follow-up
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Kovoor 2006

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** Australia **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: AMI; < 75 years of age; no angina; < 2 mm ST-segment depression with exercise and if they attained > 7-METS workload; left ventricular ejection fraction > 40% or no inducible ventricular tachycardia **Exclusion criteria:** participants were excluded if there was 2 mm ST-segment depression with exercise or if 7-METS workload was attained. **N randomised:** total: 142; intervention: 70; comparator: 72 **Diagnosis (% of participants):** AMI: 100% **Age (mean):** intervention: 56.2; comparator: 55.8 **Percentage male:** intervention: 89%; comparator: 86% **Ethnicity:** NR
Interventions	**Intervention:** exercise (conventional treatment group): 5 week rehabilitation program consisted of exercise, education and counselling sessions that were held 2 to 4 times per week, including work at 6 weeks after AMI. **Components:** exercise, education and psychological **Setting:** NR **Exercise programme modality:** NR

Kovoor 2006 *(Continued)*

	Length of session: NR **Frequency:** 2 to 4 times per week **Intensity:** NR **Resistance training included?** NR **Total duration:** 5 weeks **Co-interventions:** the 2 groups of participants were encouraged to exercise at home on a regular basis. Participants were given the telephone numbers of the cardiologist and the nurse co-ordinator so they could be contacted in case of problems. **Comparator:** control group (ERNA - early return to normal activities group): return to work at 2 weeks after AMI without a formal CR programme. **Co-interventions:** this group of participants was contacted over the telephone by the nurse co-ordinator once per week for 5 weeks. The 2 groups were encouraged to exercise at home on a regular basis. Participants were given the telephone numbers of the cardiologist and the nurse co-ordinator so they could be contacted in case of problems.
Outcomes	Total mortality; fatal/non-fatal mortality; CABG; PCI; HRQoL. Costs reported in Hall 2002. Assessment at 6 weeks and at 6 months
Source of funding	National Health and Medical Research Council, Sydney, Australia
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Method of randomisation not described
Allocation concealment (selection bias)	Low risk	"Randomization schedules were generated by an independent investigator and were kept in opaque sealed envelopes."
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"GHPS .... scans being analyzed in a blinded fashion by an independent nuclear medicine specialist." Blinding of other outcome assessments not described
Incomplete outcome data (attrition bias) All outcomes	High risk	20.4% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points

La Rovere 2002

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Italy

La Rovere 2002 *(Continued)*

	Dates participants recruited: 1984 to 1985 **Maximum follow-up:** 10 years
Participants	**Inclusion criteria**: post-MI patients admitted at Centro Medico di Montescano in 1984 to 1985 **Exclusion criteria:** atrial fibrillation or abnormal sinus node function, insulin-dependent diabetes, exercise-induced myocardial ischaemia, and arterial BP > 160/90 **N randomised:** total: 95; intervention: 49; comparator: 46 **Diagnosis (% of participants):** uncomplicated MI: 100% **Age (mean):** intervention: 51; comparator: 52 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** the exercise sessions (30 minutes, 5 times a week) consisted of callisthenics and stationary bicycle ergometry **Components:** exercise, education and psychological **Setting:** supervised in a centre **Exercise programme modality:** stationary bicycle ergometry **Length of session:** 30 minutes **Frequency:** 5 times a week **Intensity:** 75% of heart rate at peak $V0_2$, rising to 85% in the second and third weeks and 95% in the final week **Resistance training included?** Yes - callisthenics **Total duration:** 4 weeks **Co-interventions:** sessions were held by cardiologists and psychologists, dealing with secondary prevention of cardiovascular disease and stressing dietary changes and smoking cessation. **Comparator:** no training **Co-interventions:** all participants attended sessions, held by a cardiologist and a psychologist, dealing with secondary prevention of cardiovascular disease and stressing dietary changes and smoking cessation.
Outcomes	Cardiac mortality; non-fatal MI; CABG at 3 to 4 month intervals from the time of entry into the study for the first 3 years and contacted periodically by telephone thereafter.
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported

La Rovere 2002 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants accounted for
Selective reporting (reporting bias)	High risk	Results not reported for all time points collected

Lear 2015

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** Canada **Dates participants recruited:** February 2009 to April 2011 **Maximum follow-up:** 16 months
Participants	**Inclusion criteria**: participants residing in either the region serviced by the Northern Health Authority of British Columbia, or the Coast Garibaldi region, which is inaccessible by road, and residents must travel by either air or ferry to reach the Vancouver area. Participants must have been admitted for either acute coronary syndrome or revascularisation procedure, be at low or moderate risk based on the American Association of Cardiovascular and Pulmonary Rehabilitation guidelines at the time, had regular Internet access (home, work, or other environment), no physical limitations to regular physical activity, and be fluent in English. **Exclusion criteria:** people with previous experience with cardiac rehabilitation, depression, uncontrolled diabetes mellitus, and other significant comorbidities that may interfere with effective cardiovascular management, pregnant women and those who the attending physician thought were unsuitable for participation. **N randomised:** total: 78; intervention: 38; comparator: 40 **Diagnosis (% of participants):** intervention: NSTEMI 47 (48%) STEMI 44(45%); comparator: NSTEMI 45 (58%) STEMI 28 (36%). **Age (median, IQR):** intervention: 61.7, 51.3-65.2; comparator: 58.4 (52.8-64.7). **Percentage male:** intervention: 34 (90%); comparator: 32 (80%) **Ethnicity (white, %):** NR
Interventions	**Intervention:** web-based virtual cardiac rehabilitation program. 30-minute in-person training session on the use of the virtual CR program. Participants supplied with heart rate monitor and blood pressure monitor. Virtual CR program included online intake forms (medical, risk factor and lifestyle), scheduled one on one chat sessions with the program nurse or case manager, exercise specialist and dietician (3 times each during 12 weeks), weekly education sessions with interactive slide presentations, data capture for exercise stress test and blood test results, progress notes and monthly 'ask an expert' group chat sessions.

Lear 2015 *(Continued)*

	The home-page displayed the tasks that needed to be completed for each week. Participants were asked to wear heart rate monitor whilst exercising and upload exercise data at least twice per week into the system. **Components:** exercise plus education **Setting:** home-based **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 16 weeks **Co-interventions:** none described **Comparator:** usual care (care from primary care physician); participants were given simple guidelines for safe exercising and healthy eating habits and a list of internet-based resources. **Co-interventions:** none described
Outcomes	Cardiovascular-related emergency room and major events
Source of funding	Heart and Stroke Foundation of BC and Yukon and in part by Canada Health Infoway. Dr Lear holds the Pfizer/Heart and Stroke Foundation Chair in Cardiovascular Prevention Research at St. Paul's Hospital.
Conflicts of interest	None declared
Notes	Authors contacted for specific clinical outcomes, but no response received.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The random allocation was computer generated by a statistician unassociated with the trial who was the only one to have access to the list during the study."
Allocation concealment (selection bias)	Low risk	"The list was incorporated into a telephone randomization system to which the randomization research coordinator called for treatment allocation. The randomization research coordinator informed the participants of their group assignment."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome assessment reported to be blind – stress test technicians blinded, medical records were adjudicated by the study cardiologist (A.I.) blinded to the participant group assignment and categorized into emergency room visit events only and major cardiovascular events (revascularization, unstable angina requiring hospitalization, stroke, and death of any kind)." "The vCRP was evaluated in a 16-month randomized controlled trial with blinded outcome assessment".
Incomplete outcome data (attrition bias) All outcomes	Low risk	Low numbers of missing data in both groups, for similar reasons (intervention 12%, control 8%).
Selective reporting (reporting bias)	Low risk	No published protocol, but outcomes listed in trial registration appear to be reported.

Leizorovicz 1991

Study characteristics	
Methods	**Study design:** multicentre RCT (4 sites) **Country:** France **Dates participants recruited:** February 1981 to May 1984 **Maximum follow-up:** 2 years
Participants	**Inclusion criteria**: admitted to participating coronary care units with suspected MI; < 65 years old with typical MI, no major irreversible complication or disability **Exclusion criteria:** contraindication to exercise testing; i.e. recent stroke, disability of lower limbs, uncontrolled heart failure, severe rhythm disturbances, SBP > 180 mmHg, severe angina pectoris, or abnormalities triggered by baseline exercise test. **N randomised:** total: 182; intervention: 61; comparator (usual care): 60 counselling programme: 61 (no data analysed in this review) **Diagnosis (% of participants):** MI: 100% **Age (mean):** intervention: 51; comparator: 49 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** the programme started within a few days of randomisation and included three training sessions a week on a cycloergometer, walking and gymnastics. **Components:** exercise and education **Setting:** centre **Exercise programme modality:** cycloergometer, walking and gymnastics **Length of session:** 25 min **Frequency:** 3 times per week **Intensity:** 80% of max HR and then decreased progressively over 2 min (increased as the sessions progressed) **Resistance training included?** No **Total duration:** 6 weeks **Co-interventions:** also included respiratory physiotherapy, relaxation, recommendations on control of cardiovascular risk factors (smoking habits, diet); recommendations to continue regular physical training at the end of the 6-week programme. **Comparator:** participants in the usual care group were referred to their usual private practitioner or cardiologist or both. **Co-interventions:** None described
Outcomes	Non-fatal MI, angina, surgery
Source of funding	Institut National de la Same et de la Recherche Medicale, by the Hospices Civils de Lyon and by the Association pour la Promotion et la Realisation d'Essais Therapeutiques
Conflicts of interest	NR

Leizorovicz 1991 *(Continued)*

Notes	Only 14% of all MI patients admitted to the participating hospitals were randomised to the trial. Exclusion of women and patients > 65 accounted for 60% of exclusions.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	No losses to follow-up
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points (although absolute values not always given).

Lewin 1992

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Scotland, UK **Dates participants recruited:** March 1988 to March 1991 **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: confirmed MI (WHO criteria); age less than 80 years; able to speak and read English; resident in the hospital catchment area **Exclusion criteria:** known history of major psychiatric illness; current psychotic symptoms; evidence of dementia or continuing uncontrolled arrhythmias or heart failure **N randomised:** total: 176; intervention: 88; comparator: 88 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 55.3 ± 10.7; comparator: 56.3 ± 10.5 **Percentage male:** intervention: 70.0%; comparator: 72.7% **Ethnicity:** NR
Interventions	**Intervention:** heart manual consisted of six weekly sections that included education, a home-based exercise programme, and a tape-based relaxation and stress management programme. **Components:** exercise, education and psychological **Setting:** home

Lewin 1992 *(Continued)*

	Exercise programme modality: NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 weeks. **Co-interventions:** specific self-help treatments were provided for psychological problems commonly experienced by post-MI patients. Before the participant was discharged from hospital, spouses were given an audiotape that provided information and advice. After discharge, the facilitator made contact with both groups of participants at 1, 3 and 6 weeks, by telephone, at a hospital clinic, or, when neither of these was possible, by brief home visits. **Comparator:** the control group received an equal amount of the facilitator's time (approximately 10 min). **Co-interventions:** participants were given an extensive package of leaflets from various sources, intended to cover the same information as that presented in the manual.
Outcomes	HRQoL, Hospital Anxiety and Depression Scale (HAD), General Health Questionnaire (GHQ)
Source of funding	This research was supported by a grant from the Chief Scientist Office of the Scottish Home and Health Department. The British Heart Foundation donated additional computer equipment.
Conflicts of interest	NR
Notes	Study terminated (due to expiry of funding) before all participants reached 6-month or 12-month stage. Anxiety scores showed significant treatment effect at 6 weeks and 1 year, depression at 6 weeks. Pre-hospital discharge, 52% of all participants had HAD scores indicating clinically significant anxiety or depression (8+). Control group were significantly more anxious and depressed at all follow-ups.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"allocated to the experimental or control group by use of a written pre-determined randomisation protocol". Method of randomisation not described
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Questionnaires were scored and the data entered into the statistical analysis programme by a clerical assistant based at a separate hospital who was blind both to the experimental design and to the patients."
Incomplete outcome data (attrition bias) All outcomes	High risk	17% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points

Ma 2020

Study characteristics

Ma 2020 *(Continued)*

Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** January 2014 to December 2015 **Maximum follow-up:** 36 months (12 month intervention plus 24 month follow-up)
Participants	**Inclusion criteria**: angiographically diagnosed as unprotected left main coronary artery disease (ULM-CAD), and the 'unprotected' in this context was defined that no perfusion distal to the left main stenosis was supplied by either a patent bypass graft or a collateral vessel; underwent CABG for the first time; age ≥ 18 years; able to independently fulfil the assessment questionnaires used in the study; likely to be followed up regularly, which was evaluated by the investigators. **Exclusion criteria:** cardiogenic shock; cerebrovascular accident with a persistent neurological deficit before enrolment; complicated with malignancies; pregnant or lactating women. **N randomised:** total: 300; intervention: 150; comparator: 150. **Diagnosis (% of participants):** CABG (100%). **Age (mean, SD):** intervention: 63.1 ± 9.7; comparator: 62.8 ± 10.7. **Percentage male:** intervention: 121 (80.7%); comparator: 115 (76.7%). **Ethnicity (white, %):** NR
Interventions	**Intervention:** Comprehensive rehabilitation and intensive education (CRIE) program consisting of 4 components: 1. CAD-related health education (1/wk for 2 months) – lectures covering basic knowledge of disease, primary therapeutic strategies, risk factors, antiplatelet and anticoagulant therapy, BP management, lipid, glucose, and uric acid, prevention of upper GI mucosal injury, rehabilitation management about exercise, diet and nutrition, psychological care and good lifestyle formation. 2. Exercise guidance and formation (1/month for 10 months) – formulating an individualised exercise plan covering exercise mode: low intensity walking, moderate intensity aerobics (e.g. jogging, gymnastics, tai chi, bicycling), and moderate to high resistance training (e.g. mountain climbing, mid-distance sprint); duration 60 to 90 mins each time; frequency 3 to 5 times per week; intensity: RPE 11 to 13. Monthly supervision and guidance by motivational interviewing. 3. Risk factor control (1/month for 10 months): diet control, alcohol and cigarette cessation, management of blood pressure, lipid, glucose and uric acid. Monthly supervision and guidance by motivational interviewing. 4. Psychological nursing (1/month for 10 months): making a holistic assessment of each participants' physical, functional, psychological, social and spiritual status; identifying potential issues in psychological aspects; eliminating negative emotions and improving compliance; providing music therapy. **Components:** exercise plus education and psychological nursing **Setting:** centre-based lectures, with home-based exercise **Exercise programme modality:** low-intensity walking, moderate-intensity aerobics **Length of session:** 60 to 90 minutes **Frequency:** 3 to 5 sessions per week **Intensity:** RPE 11 to 13 **Resistance training included?** Yes: moderate-high intensity resistance training described as mountain climbing or mid-distance sprinting **Total duration:** 12 months **Co-interventions:** none described

Ma 2020 *(Continued)*

	Comparator: participants provided discharging guidance and a CAD-related health education manual (same as distributed to intervention group). Provided rehabilitation recommendations and medication consultation through telephone calls or clinic visits according to need. **Co-interventions:** None described
Outcomes	Major adverse cardiac and cerebrovascular events (composite outcome), HRQoL
Source of funding	Supported by National Clinical Key Speciality Construction Project
Conflicts of interest	None declared
Notes	We contacted authors, requesting specific clinical outcome data, but received no response.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The randomisation sequence was computer-generated using SAS 9.1"
Allocation concealment (selection bias)	Low risk	"The assignment of patients was performed by an independent nurse with the use of sealed envelopes"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided regarding blinding of outcome assessment.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Number of participants lost to follow-up provided (< 20%) and appear balanced across groups, but no reasons provided
Selective reporting (reporting bias)	Unclear risk	No published protocol paper or trial registration

Maddison 2014

Study characteristics

Methods	**Study design:** single-blind multicentre RCT (2 sites) **Country:** New Zealand **Dates participants recruited:** 2010 to 2012 **Maximum follow-up:** 24 weeks
Participants	**Inclusion criteria**: aged 18 years or more, with a diagnosis of IHD, defined as angina, myocardial infarction, revascularisation, including angioplasty, stent or coronary artery bypass graft within the previous 3 to 24 months. All participants were clinically stable as outpatients, able to perform exercise, able to understand and write English, and had access to the Internet (e.g. at home, work, library or through friends or relatives). **Exclusion criteria:** participants were excluded if they had been admitted to hospital with heart disease within the previous 6 weeks; had terminal cancer, or had significant exercise limitations other than IHD **N randomised:** total: 171; intervention: 85; comparator: 86

Maddison 2014 *(Continued)*

	Diagnosis (% of participants): IHD: 100% MI: 74% Angina: 50% **Age (mean ±SD):** total: 60.2 ± 9.3; intervention: 61.4 ± 8.9; comparator: 59.0 ± 9.5 **Percentage male:** total: 81%; intervention: 81%; comparator: 81% **Ethnicity:** NZ Maori: total: 8%; intervention: 7%; comparator: 8% Pacific: total: 6%; intervention: 6%; comparator: 6% Asian: total: 10%; intervention: 9%; comparator: 10% NZ European/other: total: 76%; intervention: 78%; comparator: 76%
Interventions	**Intervention:** the HEART programme is a personalised, automated package of text messages via mobile phones aimed at increasing exercise behaviour over 24 weeks. Participants received six messages per week for the first 12 weeks, five messages per week for 6 weeks, and then four messages per week for the remaining 6 weeks. **Components:** exercise **Setting:** home **Exercise programme modality:** moderate to vigorous aerobic-based exercise (e.g. walking and household chores) **Length of session:** minimum of 30 minutes **Frequency:** at least 5 days/week. **Intensity:** NR **Resistance training included?** No **Total duration:** 24 weeks **Co-interventions:** focus on altering the key mediators of behaviour change, including self-efficacy, social support and motivation. **Comparator:** usual care, with encouragement to be physically active and attend a cardiac club. **Co-interventions:** all participants were free to participate in any other CR service or support that they wished to use (e.g. participating in community-based CR education sessions on modifying CVD risk factors and psychological support), as well as encouragement to be physically active.
Outcomes	HRQoL, costs
Source of funding	Health Research Council of New Zealand and the Heart Foundation. Dr Maddison was supported by a Heart Foundation Research Fellowship and a Health Research Council Sir Charles Hercus Research Fellowship.
Conflicts of interest	None declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"....were randomly allocated..... by means of a central computerized service. Randomization was conducted using the minimization method, stratifying by

Maddison 2014 *(Continued)*

		sex (male and female), ethnicity (Maori – indigenous – and non-Maori), and exercise history"
Allocation concealment (selection bias)	Low risk	"Allocation concealment was maintained up to the point of randomization"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"This was a single-blind trial, where outcome assessors were blinded to treatment allocation"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow-up was well reported and was similar in both groups. 10/85 (12%) and 8/86 (9%) were lost to follow-up from the intervention and control groups, respectively.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section are reported in results.

Manchanda 2000

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** India **Dates participants recruited:** NR **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: chronic stable angina and angiographically proven CAD **Exclusion criteria:** recent (within last six months) MI or unstable angina **N randomised:** total: 42; intervention: 21; comparator: 21 **Diagnosis (% of participants):** chronic stable angina and angiographically proven CAD **Age (years):** intervention: 51; comparator: 52 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** participants and their spouses spent four days at a yoga residential centre where they underwent training in various yogic lifestyle techniques. Subsequently they carried out the yogic exercises at home for an average of 90 min daily. The programme included health rejuvenating exercises, breathing exercises, relaxation, meditation, reflection, stress management, dietary control and moderate aerobic exercises. **Components:** exercise, education and psychosocial support **Setting:** centre followed by home **Exercise programme modality:** yoga and "moderate aerobic exercises" **Length of session:** 90 min **Frequency:** daily **Intensity:** NR **Resistance training included?** No **Total duration:** 1 year

Manchanda 2000 *(Continued)*

	Co-interventions: relaxation, reflection, stress management, dietary control **Comparator:** managed by conventional methods i.e. risk factor control and American Heart Association step I diet. **Co-interventions:** none described
Outcomes	total mortality; CABG; PCI Assessments are baseline and 1 year
Source of funding	This study was supported in part by a grant from the Central Research Institute of Yoga, Ministry of Health, Government of India.
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Two independent observers who were blinded to group allocation analysed all arteriograms."
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants accounted for
Selective reporting (reporting bias)	High risk	While participants were given a clinical exam and clinical investigations every month, only the results at 1 year are presented.

Marchionni 2003

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Italy **Dates participants recruited:** NR (48-month period) **Maximum follow-up:** 14 months
Participants	**Inclusion criteria**: > 56 years; referred to unit for functional evaluation 4 to 6 weeks after MI **Exclusion criteria:** severe cognitive impairment or physical disability, left ventricular EF < 35%, contraindications to vigorous physical exercise, eligibility for myocardial revascularisation because of low-effort myocardial ischaemia, refusal, or living too far from the unit **N randomised:** total: 270; intervention: 90; home: 90; comparator: 90

Marchionni 2003 *(Continued)*

	Diagnosis (% of participants): MI*:* 100% **Age (mean [range]):** 69 years [46 to 86] **Percentage male:** 67.8% **Ethnicity:** NR
Interventions	Partcipants were randomised to outpatient, hospital-based CR (Hosp-CR), home-based CR (Home-CR), or no CR within 3 predefined age groups. **Intervention:** Hospital-CR: programme consisted of 40 exercise sessions: 24 sessions (3/wk) of endurance training on cycle ergometer (5-min warm-up, 20-min training at constant workload, 5-min cool-down, 5-min post-exercise monitoring) plus 16 (2/wk) 1-hr sessions of stretching and flexibility exercises. Home-CR: 4 to 8 supervised instruction sessions in CR unit, where taught how to perform training at home; then participants received exercise prescription similar to Hosp-CR group. **Setting:** centre or home **Components:** Hospital-CR: exercise plus psychosocial support Home-CR: exercise plus psychosocial support **Exercise programme modality:** cycle ergometer **Length of session:** 35 min endurance training; 1 hour stretching and flexibility exercises **Frequency:** 3 per week of endurance training; 2 per week of stretching and flexibility exercises **Intensity:** 70% to 85% of heart rate **Resistance training included?** No **Total duration:** 8 weeks **Co-interventions:** participants received cardiovascular risk factor management counselling twice per week and were invited to join a monthly support group together with family members. **Comparator:** participants randomised to no CR were referred back to their family physicians. **Co-interventions:** participants received asingle structured education session on cardiovascular risk factor management.
Outcomes	HRQoL at month 2, 8 and 14 Costs over study duration
Source of funding	National Research Council (CNR), the University of Florence, and the Regional Government of Tuscany, Italy
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported

Marchionni 2003 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Testing personnel were blinded to patient assignment."
Incomplete outcome data (attrition bias) All outcomes	High risk	38 (14.1%) dropped out; clinical event data for these participants not reported per treatment group
Selective reporting (reporting bias)	Low risk	Changes in all outcomes reported for all time points (although absolute values not given)

Maroto 2005

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Spain **Dates participants recruited:** NR (2-year enrolment period) **Maximum follow-up:** 10 years
Participants	**Inclusion criteria**: male participants diagnosed with AMI and admitted to the coronary care unit; age < 65 years; low risk (hospital course without complications, absence of signs of myocardial ischaemia, functional capacity > 7 metabolic equivalent time (MET), ejection fraction > 50%, and absence of severe ventricular arrhythmias) **Exclusion criteria:** none described **N randomised:** total: 180; intervention: 90; comparator: 90 **Diagnosis (% of participants):** AMI: 100% Anterior: intervention: 40.0%; comparator: 48.3% Inferior/posterior: intervention: 48.3%; comparator: 46.3% Non-Q wave: intervention: 11.6%; comparator: 5.3% **Age (mean ± SD):** intervention: 50.3 ± 6; comparator: 52.6 ± 9 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** Multidisciplinary CR programme, consisting of: • three months supervised, individualised physical training; • psychological programme including behavior modification techniques, group therapy, and relaxation sessions; • educational programme on modifying lifestyle and controlling coronary risk factors; • return to work counselling.

Maroto 2005 *(Continued)*

	Supervised training was complemented by progressively increasing daily walks of 1 hour in duration, when participants tried to maintain the heart rate achieved during training. Walks were undertaken by participants individually and were unsupervised. **Components:** exercise plus psychological plus education plus return to work counselling **Setting:** individualised supervised programme in hospital gym **Exercise programme modality:** physiotherapy and aerobic training on mats or an exercise bicycle **Length of session:** 1-hour sessions **Frequency:** 3 times per week **Intensity:** 75% to 85% max HR. **Resistance training included?** No **Total duration:** 3 months **Co-interventions:** participants received a psychological programme including behaviour modification techniques, group therapy, and relaxation sessions, an educational programme on modifying lifestyle and controlling coronary risk factors, and return to work counselling. **Comparator:** participants received conventional treatment **Co-interventions:** none described
Outcomes	Mortality, MI
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"The 180 patients were randomized into 2 groups".
Allocation concealment (selection bias)	Unclear risk	Allocation concealment is not described.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	7/90 lost to sample in intervention group and 4/90 lost to sample in control group.
Selective reporting (reporting bias)	Low risk	All outcomes described in methods section are reported at all time points.

Miller 1984

Study characteristics	
Methods	**Study design:** RCT; participants randomised 3 weeks post-MI

Miller 1984 *(Continued)*

	Country: USA **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: men < 70 years with MI documented by the combination of characteristic elevation of serum creatine kinase or oxaloacetic transaminase, a history of prolonged chest pain consistent with myocardial infarction, and the appearance of new Q waves or evolutionary ST segment changes. **Exclusion criteria:** conditions that precluded symptom-limited treadmill testing 3 weeks after infarction. e.g. congestive heart failure, unstable angina pectoris, valvular heart disease, atrial fibrillation, bundle branch block, stroke, limiting orthopedic abnormalities, peripheral vascular disease, chronic obstructive pulmonary disease and obesity, a history of coronary artery bypass graft (CABG) surgery, re-infarction before testing, and intercurrent noncardiac illness. **N randomised:** total: 198; group 1: 66; group 2: 61; group 3: 34; comparator: 37 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** 52 ± 9 **Percentage male:** 100% **Ethnicity:** NR
Interventions	Participants were randomly assigned to one of four exercise protocols: • group 1: 8 to 26 weeks of training at home; • group 2: training in a group programme; • group 3: treadmill testing at 3 weeks without subsequent training; • control: treadmill testing for the first time at 26 weeks. Regimens of home and group exercise training were designed to provide a similar intensity and duration of exercise training. **Intervention:** home training **Components:** exercise only **Setting:** home **Exercise programme modality:** stationary cycling or walking **Length of session:** 30 min **Frequency:** 5 days a week **Intensity:** weeks 3 to 11: 70% to 85% of the peak heart rate at week 3; weeks 11 to 26: 70% to 85% of the peak heart rate at week 11. **Resistance training included?** No **Total duration:** 8 weeks **or** 26 weeks. **Co-interventions:** none described **Intervention:** group training **Components:** exercise **Setting:** supervised in centre **Exercise programme modality:** walking or jogging **Length of session:** 1 hour **Frequency:** 3 times a week **Intensity:** participants regulated their training intensity by palpation of the radial or carotid pulse during the first 10 sec after brief cessation of walking or jogging.

Miller 1984 *(Continued)*

	Resistance training included? No **Total duration:** 8 weeks **or** 26 weeks **Co-interventions:** none described **Comparator:** usual care (treadmill testing for the first time at 26 weeks) **Co-interventions:** none described
Outcomes	CHD mortality, non-fatal MI and revascularisation
Source of funding	Supported by grant from the NHLBI, Bethesda, and by a grant from the PepsiCo Foundation, Purchase, NY
Conflicts of interest	NR
Notes	Low rate of cardiac events reflects identification of low risk population

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	5% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points

Munk 2009

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Norway **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: successful PCI, defined as a residual diameter stenosis after stent implantation of < 20% of the reference diameter **Exclusion criteria:** history of myocardial infarction (MI) or CABG; significant valvular heart disease; > 80 years; inability to give informed consent; inability to participate in regular training due to residency,

Munk 2009 *(Continued)*

	work situation or comorbidity; any known chronic inflammatory disease other than atherosclerosis, or planned surgery within the next 6 months. **N randomised:** total: 40; intervention: 20; comparator: 20 **Diagnosis (% of participants):** Stable angina, post PCI: intervention: 85%; comparator: 95% Unstable angina, post PCI: intervention: 15%; comparator: 5% **Age (mean ± SD):** intervention: 57 ±14; comparator: 61 ± 10 **Percentage male:** Total: 21%; intervention: 18%; comparator: 25% **Ethnicity:** NR
Interventions	**Intervention:** starting 11 ± 4 days after PCI, the training model included 10 min warm-up at 60% to 70% of max HR, followed by 4 min intervals at 80% to 90% of max HR, when participants were riding an ergometric bicycle or were running. Intervals were interrupted by 3 minutes of active recovery at 60% to 70% of maximal heart rate. Afterwards, there was a 5-min cool-down, 10 min of abdominal and spine resistance exercises, and 5 min of stretching and relaxing. The training sessions were monitored with individual pulse watches allowing the participant to achieve the target heart rate. **Components:** exercise only **Setting:** centre-based supervised training in groups of 10 **Exercise programme modality:** ergometric bicycle or running **Length of session:** 1 hour **Frequency:** 3 times a week **Intensity:** 60% to 70% max HR **Resistance training included?** Spine & abdominal resistance exercises **Total duration:** 6 months **Co-interventions:** none described **Comparator:** participants received usual care (not described), including drug therapy of clopidogrel, aspirin and statins **Co-interventions:** none described
Outcomes	Mortality, MI, and revascularisations
Source of funding	Norwegian Health Association, Oslo, Norway, and Stavanger University Hospital
Conflicts of interest	NR in this paper, but none declared in Munk 2011
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The order of treatments within the block was randomly permuted by a computer-generated sequence."
Allocation concealment (selection bias)	Low risk	"The investigator, who recruited patients into the trial, was unaware of the group to which a participant was allocated."

Munk 2009 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Low risk	"All scans were analysed twice with EchoPACtm (GE Vingmed Ultrasound) by two blinded investigators. Two experienced cardiologists independently interpreted the images in a blinded manner." However, not clear if blinded for clinical events and exercise capacity.
Incomplete outcome data (attrition bias) All outcomes	Low risk	"No patient was lost to follow up."
Selective reporting (reporting bias)	Low risk	All outcomes described in methods were reported at all time points.

Mutwalli 2012

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Kingdom of Saudi Arabia **Dates participants recruited:** 8 June 2008 to 3 January 2010 **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: participants admitted for coronary artery bypass graft (CABG) surgery **Exclusion criteria:** history of ejection fraction less than 30%, poor mobility leading to difficulty in walking, chronic atrial fibrillation, repeat CABG or implantable pacemaker were excluded from the study. **N randomised:** total: 49; intervention: 28; comparator: 21 **Diagnosis (% of participants):** post-CABG: 100% **Age (years):** intervention: 56.75 (range 53.6 to 59.8); comparator: 57.22 (range 54.4 to 60.2) **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** whilst in the cardiac ward, the participants walked daily for 30 minutes. Additionally, before discharge, the participants climbed one flight of stairs and were then asked to walk unaided at a comfortable pace 30 minutes per day until they completed the 6-month home-based CR programme. **Components:** exercise plus education **Setting:** at home, unsupervised with telephone support **Exercise programme modality:** walking **Length of session:** 30 minutes **Frequency:** daily **Intensity:** NR **Resistance training included?** No **Total duration:** 6 months **Co-interventions:** participants received pre-CABG, immediately post-CABG, and home-based CR program, including education, food management education and a one-hour group workshop which included advice on modifiable and non-modifiable risk factors, change of lifestyle, active life, stress, and then discussed participant's problems and feelings during the past 2 months. This group workshop was repeated 4 months and 6 months after hospital discharge.

Mutwalli 2012 *(Continued)*

	Comparator: the control group received standard hospital care, including regular advice from doctors and followed usual hospital instructions. This did not include a rehabilitation programme or telephone calls by the study authors. **Co-interventions:** None described
Outcomes	Mortality, MI, hospitalisation and HRQoL
Source of funding	"Work was not supported or funded by any drug company."
Conflicts of interest	"Authors have no conflict of interests."
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients who consented to participate in the study, were randomly assigned...."
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	7/50 participants (14%) lost to follow-up: one from control group died (1/22, 5%) and 6 from the intervention group (6/28, 21%) could not complete the study requirements.
Selective reporting (reporting bias)	Low risk	All outcomes described in methods are reported at all time points.

Oerkild 2012

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Denmark **Dates participants recruited:** January 2007 to July 2008 **Maximum follow-up:** 12 months; mortality data after 5.5 years (mean follow-up 4½ years)
Participants	**Inclusion criteria**: participants ≥ 65 years with a recent coronary event defined as acute myocardial infarction (MI), percutaneous transluminal coronary intervention (PCI) or coronary artery bypass graft (CABG) and who declined participation in centre-based CR **Exclusion criteria:** mental disorders (dementia), social disorders (severe alcoholism and drug abuse), living in a nursing home, language barriers or use of wheelchair **N randomised:** total: 40; intervention: 19; comparator: 21 **Diagnosis (% of participants):**

Oerkild 2012 *(Continued)*

	Previous MI: intervention: 31.7; comparator: 38.1 Previous PCI: intervention: 21.1; comparator: 23.8 Previous CABG: intervention: 0; comparator: 9.5 Heart failure LVEF ≤ 45%: intervention: 50.0; comparator: 42.9 **Event prior to entry into the study:** Post-MI without invasive procedure: intervention: 0; comparator: 19.1 Post-PCI: intervention: 84.2; comparator: 66.7 Post-CABG: intervention: 15.8; comparator: 14.3 **Age (mean ± SD):** intervention: 77.3 ± 6.0; comparator: 76.5 ± 7.7 **Percentage male:** intervention: 63.2%; comparator: 52.3% **Ethnicity:** NR
Interventions	**Intervention:** individualised exercise programmes followed the international recommendations with 30 min exercise/day including 5- to 10-min warm-up (e.g. slow walking) and 10-min cool-down at a frequency of 6 days/week at an intensity of 11 to 13 on the Borg scale. For very disabled participants, the exercise programmes were of shorter duration but then repeated several times a day. At 4 and 5 months, a telephone call was made by the cardiologist to encourage continuous exercising and to answer any medical questions. **Components:** exercise plus risk factor management **Setting:** unsupervised individualised programme at home, with telephone support **Exercise programme modality:** individualised **Length of session:** 30 min **Frequency:** 6 days a week **Intensity:** 11 to 13 on the Borg scale **Resistance training included?** No **Total duration:** 12 months **Co-interventions:** the participants consulted a cardiologist at baseline and after 3, 6 and 12 months, regarding risk factor intervention and medical adjustment. All participants were offered dietary counselling and, if required, smoking cessation. **Comparator:** participants received usual care. They received consultation with a cardiologist, and telephone calls at 4 and 5 months. They were not offered exercise education or dietary counselling. **Co-interventions:** participants were offered risk factor intervention and medical adjustment by a cardiologist at baseline and after 3, 6 and 12 months.
Outcomes	Mortality, HRQoL
Source of funding	Velux Foundations
Conflicts of interest	None
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement

Oerkild 2012 *(Continued)*

Random sequence generation (selection bias)	Low risk	"Patients were randomised in alternated block sizes of 4–6 using computer-generated randomly permuted blocks".
Allocation concealment (selection bias)	Low risk	"An impartial person, not related to the study, randomised the patients".
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	"Because of the nature of the intervention, concealment of randomisation was not feasible with regard to both patients and researcher". It is not clear if outcome measures are blinded.
Incomplete outcome data (attrition bias) All outcomes	Low risk	"A total of nine patients died during a mean follow-up of 4.5 years (usual care group n=5 and home group n=4). There was no loss to follow-up."
Selective reporting (reporting bias)	High risk	Although the methods state that outcomes were measured at 3, 6 and 12 months, only exercise capacity is reported at 6 months.

Oldridge 1991

Study characteristics	
Methods	**Study design:** multicentre RCT (6 sites) **Country:** Canada **Dates participants recruited:** NR **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: diagnosis of AMI and scoring > 5 on the short form of the Beck Depression Inventory or > 43 on the Spielberger State Anxiety Inventory or > 42 on the Spielberger Trait Anxiety Inventory while still in hospital **Exclusion criteria:** residence > 30 miles from the Health Sciences Centre; inability to exercise due to uncontrolled dysrhythmias, heart failure or unstable angina; neurologic, orthopedic, peripheral vascular or respiratory disease; and inability to complete the quality of life questionnaires due to cognitive or language problems **N randomised:** total: 201; intervention: 99; comparator: 102 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 52.9 ± 9.5; comparator: 52.7 ± 9.5 **Percentage male:** intervention: 88%; comparator: 90% **Ethnicity:** NR
Interventions	**Intervention:** participants attended 50-min exercise sessions twice a week for 8 consecutive weeks. These sessions were held in a hospital gymnasium under the direct supervision of a cardiologist and qualified exercise specialists. There was a I0-min group warm-up at the beginning of each session; stationary cycle ergometry, treadmill walking and arm ergometry followed for 20 to 30 minutes. A cool-down, involving low-intensity activities, concluded the exercise session. **Components:** exercise and behavioural counselling **Setting:** centre **Exercise programme modality:** stationary cycle ergometry, treadmill walking and arm ergometry

Oldridge 1991 *(Continued)*

	Length of session: 50 min **Frequency:** twice a week **Intensity:** initially on 65% of the maximal heart rate **Resistance training included?** No **Total duration:** 8 weeks **Co-interventions:** the cognitive behavioural group intervention, facilitated by group leaders without formal training in counselling, consisted of 8 sessions of 90 minutes complemented by progressive relaxation training at the end of the session. Both participant and spouse were invited to attend the group sessions. **Comparator:** conventional care **Co-interventions:** none described
Outcomes	Mortality. Health-related quality of life: QOLMI time trade-off. Cost data reported in Oldridge 1993
Source of funding	This work was supported by the National Health Research and Development Programme, Health and Welfare, Canada
Conflicts of interest	NR
Notes	Both groups improved over 12 months, with the biggest changes occurring in the first 8 weeks.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	High risk	"the investigators were not blinded to allocation"
Incomplete outcome data (attrition bias) All outcomes	High risk	For the primary outcome - HRQL - 9% lost to follow-up; no description of withdrawals or dropouts
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Ornish 1990

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** USA **Dates participants recruited:** NR **Maximum follow-up:** 5 years

Ornish 1990 *(Continued)*

Participants	**Inclusion criteria**: age 35 to 75 years, male or female; residence in the greater San Francisco area; one, two, or three vessel CAD (defined as any measurable coronary atherosclerosis in a non-dilated or non-bypassed coronary artery); LVEF > 25% **Exclusion criteria:** other life-threatening illnesses; MI during the preceding 6 weeks, history of receiving streptokinase or alteplase; currently receiving lipid-lowering drugs; scheduled to receive CABG **N randomised:** total: 48; intervention: 28; comparator: 20 **Diagnosis (% of participants):** moderate to severe CAD: 100% **Age (mean ±SD):** Intervention: 56.1 ± 7.5; Comparator: 59.8 ± 9.1 **Percentage male:** Intervention: 95%; Comparator: 79% **Ethnicity:** NR
Interventions	**Intervention:** the intervention began with a week-long residential retreat at a hotel to teach the lifestyle intervention to the experimental-group participants. Participants then attended regular group support meetings (4 h twice a week). Participants were individually prescribed exercise levels (typically walking) according to their baseline treadmill test results. Participants were asked to exercise for a minimum of 3 h per week and to spend a minimum of 30 min per session exercising within their target heart rates. **Components:** exercise plus psychosocial and diet **Setting:** centre **Exercise programme modality:** typically walking **Length of session:** minimum of 30 min **Frequency:** up to 6 times a week **Intensity:** heart rate of 50-80% **Resistance training included?** No **Total duration:** 1 year **Co-interventions:** stress management, low fat vegetarian diet, group psychosocial support **Comparator:** usual care **Co-interventions:** none described
Outcomes	CHD mortality, non-fatal MI, revascularisation Assessment at baseline and after 1 year and 5 years
Source of funding	National Heart, Lung, and Blood Institute of the National Institutes of Health, the Department of Health Services of the State of California, Gerald D. Hines Interests, Houston Endowment Inc, the Henry J. Kaiser Family Foundation. the John E. Fetzer Institute, Continental Airlines, the Enron Foundation, the Nathan Cummings Foundation, the Pritzker Foundation, the First Boston Corporation, Quaker Oats Co., Texas Commerce Bank, Corrine and David Gould, Pacific Presbyterian Medical Center Foundation, General Growth Companies, Arthur Andersen and Co.
Conflicts of interest	NR
Notes	Intervention group had 91% reduction in reported frequency of angina after 1 year and 72% after 5 years; comparator group had 186% increase in reported frequency of angina after 1 year and 36% decrease after 5 years. Intervention group had 7.9% relative improvement in coronary artery diameter at 5 years, comparator group had 27.7% relative worsening at 5 years.
Risk of bias	

Ornish 1990 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly assigned"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Investigators carrying out all medical tests remained unaware of both patient group assignment and the order of the tests".
Incomplete outcome data (attrition bias) All outcomes	High risk	45/93 (48%) of randomised participants did not participate; no description of withdrawals or dropouts
Selective reporting (reporting bias)	High risk	Outcomes are only presented for 1 year, although blood tests were also taken at 6 months.

Pal 2013

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** India **Dates participants recruited:** February 2007 to July 2010 **Maximum follow-up:** 18 months
Participants	**Inclusion criteria**: “Patients with proven CAD were recruited. Disease was diagnosed by history of electrocardiograms, echocardiography and treadmill testing. Their willingness to complete the entire span of the project (18 months) was assured.” **Exclusion criteria:** “Patients who had other co-morbid conditions (e.g. malignant hypertension, diabetes mellitus, chronic obstructive pulmonary disease, asthma, diseases of the nervous system, endocrinal disorders, congenital heart disease) and patients with known complications of CAD, those on pacemakers, and those who had undergone bypass surgery were excluded from the study” **N randomised:** total: 258; intervention: 129; comparator: 129 **Diagnosis (% of participants):** participants with proven CAD (100%) **Age (mean ±SD):** Intervention: 59.1 ± 9.9; Comparator: 56.4 ± 10.9 **Percentage male:** intervention: 80%; comparator: 81% **Ethnicity:** NR
Interventions	**Intervention:** yogic intervention plus medication performed in the Department of Physiology at Chhatrapati Sahuji Maharah Medical University under the guidance and supervision of yoga experts. 35 to 40 minutes per day, for 5 days per week over 18 months. **Components:** exercise only **Setting:** centre **Exercise programme modality:** yoga

Pal 2013 *(Continued)*

	Length of session: 35 to 40 minutes **Frequency:** 5 times a week **Intensity:** NR **Resistance training included?** No **Total duration:** 18 months **Co-interventions:** none described **Comparator:** medication only **Co-interventions:** none described
Outcomes	All-cause mortality reported in study flow diagram
Source of funding	Department of AYUSH, Ministry of Health and Family Welfare, Government of India
Conflicts of interest	None declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Using a random number generator... A professional not associated with this study generated the randomization scheme."
Allocation concealment (selection bias)	Low risk	"A professional not associated with this study generated the randomization scheme."
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding of yoga instructors, study personnel and outcome assessors was not described
Incomplete outcome data (attrition bias) All outcomes	High risk	19% in the intervention group and 20% in the control group lost to follow-up. Reasons were described and "Patients who dropped out of the study did not differ significantly in terms of age and sex".
Selective reporting (reporting bias)	Unclear risk	No published protocol or trial registration available. Triallists state that this study is part of "a larger study conducted under the Extra Mural Research Project of the Department of Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), at the Indian Ministry of Health and Family Welfare" but no reference provided.

Pomeshkina 2017

Study characteristics

Methods	**Study design:** single-centre RCT with 3 arms (supervised cycling vs home-based walking vs control) **Country:** Russia **Dates participants recruited:** NR **Maximum follow-up:** 12 months

Pomeshkina 2017 *(Continued)*

Participants	**Inclusion criteria**: male with coronary artery disease, planned myocardial revascularisation surgery (cardiopulmonary bypass) **Exclusion criteria:** age over 65 years, unstable angina pectoris, recent MI (less than 30 days), changes in ECG making it difficult to interpret the QRS complex and ST segment, atrial fibrillation and other serious cardiac arrhythmias, decreased LVEF (< 40%), pulmonary hypertension, respiratory and renal failure, metabolic (obesity, decompensated diabetes mellitus) and concomitant diseases that prevent exercise **N randomised:** total: 114; intervention 1 (cycling): 36; intervention 2 (walking): 36; comparator: 42 **Diagnosis (% of participants):** CABG (100%) **Age (median, IQR):** intervention 1 (cycling): 57, 51-59; intervention: 56, 51-57; comparator: 56 (51-57) **Percentage male:** 100% **Ethnicity (white %):** NR
Interventions	**Intervention:** Group 1: controlled aerobic exercise carried out on a stationary bike Group 2: independent dosed walking at home, with training pace controlled by pedometer **Components:** Exercise only **Setting:** group 1 - hospital-based; group 2 - home-based **Exercise programme modality:** group 1 - cycling; group 2 - walking **Length of session:** 30 minutes **Frequency:** group 1: 3 sessions per week; group 2: at least 3 times per week **Intensity:** group 1: 50% to 75% peak heart rate; group 2: walking pace determined by calculation using cycle ergometry test, target heart rate 50% to 75% peak **Resistance training included?** No **Total duration:** 3 months **Co-interventions:** None described **Comparator:** Medication plus monthly telephone follow-up **Co-interventions:** None described
Outcomes	HRQoL (results not reported)
Source of funding	Not reported
Conflicts of interest	None declared
Notes	Paper translated from Russian. Authors contacted to request HRQoL data, but no response received

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	By simple randomisation using a table of random numbers
Allocation concealment (selection bias)	Unclear risk	No information provided

Pomeshkina 2017 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Number randomised and reported in final outcomes the same, appears to be no dropouts
Selective reporting (reporting bias)	High risk	Methods state that at each time point, participants underwent clinical examination, echocardiography, quality of life assessment and determination of exercise tolerance, but these results are not reported.

Pomeshkina 2019

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Russia **Dates participants recruited:** January 2015 - December 2016 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: participants with coronary artery disease who underwent CABG with the presence of arterial erectile dysfunction **Exclusion criteria:** confirmed endocrine causes of erectile dysfunction, acquired primary hypogonadism, anatomical deformities of the external genital organs, drug-related decrease in secretion testosterone, cancer, history of stroke, radical interventions on the pelvic organs, decompensated somatic diseases, low (< 50 W) exercise tolerance (TFN), arterial hypertension with diastolic blood pressure above 100 mmHg, recent myocardial infarction (< 28 days), complex rhythm and conduction disturbances (paroxysmal tachycardia, atrial fibrillation, polytopic and group ventricular extrasystoles, atrioventricular blockade (II-III degree), chronic heart failure (class III, IV), subacute course of chronic non-specific lung diseases, postoperative thrombophlebitis of the lower extremities, diabetes mellitus, a variety of neurological disorders that could interfere with cycling. **N randomised:** total: 114; intervention: 53; comparator: 61 **Diagnosis (% of participants):** CABG (100%) **Age (mean, SD):** intervention: 56.9 ± 4.7; comparator: 57.1 ± 4.8 **Percentage male:** 100% **Ethnicity (white %):** NR
Interventions	**Intervention:** controlled physical training in the form of cycling training **Components:** exercise only **Setting:** centre-based **Exercise programme modality:** cycling **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** No **Total duration:** NR

Pomeshkina 2019 *(Continued)*

	Co-interventions: none described **Comparator:** no physical training **Co-interventions:** none described
Outcomes	Methods states: myocardial infarction (MI), episodes of unstable angina pectoris, ischaemic stroke, lethal outcomes. But these are not reported in the results.
Source of funding	Not reported
Conflicts of interest	None declared
Notes	Paper translated from Russian. Authors contacted to request clinical outcome data, but no response received

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information about methods used to generate allocation sequence
Allocation concealment (selection bias)	Unclear risk	No information about methods used to conceal allocation sequence
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided about blinding of outcome assessors
Incomplete outcome data (attrition bias) All outcomes	Low risk	Appears to be no missing outcome data
Selective reporting (reporting bias)	High risk	Methods report collection of myocardial infarction (MI), episodes of unstable angina pectoris, ischaemic stroke, lethal outcome data, but these are not reported in results section

Prabhakaran 2020

Study characteristics

Methods	**Study design:** multicentre RCT (24 sites) **Country:** India **Dates participants recruited:** August 2014 - March 2018 **Maximum follow-up:** median follow-up 21.6 months
Participants	**Inclusion criteria**: participants aged 18 to 80 years with acute myocardial infarction within the past 14 days were eligible if they were willing and able to complete the hospital-based CR programme. Acute MI confirmed by the WHO definition (presence of symptoms of ischaemia and changes in ECG) or the Third Universal definition of MI (elevation of a cardiac biomarker along with the presence of other symptoms of MI or changes in ECG).

Prabhakaran 2020 *(Continued)*

	Exclusion criteria: participants who practised yoga regularly (i.e. > 3hr per week) or were participating in other clinical trials. Those with diseases that limited their life span to < 1 year or considered unlikely to complete the study by the local investigator. **N randomised:** total: 3959; intervention: 1970; comparator: 1989 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 53.4 ± 11; comparator: 53.4 ± 10.8 **Percentage male:** intervention: 86.2%; comparator: 85.9% **Ethnicity:** NR
Interventions	**Intervention:** Yoga-care program. 13 direct contact sessions over 12 weeks. First two sessions delivered individually and the remainder in groups at the hospital. Group sessions lasted ~75 minutes and involved a combination of exercises related to general physical conditioning, stress and relaxation (health rejuvenating exercises - around 10 min, yoga poses - 25 min, breathing exercises - 15 min, meditation and relaxation practices - 15 min; and moderated discussion - 10 min), and some exercises believed to be of particular cardio-protective benefit in yogic texts. The lifestyle and other educational components were informed by yogic ideas but moderated by established scientific evidence. Sessions led by yoga teachers trained in delivery of yoga-care program. Participants were also encouraged to practice daily at home following the instructions provided in a DVD and booklet. **Components:** exercise and education **Setting:** centre-based **Exercise programme modality:** yoga **Length of session:** 75 min **Frequency:** at least once a week **Intensity:** not reported **Resistance training included?** No **Total duration:** 12 weeks **Co-interventions:** None described **Comparator:** Enhanced standard care in the form of educational advice leaflets (once before discharge, at 5 and 12 weeks) along with standard medical care as elsewhere in India but does not include rehabilitation. **Co-interventions:** none described
Outcomes	Mortality, MI, hospitalisations, HRQoL (only at 12 weeks), cost effectiveness
Source of funding	Indian Council of Medical Research and the Medical Research Council, United Kingdom
Conflicts of interest	Dr. Chathurvedi has served as a member of the Data Safety and Monitoring Committee for AstraZeneca. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Block randomization, stratified by centers, age (<60 or $60 years), and sex, was carried out by a central computer program"

Prabhakaran 2020 *(Continued)*

Allocation concealment (selection bias)	Low risk	"...central computer program using an interactive Web response system"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Events were adjudicated by an independent committee unaware of trial-group assignments, using standard definitions specified in the protocol." Patient-reported outcomes/quality of life not blinded.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intervention 61/1979 (3%), Control 49/1989 (2%) participants lost to follow-up are low in number and < 20%, similar across groups and for similar reasons. Protocol paper states that sensitivity analyses and multiple imputation would be performed, but these are not reported in the main publication.
Selective reporting (reporting bias)	Low risk	Protocol paper available. Prespecified economic analyses are not reported in the main report – authors confirmed this will be a separate publication. QoL data at later follow-up time points also to be included in a later publication.

Reid 2012

Study characteristics	
Methods	**Study design:** multicentre RCT (2 sites) **Country:** Canada **Dates participants recruited:** December 2004 to December 2007 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: Admitted for acute coronary syndromes who: underwent successful percutaneous coronary revascularisation; were not planning on enrolling in CR; had Internet access at home or work; and were 20 to 80 years of age. **Exclusion criteria:** CABG; implantable cardioverter-defibrillator; NYHA Class III or IV heart failure; inability to speak and read English. **N randomised:** total: 223 ; intervention: 115; comparator: 108 **Diagnosis (% of participants):** AMI this admission: 29.1% PCI this admission: 98.2% First cardiac event: 64.6% Previous AMI: 18.8% Previous PCI: 27.4% Previous CABG: 9.0% **Age (mean ±SD):** intervention: 56.7 ± 9.0; comparator: 56.0 ± 9.0 **Percentage male:** intervention: 82.6%; comparator: 86.1% **Ethnicity:** NR
Interventions	**Intervention:** Participants were visited in hospital by an exercise specialist, who presented a personally tailored physical activity plan and instructions on how to access the CardioFit website. Following discharge, participants were asked to log their daily activity on the CardioFit website and complete a series of five online tutorials (at weeks 2, 4, 8, 14, and 20). Following each tutorial, a new physical activity plan was developed. Between tutorials, participants received emails from the exercise specialist providing motivational feedback on their progress.

Reid 2012 *(Continued)*

	Components: exercise plus psychological support **Setting:** home **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 20 weeks **Co-interventions:** the CardioFit website and tutorials were designed to foster behavioural capability, self-efficacy, social support, and realistic outcome expectations. Tutorials were organised to engage self-control processes including exercise planning, goal setting, monitoring and self-regulation, and relapse prevention. **Comparator:** physical activity guidance from their attending cardiologist and an education booklet. **Co-interventions:** none described
Outcomes	HRQoL
Source of funding	Heart and Stroke Foundation of Ontario. Dr Reid was supported by a New Investigator Award from the Heart and Stroke Foundation of Canada. Dr Blanchard is supported by the Canada Research Chairs programme.
Conflicts of interest	"The authors declare that there is no conflict of interests"
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Participants were randomized ... using a random sequence that was computer generated by a statistical consultant in blocks of 4, 8, and 10."
Allocation concealment (selection bias)	Low risk	"Sequences were generated for Ottawa and London and placed in sealed, numbered envelopes to ensure that treatment allocation was concealed until after baseline data collection. Research coordinators allocated the next available number on study entry (while the participant was still hospitalized)"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Research assistants, blinded to the participants' treatment allocation, conducted follow-up assessments"
Incomplete outcome data (attrition bias) All outcomes	High risk	Loss to follow-up was well reported but was high in both groups 36/115 [31%] and 33/108 [31%] were lost to follow-up from the intervention and control groups.
Selective reporting (reporting bias)	Low risk	All outcomes described in the methods section are reported in results.

Roman 1983

Study characteristics

Roman 1983 *(Continued)*

Methods	**Study design:** single-centre RCT **Country:** Chile **Dates participants recruited:** June 1973 to June 1981 **Maximum follow-up:** 9 years
Participants	**Inclusion criteria**: participants with transmural AMI **Exclusion criteria:** severe arrhythmias persisting after the acute phase of AMI (frequent ventricular premature beats, grade iii-iv of the Lown classification, atrial flutter, partial or complete AV block); great left-ventricular enlargement; left ventricular aneurysm; persistent cardiac failure; severe diastolic hypertension post-myocardial infarction angina. **N randomised:** total: 193; intervention: 93; comparator: 100 **Diagnosis (% of participants):** Transmural AMI: 100% Anterior wall infarction: 55% Posteroinferior infarction: 45% **Age (mean ± SD):** intervention: 56.2 ± 10.3; comparator: 59.1 ± 8.8 **Percentage male:** intervention: 93.6%; comparator: 87% **Ethnicity:** NR
Interventions	**Intervention:** Supervised physical training programme according to the guidelines reported by Zohman and Tobias. It was started with combined ergometric, callisthenic and walk-jogging exercise lasting 30 min, three times a week. The intensity of the training was graded according to the target heart rate threshold, defined as 70% of maximal heart rate achieved by the participant in the former ergometric work test. **Components:** exercise only **Setting:** centre **Exercise programme modality:** combined ergometric and walk-jogging exercise **Length of session:** 30 min **Frequency:** three times a week **Intensity:** 70% of maximal heart rate **Resistance training included?** Callisthenics **Total duration:** average 42 months (range 6 to 108 months) **Co-interventions:** none described **Comparator:** Control participants were medically treated according to the guidelines commonly used; namely, short- and long-lasting nitrites, ß- blockers or Ca antagonists (nifedipine). **Co-interventions:** A small number (8 participants) were also treated with oral anticoagulants.
Outcomes	Mortality, MI and revascularisations
Source of funding	NR
Conflicts of interest	NR
Notes	

Roman 1983 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients were randomly allocated…"
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	Low risk	18/93 (19.4%) and 18/100 (18%) withdrew or dropped out from intervention and control groups over the 9-year period.
Selective reporting (reporting bias)	Low risk	Mortality, morbidity and complications were recorded over the duration of the study and are presented as rates.

Sandström 2005

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** NR (recruited over a period of 2½ years) **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: participants > 65 years admitted following an acute coronary event. Participants had to perform a pre-discharge exercise test with a workload of ≥ 70 watts in men and ≥ 50 watts in women. **Exclusion criteria:** participants with neurological sequelae, memory dysfunction such as dementia, orthopaedic disability, inability to speak or understand Swedish, or both, and a planned coronary intervention within 3 months. **N randomised:** total: 101; intervention: 50; comparator: 51 **Diagnosis (% of participants):** Angina pectoris: intervention: 20%; comparator: 21% Previous AMI: intervention: 18%; comparator: 11% Acute coronary event: intervention: 50%; comparator: 51% Previous PCI: intervention: 7%; comparator: 5% Previous CABG: intervention: 9%; comparator: 9% (Not mutually exclusive numbers.) **Age (median):** total: 71 years (range 64-84); intervention: 71 years (range 64-84); comparator: 71 years (range 65-83)

Sandström 2005 *(Continued)*

	Percentage male: total 80.2%; intervention: 82%; comparator: 78.4% **Ethnicity:** NR
Interventions	**Intervention:** 50 min aerobic group training programme three times a week for 3 months, with a voluntary 50 min step-down period once a week for another 3 months. The complete programme was supported by music, which guided the intensity of the performance during the session. The training sessions were followed by 10 min of relaxation, also supported by music. **Components:** exercise only **Setting:** centre-based supervised group sessions **Exercise programme modality:** aerobic exercises to music **Length of session:** 50 min with a voluntary 50 min step-down period once a week for another 3 months **Frequency:** 3 times a week **Intensity:** NR **Resistance training included?** No **Total duration:** 3 months **Co-interventions:** none described **Comparator:** participants were recommended to take a daily walk at a comfortable speed, and to gradually increase the time, length and speed, and were encouraged to restart their prior physical activity as soon as they felt fit enough for this. **Co-interventions:** none described
Outcomes	HRQoL and revascularisation
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"….were randomly allocated into one of two groups:"
Allocation concealment (selection bias)	Unclear risk	Allocation concealment was not described.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"patients were evaluated ….. by an independent, blinded to group allocation, researcher."
Incomplete outcome data (attrition bias) All outcomes	Low risk	There was no attrition - data were reported for all participants randomised.
Selective reporting (reporting bias)	Low risk	All outcomes mentioned in methods were reported at all time points.

Santaularia 2017

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Spain **Dates participants recruited:** June 2010 - June 2012 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: Age over 18 years, diagnosis of myocardial ischaemia (MI pre-infarct angina, angina pectoris, other specific forms of chronic ischaemic heart disease or unspecified ischaemic heart disease) during the current admission, residence in the catchment area of the hospital, absence of cognitive deficit (Pfeiffer test: 0-2 mistakes), sufficient functional capacity to follow the CRP (Barthel index > 60), and willingness to participate in the study and provide signed informed consent. **Exclusion criteria:** Symptoms of right heart failure producing pulmonary hypertension or dyspnoea caused by severe pulmonary pathology, additional comorbidities affecting the prognosis of cardiac disease, major comorbidities or limitations that could interfere with the exercise training programme. **N randomised:** total: 86; intervention: 42; comparator: 44 **Diagnosis (% of participants):** intervention: myocardial ischaemia (85.4%), pre-infarct angina (4.9%), cardiac angina (9.8%); comparator: myocardial ischaemia (72.7%), pre-infarct angina (13.6%), cardiac angina (11.4%), other specific forms of chronic ischaemic heart disease (2.3%). **Age (mean ± SD):** intervention: 59.4 ± 12; comparator: 59.7 ± 10.4 **Percentage male:** intervention: 93%; comparator: 77% **Ethnicity:** NR
Interventions	**Intervention:** Supervised outpatient exercise training programme based on the results of the exercise stress test and mindful of comorbid conditions and physical limitations. Intervention started within 3 days of exercise test which was performed within 1 month of discharge. Hospital-based programme of physiotherapist-supervised exercise (3 hours/week spread over 3 days), for 10 weeks. Classes consisted of 10 minutes of warm-up and muscle stretching, 30 minutes of aerobic exercises on a cycle ergometer, 15 minutes of isotonic exercises for the upper and lower limbs and 5 minutes of cool-down. Aerobic exercise intensity was between 75% and 90% of the maximum heart rate obtained in the previous exercise stress test and progressed according to the perceived exertion rate score of 11–15. Resistance training was performed with 10–15 repetitions for three sets, maintaining a perceived exertion rate score of 11–14. **Components:** exercise only **Setting:** centre-based **Exercise programme modality:** cycle ergometry **Length of session:** 1 hour **Frequency:** 3 sessions per week **Intensity:** 75-90% peak heart rate, RPE 11-15 **Resistance training included?** Yes – upper and lower limb isotonic exercises, 10-15 repetitions, 3 sets, RPE 11-14 **Total duration:** 10 weeks **Co-interventions:** None described **Comparator:** Standard care, given oral and written information about cardiovascular risk factors during hospitalisation. Participants instructed to do exercises to regain mobility and maintain muscle tone and peripheral circulation and taught breathing exercises. Participants provided guidance on how to return to physical activity. Scheduled for follow-up visits at 3, 6 and 12 months post discharge to control risk factors, reinforce education measures and review adherence to cardiac medication.

Santaularia 2017 *(Continued)*

	Co-interventions: none described
Outcomes	Mortality, hospitalisations, HRQoL
Source of funding	Supported by a grant from the Collegi de Fisioterapeutes de Catalunya (no.: R01/08-09)
Conflicts of interest	None declared
Notes	Authors contacted to obtain appendices as they were not available online

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"A randomisation list in blocks of 10 was created by a computer random number generator."
Allocation concealment (selection bias)	Unclear risk	"The randomisation list and allocation of patients to each group were independently controlled by the Clinical Research Unit"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The endpoint committee who assessed the primary outcomes was blinded regarding group assignment." Appears that HRQoL assessment was not blinded.
Incomplete outcome data (attrition bias) All outcomes	Low risk	< 20% missing outcome data and reasons provided
Selective reporting (reporting bias)	Low risk	Published protocol paper available; all outcomes reported

Schuler 1992

Study characteristics

Methods	**Study design:** single-centre RCT. Participants randomised after routine angiography for angina. **Country:** Germany **Dates participants recruited:** NR **Maximum follow-up:** 6 years
Participants	**Inclusion criteria**: Male, stable symptoms, willingness to participate in the study for at least 12 months, coronary artery stenoses well documented by angiography, and permanent residence within 25 km of the training facilities at Heidelberg. **Exclusion criteria:** Unstable angina pectoris, left main coronary artery stenosis > 25% luminal diameter reduction, severely depressed left ventricular function (ejection fraction < 35%), significant valvular heart disease, insulin-dependent diabetes mellitus, primary hypercholesterolaemia (type II hyperlipoproteinaemia, low density lipoprotein [LDL] > 210 mg/dL), and occupational, orthopedic, and other conditions precluding regular participation in exercise sessions. **N randomised:** total: 113; intervention: 56; comparator: 57 **Diagnosis (% of participants):** AMI: 66% **Age (mean ± SD):** intervention: 52.8 ± 5.8; comparator: 54.2 ± 7.7

Schuler 1992 *(Continued)*

	Percentage male: 100% **Ethnicity:** NR
Interventions	**Intervention:** participants stayed on a metabolic ward during the initial 3 weeks, during which they were instructed how to lower the fat content of their regular diet. Participants were asked to exercise daily at home on a cycle ergometer for a minimum of 30 minutes close to their target heart rates, which were determined as 75% of the maximal heart rate during symptom-limited exercise. In addition, they were expected to participate in at least two group training sessions of 60 minutes each week. **Components:** exercise and education. **Setting:** centre (group session) and unsupervised at home. **Exercise programme modality:** cycle ergometer. **Length of session:** 30 min at home and 60 min group session. **Frequency:** daily at home; twice a week at centre. **Intensity:** 75% maximal HR. **Resistance training included?** No. **Total duration:** 12 months. **Co-interventions:** participants were on their regular antianginal medication, including β-blocking agents. **Comparator:** participants spent 1 week on the metabolic ward, where they received identical instructions about the necessity of regular physical exercise and how to lower fat consumption. "Usual care" was rendered by their private physicians. **Co-interventions:** They were asked not to take lipid-lowering medications.
Outcomes	Total and CHD mortality, non-fatal MI, revascularisation.
Source of funding	Bundesministerium für Forschung und Technologie, Bonn, FRG.
Conflicts of interest	NR
Notes	Exercise adherence in the first year was 68% (39% to 92%), over the next 5 years 33% (3% to 89%). Participants with regression of coronary atheroma attended exercise sessions significantly more often (54 +/- 24%) than participants with no change (20 +/- 24%) or progression 31 +/- 20%).

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Low risk	"sealed envelopes"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Evaluation of coronary angiograms was performed by two technicians blinded to the sequence of films and the patient's identity or group assignment."
Incomplete outcome data (attrition bias) All outcomes	High risk	20% lost to follow-up; no description of withdrawals or dropouts.

Schuler 1992 *(Continued)*

Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Seki 2003

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Japan **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: Male participants; > 65 years of age; with chronic CAD; referred at least 6 months after a major coronary event, including acute MI, coronary artery bypass grafting or percutaneous balloon angioplasty for acute coronary syndrome. **Exclusion criteria:** none described. **N randomised:** total: 38; intervention: 20; comparator: 18 **Diagnosis (% of participants):** Chronic CAD: 100% MI: 55% PCI: 39% CABG: 39% **Age (mean ± SD):** intervention: 69.3±2.9 ; comparator: 70.1±3.7 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** participants participated in an outpatient phase III CR program for 6 months. The weekly supervised exercise session at the clinic consisted of approximately 20 min of warm-up exercises including stretching and callisthenics, followed by 20–30 min of continuous upright aerobic and dynamic exercise (various combinations of walking, bicycling, jogging, and other activities) and light isometric exercise, such as hand weights, and approximately 20 min of cool-down stretching and callisthenics. The intensity of exercise was prescribed individually at the anaerobic threshold level measured by a symptom-limited treadmill exercise test at baseline. In addition to the supervised exercise session, participants were encouraged to exercise twice a week outside of the clinic. Each participant's exercise prescription was also periodically adjusted on the basis of repeated treadmill exercise test to encourage a gradual increase in overall exercise performance. **Components:** exercise and education. **Setting:** supervised in a centre and independent at home. **Exercise programme modality:** e.g. walking, bicycling, jogging. **Length of session:** 60-70 min. **Frequency:** weekly at centre plus twice a week at home. **Intensity:** prescribed individually. **Resistance training included?** Callisthenics. **Total duration:** 6 months.

Seki 2003 *(Continued)*

	Co-interventions: participants were encouraged and interviewed at the supervised exercise session by physicians, dietitians, nurses, and exercise physiologists to comply with both the exercise and dietary education of the programme throughout its duration. **Comparator:** participants were followed by an individual physician as a usual outpatient. **Co-interventions:** none described.
Outcomes	Health-related quality of life at 6 months.
Source of funding	Health Sciences Research Grants from Ministry of Health and Welfare (Comprehensive Research on Aging and Health).
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomly assigned..by envelope method"
Allocation concealment (selection bias)	Unclear risk	"randomly assigned..by envelope method"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	All 38 participants accounted for.
Selective reporting (reporting bias)	Low risk	All outcomes are reported for all time points.

Seki 2008

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Japan **Dates participants recruited:** NR **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: > 65 years old with stable CAD **Exclusion criteria:** Ongoing congestive heart failure, liver dysfunction, renal dysfunction, or systemic diseases, including malignancy and collagen disease. **N randomised:** total: 39; intervention: 20; comparator: 19 **Diagnosis (% of participants):**

Seki 2008 *(Continued)*

	stable CAD: 100% MI: 46% PCI: 31% CABG: 36% **Age (mean ± SD):** intervention: 69±3 ; comparator:70±4 **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** Weekly outpatient phase III cardiac rehabilitation programme that included an exercise session, exercise prescription, dietary instruction and an educational programme for 6 months. Supervised exercise sessions at the clinic consisted of approximately 15 min of warm-up exercises including stretching, followed by 20 to 60 min of continuous upright aerobic exercise and light isotonic exercise such as sit-ups and squatting using the participant's own body weight, followed by approximately 15 min of cool-down stretching and callisthenics. The intensity of exercise was prescribed individually at the anaerobic threshold (AT) level as measured by a treadmill exercise test using expiratory gas analysis or a rating of 12 to 13 on the standard Borg perceived exertion scale. In addition to the weekly supervised exercise sessions, participants were encouraged to perform aerobic exercise twice weekly (≥ 30 min) at home at an intensity of heart rate of AT or a rating of 12 to 13 on the Borg scale. **Components:** exercise and education. **Setting:** centre and home. **Exercise programme modality:** e.g. walking, bicycling, jogging. **Length of session:** 50 to 110 min at the centre; ≥ 30 min at home. **Frequency:** weekly at the centre plus twice a week at home. **Intensity:** 12 to 13 on the standard Borg scale. **Resistance training included?** Callisthenics. **Total duration:** 6 months. **Co-interventions:** participants were instructed about the phase II diet of the American Heart Association at the beginning and every 2 months of the study. An educational programme was also given to each subject by physicians and nurses regarding ischaemic heart disease and risk factors at baseline. Subjects were frequently encouraged by physicians, dietician, nurses, and exercise physiologists to comply with both exercise and dietary instructions throughout the programme. Standard medical care was provided for both groups. Lipid-lowering drugs and other medications that may affect lipid levels were given at stable doses for at least 4 weeks before entry, and the doses of these medications were not altered during the study period. **Comparator:** usual outpatient care. **Co-interventions:** none described.
Outcomes	Total mortality; non-fatal/fatal mortality.
Source of funding	Health Sciences Research Grants from Ministry of Health, Labour and Welfare (Comprehensive Research on Aging and Health).
Conflicts of interest	NR
Notes	"No subject in either group showed any worsening of symptoms or had clinical events during this study."

Risk of bias

Bias	Authors' judgement	Support for judgement

Seki 2008 *(Continued)*

Random sequence generation (selection bias)	Unclear risk	"randomly assigned"
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No information reported.
Selective reporting (reporting bias)	Low risk	All outcomes were reported for all time points.

Shaw 1981

Study characteristics	
Methods	**Study design:** Multicentre RCT (5 sites) **Country:** USA **Dates participants recruited:** 1976 **Maximum follow-up:** 5 years Participants were randomised after completion of a 6-week, low-level exercise programme run-in period.
Participants	**Inclusion criteria**: documented MI ≥ 8 weeks but ≤ 3 years before being enrolled. Other eligibility criteria included the ability to exercise at an intensity level ≥ 3 metabolic equivalents (METs) and a supine resting diastolic blood pressure < 100 mmHg. **Exclusion criteria:** participants were considered ineligible if they had any other significant coexisting CVD or other disease likely to be fatal in the near future, uncontrolled diabetes mellitus, complete heart block with or without ventricular pacemaker, or emotional or physical impairments that would make participation and adherence difficult, or if they were already participants in a formal exercise programme. **N randomised:** total:651; intervention: 323; comparator: 328 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 51.5 ± 7.4; comparator: 52.1 ± 7.2 **Percentage male:** 100% **Ethnicity % white:** intervention: 93.3%; comparator: 94.4%
Interventions	**Intervention:** An exercise prescription was developed on the basis of each participant's multistage graded exercise test (MSET) results. An exercise target heart rate guided the prescription and was determined as 85% of the peak heart rate achieved on the test. This group performed brisk physical activity in the laboratory for 8 weeks, exercising 1 hour per day, 3 days per week. The participants were supervised and underwent continuous ECG monitoring. Each individual exercised for 4 minutes on each of 6 stationary machines with a 2-minute rest interval between machines. Attainment of the target heart rate was the goal for every 4-minute exercise period.

Shaw 1981 *(Continued)*

	After 8 weeks, participants exercised in a gymnasium or swimming pool without ECG monitoring, although exercise heart rates were periodically checked. Activities consisted of 15 minutes of continuous jogging, cycling, or swimming, followed by 25 minutes of recreational games. The activities were performed at an intensity level enabling each participant to reach his individually prescribed target heart rate. The men were encouraged to attend 3 sessions per week but in some situations were allowed to exercise on their own. **Components:** exercise only. **Setting:** group sessions in centre ("but in some situations were allowed to exercise on their own"). **Exercise programme modality:** "brisk physical activity" on "stationary machines". **Length of session:** 40 min. **Frequency:** 3 days per week. **Intensity:** 85% of the peak heart rate. **Resistance training included?** No **Total duration:** 8 weeks in the laboratory, followed by regular jogging, cycling, or swimming and recreational games. **Co-interventions:** none described. **Comparator:** Participants in the non-exercising control group were encouraged to maintain normal routines but not to participate in any regular exercise programme. **Co-interventions:** none described.
Outcomes	Total & CHD mortality, non-fatal MI.
Source of funding	National Heart, Lung, and Blood Institute.
Conflicts of interest	NR
Notes	90% of ET attended 90% of 24 scheduled sessions post-randomisation, only 48% attending > 50% of sessions at 18 months. 30% of control alleged exercising regularly, on own initiative. At 19 years any protective effect from the programme had decreased over time, but an increase with PWC from the beginning to the end of the trial was associated with a consistent reduction in mortality throughout the 19 years of follow-up.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Sequence generation not described…."the men were randomly assigned."
Allocation concealment (selection bias)	Unclear risk	Allocation concealment not described.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	6.5% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points.

Sivarajan 1982

Study characteristics	
Methods	**Study design:** Multicentre RCT (7 sites) **Country:** USA **Dates participants recruited:** 1 September 1977 to 2 December 1979 **Maximum follow-up:** 6 months Random allocation of individuals to two intervention groups (exercise only (Intervention B1) or exercise plus teaching and counselling (Intervention B2)) and a control group (usual care).
Participants	**Inclusion criteria**: Previous MI, age < 70 years, living < 50 miles of centre. **Exclusion criteria:** prolonged complications, physical limitations, noncardiac or cardiac diseases, communication problems, other issues e.g. massive obesity, psychological problems, etc. **N randomised:** total: 258; Intervention B1: 88; Intervention B2: 86; comparator: 84 **Diagnosis (% of participants):** AMI: 100% **Age (mean ±SD):** Intervention B1: 55.6 ± 9.3; Intervention B2: 56.3 ± 8.3; comparator = 57.1 +/- 7.3 **Percentage male:** > 80% **Ethnicity:** > 80% white
Interventions	**Intervention:** The outpatient exercise programme was identical for the participants in groups Bl and B2. It consisted of a gradually progressive callisthenic and walking programme prescribed at weekly 30-minute clinic visits and performed by the participant at home. Participants were instructed to exercise twice a day until they returned to work and once a day thereafter. If the participant was symptom free, the prescription was gradually increased to add callisthenics of increasing intensity and the distance and time (or rate) of walking were gradually advanced. **Components:** exercise only or exercise plus education and counselling. **Setting:** centre and home. **Exercise programme modality:** walking. **Length of session:** NR **Frequency:** twice a day until return to work and once a day thereafter. **Intensity:** NR **Resistance training included?** callisthenics. **Total duration:** NR **Co-interventions:** participants in group B2, in addition to receiving exercise prescriptions as described above, attended a series of eight 1-hour group sessions during weekly clinic visits. The sessions emphasised the practical aspects of anatomy and physiology of the heart, coronary artery disease, myocardial infarction and medications; risk factors, including smoking, hypercholesterolaemia, hypertension, stress and sedentary living; nutritional aspects of fats, cholesterol, salt and alcohol; activities and exercises; emotional reactions to myocardial infarction in participants and their families; resumption of sexual activity; and issues concerning return to work or, if retired, to an alternative, meaningful lifestyle. **Comparator:** conventional medical and nursing management throughout all phases of hospitalisation and convalescence at home. **Co-interventions:** none described.

Sivarajan 1982 *(Continued)*

Outcomes	Total mortality; health-related quality of life: Sickness Impact Profile.
Source of funding	Bureau of Health Professions, Division of Nursing, Department of Health and Human Services.
Conflicts of interest	NR
Notes	Several reports of the same trial all with various bits of information. Study authors conclude that multiple intervention trial of this short duration did not change participants' behaviour. MI itself acts as a strong stimulus to alter behaviour with respect to risk factors.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	24% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Snoek 2020

Study characteristics

Methods	**Study design:** Multicentre RCT (6 sites across 5 countries) **Country:** Europe (the Netherlands, Denmark, Spain, Switzerland, France) **Dates participants recruited:** November 2015 - January 2018 **Maximum follow-up:** 12 months
Participants	**Inclusion criteria:** Participants of 65 years or older who are a candidate for CR and non-voluntary to participate in the regular CR programme Signed written informed consent One of the following criteria: • participants with an acute coronary syndrome, including myocardial infarction (MI) and/or revascularisation within 3 months prior to the start of the CR program • participants that underwent a percutaneous coronary intervention (PCI) within 3 months prior to the start of the CR programme

Snoek 2020 *(Continued)*

	• participants that received coronary artery bypass grafting (CABG) within 3 months prior to the start of the CR programme • participants who were treated surgically or percutaneously for valvular heart disease (including TAVI) within 3 months prior to the start of the CR programme • participants with a stable angina with documented significant CAD (defined by standard non-invasive or invasive methods **Exclusion criteria:** • Contraindication to CR • Mental impairment leading to inability to cooperate • Severe impaired ability to exercise • Signs of severe cardiac ischaemia and/or a positive exercise testing on severe cardiac ischaemia • Insufficient knowledge of the native language • No access, availability or insufficient knowledge of a computer with internet • Implanted cardiac device (pacemaker, ICD) **N randomised:** total: 179; intervention: 89; comparator: 90. **Diagnosis (% of participants):** PCI: intervention 63 (71%); control 65 (72%) CABG: intervention 11 (12%); control 8 (9%) Valve replacement: intervention 1 (1%); control 3 (3%) None: intervention 14 (16%); control 14 (16%) **Age (mean ±SD):** intervention: 72.4 ± 5.4; comparator 73.6 ± 5.5 **Percentage male:** intervention: 78%, comparator: 84% **Ethnicity:** intervention: 99%, comparator: 99% white
Interventions	**Intervention:** 6-month home-based CR program equipped with a smartphone and heart rate belt. Participants instructed to exercise at moderate intensity for at least 30 minutes per day, 5 days per week. Motivational interviewing was applied by telephone weekly in the first month, every other week in the second month, and monthly until completion of the program at 6 months **Setting:** Home-based **Exercise programme modality:** Self-chosen type of activity **Length of session:** > 30 minutes **Frequency:** five sessions per week. **Intensity:** self-selected level of intensity (guided by RPE and heart rate zones) **Resistance training included?** NR **Total duration:** 6 months. **Co-interventions:** none described **Comparator:** participants in the control group did not receive any form of cardiac rehabilitation but received locally defined standard of care. **Co-interventions:** none described.
Outcomes	Mortality, MI, PCI, cardiovascular hospitalisation, HRQoL
Source of funding	Study was supported by grant 634439 from the European Union's Horizon 2020 Research and Innovation Programme and contract 15.0139 from the Swiss State Secretariat for Education, Research and Innovation

Snoek 2020 *(Continued)*

Conflicts of interest	Mr Snoek reported receiving grants from European Union's Horizon 2020 Research and Innovation Programme during the conduct of the study. Dr van der Velde reported receiving grants from the European Union during the conduct of the study. Dr Eijsvogels reported receiving a personal grant from the Dutch Heart Foundation. Dr Prins reported receiving grants from the European Commission during the conduct of the study and outside the submitted work. Dr Bruins reported receiving grants from Isala Heart Centre during the conduct of the study. Dr Meindersma reported receiving grants from the European Commission during the conduct of the study. Dr Peña-Gil reported receiving grants from European Commission during the conduct of the study. Dr González-Salvado reported receiving grants from the European Union during the conduct of the study. Dr Iliou reported receiving personal fees and non-financial support from Servier Laboratories, non-financial support from Novartis International AG and Sanofi SA, and personal fees from AstraZeneca outside the submitted work. Dr Marcin reported receiving grants from the Swiss National Fond during the conduct of the study. Dr Van't Hof reported receiving grants from the European Union during the conduct of the study and grants from Medtronic plc, AstraZeneca, and Abbott Laboratories outside the submitted work. Dr de Kluiver reported receiving grants from the European Union during the conduct of the study and having an indirect interest in HC@home/Mobihealth, which provided the hardware and software for this study, outside the submitted work. No other disclosures were reported.
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Randomization was performed in fixed blocks of 4, stratified by center, with a 1:1 ratio to the intervention group (MCR) or a control group without cardiac rehabilitation using a centralized computerized allocation system."
Allocation concealment (selection bias)	Low risk	"Randomization was performed in fixed blocks of 4, stratified by center, with a 1:1 ratio to the intervention group (MCR) or a control group without cardiac rehabilitation using a centralized computerized allocation system."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"Researchers assessing primary outcomes were blinded for group assignment."
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intervention group: 16/89 (18%) lost to follow-up Control group: 12/90 (13%) lost to follow-up
Selective reporting (reporting bias)	Low risk	Trial protocol provided as supplementary file in main publication; outcomes reported in protocol are reported at 6 and 12 months in the results. Costs mentioned in the protocol but likely to be in a future publication.

Specchia 1996

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Italy **Dates participants recruited:** NR (40-month period) **Maximum follow-up:** mean 34.5 months

Specchia 1996 *(Continued)*

Participants	**Inclusion criteria**: participants < 65 years of age who had not had previous MI, admitted due to chest pain lasting > 30 minutes and because they had a diagnosis of AMI based on evolutionary ECG changes and serum kinase elevation. **Exclusion criteria:** complicated in-hospital clinical course e.g. post-infarction angina requiring urgent revascularisation; evidence of congestive HF; chronic concomitant illnesses or musculoskeletal handicaps that would prevent them from finishing the exercise training period. **N randomised:** total: 256; intervention: 125; comparator: 131 **Diagnosis (% of participants):** MI: 100% Prior angina: 42% **Age (Mean ± SD):** intervention: 51.5 ± 7; comparator: 54.3 ± 8 **Percentage male:** 91% intervention: 91%; comparator: 91% **Ethnicity:** NR
Interventions	**Intervention:** participants underwent a 4-week physical training period consisting of supervised training sessions of 30 minutes of bicycle ergometry five times a week combined with callisthenics. Training intensity was graded according to 75% of maximal work capacity reached in the previous exercise test. At the end of the 4-week training period, a second symptom-limited exercise test was performed. Participants were then discharged with the instructions to continue the callisthenics daily and to walk for ≥ 30 minutes every 2 days. **Components:** exercise, education and psychology. **Setting:** centre and then home. **Exercise programme modality:** bicycle ergometry in centre followed by callisthenics and walking at home. **Length of session:** ≥ 30 minutes. **Frequency:** five times a week in centre followed by daily callisthenics and walking every other day. **Intensity:** 75% of maximal work capacity. **Resistance training included?** Callisthenics. **Total duration:** 4 weeks supervised and then continued at home. **Co-interventions:** All participants went to the Rehabilitation Center for 3 weeks and underwent a symptom-limited exercise test (28 ± 2 days after myocardial infarction), 24-hour Holter monitoring, and coronary arteriography (31 ± 3 days after the acute episode). All participants attended colloquial sessions, held by a cardiologist and a psychologist, dealing with secondary prevention of cardiovascular diseases and stressing dietary changes and smoking cessation. **Comparator:** Discharged after rehab centre and clinically re-examined 1 month later when they underwent a second symptom-limited exercise test. ***Co-interventions:*** as above
Outcomes	CHD mortality, revascularisations
Source of funding	NR
Conflicts of interest	NR
Notes	Ejection fraction (EF) was the only prognostic factor. Among 51 participants with EF < 41%, relative risk for the 27 untrained participants was 8.63 times higher than for 24 trained ones. (P = 0.04)

Specchia 1996 *(Continued)*

If EF > 40%, estimated risk for untrained participant was 1.07 times higher than for trained.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	No losses to follow-up.
Selective reporting (reporting bias)	High risk	While survival data is provided, detailed clinical information was obtained from all participants at 3- to 4-month intervals and these data are not reported.

Ståhle 1999

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** October 1994 to June 1997 **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: participants ≥ 65 years admitted because of an acute coronary event. To be included, the participants had to perform a pre-discharge exercise test at a workload ≥ 70 W in men and ≥ 50 W in women. For the group with unstable angina pectoris, a ST60 depression of > 1 mm in ≥ two adjacent leads had to be documented at the exercise test. **Exclusion criteria:** neurological sequelae, memory dysfunction, orthopaedic disability, inability to understand Swedish, coronary intervention planned within 3 months or other complicating diseases. **N randomised:** total: 109; intervention: 56; comparator: 53 **Diagnosis (% of participants):** Congestive heart failure: 6% Previous AMI: 27% Angina pectoris: 38% Previous PCI: 11% Previous CABG: 17% **Age years, (range): i**ntervention: 71 (64-84); comparator: 68 (65-83) **Percentage male:** intervention: 73%; comparator: 75%

Ståhle 1999 *(Continued)*

	Ethnicity: NR
Interventions	**Intervention:** 50 min aerobic outpatient group-training programme (including warm-up and cool-down) 3 times a week for 3 months. Complete programme was supervised by specialised physiotherapist and supported by music which guided intensity of performance during session. Training followed by 10 min of music-supported relaxation. After 3 months, participants had possibility of participating in programme once a week for another 3 months. **Components:** exercise. **Setting:** supervised centre-based group sessions. **Exercise programme modality:** NR **Length of session:** 50 min plus 10 min relaxation. **Frequency:** 3 times a week. **Intensity:** NR **Resistance training included?** NR **Total duration:** 3 months followed by opportunity to continue once a week for another 3 months. **Co-interventions:** none described **Comparator:** usual care - encouraged to re-start usual/prior physical activity as soon as they felt fit. **Co-interventions:** none described
Outcomes	Total mortality, CABG, PCI, health-related quality of life; Karolinska Questionnaire at 12-months.
Source of funding	National Association for Heart and Lung Patients, the Swedish Heart and Lung Foundation, the Swedish Foundation of Health Care Sciences and Allergy Research, and the King Gustaf V and Queen Victoria Foundation.
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	Clinical event data for 8 (7%) who withdrew before 3 months were not accounted for at 1 yr.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Stern 1983

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** USA **Dates participants recruited:** NR **Maximum follow-up:** 1 year. Randomised by blocks of 6 into one of three groups: exercise, group counselling & control.
Participants	**Inclusion criteria**: Aged 30 to 69 years with documented MI not less than six weeks nor more than one year prior to admission to the study. Work capacity level < 7 MET (men) or < 6 MET (women) or a Taylor Manifest Anxiety Scale raw score of 19 + or Zung Self-rating Depression Scale raw score of 40 +, or any or all of these. **Exclusion criteria:** Presence of unstable cardiovascular condition i.e. congestive heart failure, or requirement of treatment for any physical/psychological reason. **N randomised:** total: 106; intervention: 42; comparator (usual care): 29; group counselling: 35 (no data analysed in this review) **Diagnosis (% of participants):** MI: 100% **Age (mean):** 54 **Percentage male:** intervention: 90%; comparator: 76% **Ethnicity:** 85% white
Interventions	**Intervention:** Three one-hour sessions per week over a 12-week period. All exercises were dynamic, involving rhythmic movements against resistance. Half were upper limb (rowing machine, arm wheel, and arm ergometer) and half were lower limb (treadmill, cycle, and step ergometer). Participants exercised upper and lower limbs alternately for four minutes with two minutes of rest in between. The intensity of exercise was determined by heart-rate response, the target level being 85% of the peak exercise heart rate achieved in the first evaluation. If the heart rate was consistently above or below target, the work load was increased or decreased. **Components:** exercise. **Setting:** supervised in a centre. **Exercise programme modality:** e.g. rowing, treadmill, cycle or step ergometer. **Length of session:** 1 hour. **Frequency:** 3 times a week. **Intensity:** Target HR 85% of HR max at exercise tolerance test. **Resistance training included?** No. **Total duration:** 12 weeks. **Co-interventions:** none described. **Comparator:** followed up by their physicians and given routine post-MI medical care. Participants were requested to not join a supervised exercise or a formal counselling programme. **Co-interventions*:*** none described.
Outcomes	Mortality, non-fatal MI.
Source of funding	National Institute of Handicapped Research, Department of Education, Washington, DC.

Stern 1983 *(Continued)*

Conflicts of interest	Not reported
Notes	Minimal differences between groups at one year.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	7.7% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points.

Sun 2016

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** NR **Maximum follow-up:** 12 months
Participants	**Inclusion criteria**: 1) 60 to 75 years old 2) Stable coronary heart disease patients 3) Participants with low or medium risk of coronary heart disease (according to the risk stratification standard) **Exclusion criteria:** 1) Uncontrolled hypertension; that is, resting systolic blood pressure > 160mm Hg or resting diastolic blood pressure > 100mm Hg 2) Moderate to severe heart valve stenosis 3) Severe left aortic stenosis (stenosis degree ≥ 70%) 4) Osteoarthrosis or vascular disease of the lower extremity 5) Malignant neoplasm

Sun 2016 *(Continued)*

	N randomised: total: 70; intervention: 35; comparator: 35 **Diagnosis (% of participants):** intervention: stable angina pectoris (57.1%), asymptomatic post MI (20%), old MI (28.6%), post PCI (25.7%); comparator: stable angina pectoris (51.4%), asymptomatic post MI (5.7%), old MI (22.9%), post PCI (42.9%), post CABG 5.7%. **Age (mean, range):** intervention: 65, range 61-72; comparator: 65, range 60-70. **Percentage male:** intervention: 54%; comparator: 69% **Ethnicity:** NR
Interventions	**Intervention:** 1) Exercise mode: Walk or jog on the exercise board (T2100 exercise board equipped with 12 leads ECG and blood pressure monitoring) 2) Exercise intensity: The heart rate reserve method was used combining self-perceived fatigue of the participant to reach 50% to 80% of the maximum exercise intensity or Borg rate of perceived exertion at 12 to 16 3) Exercise time: 30 - 60 mins, including 5 - 10 mins warm-up and relaxation exercises 4) After discharge, participants can choose one or more kinds of aerobic exercise rehabilitation from walking, jogging, walking on the treadmill, cycling, swimming, and playing badminton etc. for 3 to 5 times a week. **Components:** exercise plus education. **Setting:** centre-based (3 months), home-based (9 months) **Exercise programme modality:** walking, jogging, walking on the treadmill, cycling, swimming, and playing badminton etc. **Length of session:** 30-60 minutes. **Frequency:** 3 sessions per week. **Intensity:** 50-80% heart rate reserve or RPE 12-16. **Resistance training included?** NR **Total duration:** 12 months. **Co-interventions:** None described **Comparator:** “conventional treatment” including “health education and standard medication” **Co-interventions:** none described.
Outcomes	No relevant outcomes reported
Source of funding	Military Medicine and Geriatrics of the Headquarters of the General Staff (ZCWS14C25)
Conflicts of interest	Not reported
Notes	Study reports outcomes of BMI, BP, lipids, smoking, and no CONSORT flow diagram reported.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"random number table used"

Sun 2016 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	No details reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No details of blinding reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for lost to follow-up provided, and equal across groups
Selective reporting (reporting bias)	Unclear risk	Protocol paper not available

Toobert 2000

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** USA **Dates participants recruited:** NR **Maximum follow-up:** 24 months
Participants	**Inclusion criteria**: Postmenopausal women with coronary heart disease, defined as atherosclerosis, MI, percutaneous transluminal coronary angioplasty, and/or coronary bypass graft surgery. **Exclusion criteria:** Other life-threatening illnesses, infarction during the preceding 6 weeks, receiving streptokinase or alteplase, or being scheduled for bypass surgery. **N randomised:** total: 25; intervention: 14; comparator: 11 **Diagnosis (% of participants):** CHD: 100% Previous AMI: 52% PCI: 36% CABG: 28% **Age (mean ±SD):** intervention: 64 ± 10; comparator: 63 ± 11 **Percentage male:** 0% **Ethnicity:** 92% white
Interventions	**Intervention:** Daily group physical activity sessions included warm-up, walking or aerobics, and a cool-down. Participants were individually prescribed exercise intensity based on their treadmill exercise test performance. Following the retreat, the intervention exercise programme required participants to engage in a 1-hour session per day at least 3 days each week. **Components:** exercise, education and psychological support. **Setting:** supervised sessions in a centre followed by home. **Exercise programme modality:** walking or aerobics. **Length of session:** 1 hour. **Frequency:** daily and then at least 3 days a week.

Toobert 2000 *(Continued)*

	Intensity: individually prescribed. **Resistance training included?** no. **Total duration:** 24 months. **Co-interventions:**. Participants randomised to the PrimeTime programme began the intervention with a 7-day retreat. Women were encouraged to bring their partner. As well as physical activity, the daily schedule included cooking classes, instruction in stress-management techniques including Hatha Yoga stretches, progressive deep relaxation, deep breathing, meditation, group support, smoking cessation and directed or receptive imagery.Twice-weekly 4-hour meetings followed the retreat with each meeting following a sequence similar to the retreat schedule. **Comparator:** usual care. **Co-interventions:** none described.
Outcomes	Health-related quality of life: SF-36 at 24 months
Source of funding	National Heart, Lung, and Blood Institute
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described
Incomplete outcome data (attrition bias) All outcomes	High risk	3/28 (10.7%) participants lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	High risk	While most outcomes are reported at all time points, the SF-36 is poorly reported and it is not stated for which follow-up the results are reported

Uddin 2020

Study characteristics

Methods	**Study design:** Quasi-RCT (single centre) **Country:** Bangladesh **Dates participants recruited:** July 2012 - July 2013 **Maximum follow-up:** 12 months

Uddin 2020 *(Continued)*

Participants	**Inclusion criteria**: participants admitted for elective CABG surgery, aged between 25-65 years and understood Bangla. **Exclusion criteria:** Admission for emergency CABG surgery or revision CABG surgery, any neurological problems or severe comorbidities, or they were not planning to stay in Bangladesh for ≥ 1 year after CABG surgery. **N randomised:** total: 142; intervention: 71; comparator: 71 **Diagnosis (% of participants):** post-CABG (100%). **Age (mean ± SD):** intervention: 54 ± 6; comparator: 55 ± 6 **Percentage male:** intervention: 66 (93%); comparator: 63 (89%) **Ethnicity:** NR
Interventions	**Intervention:** participants participated in a 45-min CR class (groups of 6-10, 7-8 days after surgery) in the hospital and were provided with an educational booklet in Bangla. In the class, participants were encouraged to comply with and have knowledge about medical advice, given information about the home exercise program, stress management, smoking cessation, alcohol intake and diet, encouraged to resume everyday activities and social interaction. The booklet described a home exercise training program including upper- and lower-limb exercises, breathing exercises, chest movements and aerobic exercise (walking program). Educational information provided about safe levels of activity, details of personal risk factors, useful telephone numbers, when to seek medical advice, and how to manage recurrent breathlessness or chest pain. Participants received a monthly telephone call for 12 months from a qualified physiotherapist trained by the research team regarding the CR advice booklet and exercise program. The physiotherapist answered any participant questions and reminded them to follow the CR program, and attend their next hospital appointment. **Components:** exercise plus education. **Setting:** home-based (with one initial centre-based session) **Exercise programme modality:** Upper and lower limb exercises, breathing and chest exercises, walking. **Length of session:** 30 minutes. **Frequency:** 4 sessions per week. **Intensity:** RPE 11-13. **Resistance training included?** Not clear. **Total duration:** 12 months. **Co-interventions:** None described **Comparator:** Usual care – conventional hospital discharge care including drug treatment, post-surgical information (precautions i.e. do not lift, pull or push heavy objects or weight > 5kg, lie in a supine position in bed), dietary advice from a dietician and routine follow-up hospital visits. **Co-interventions:** none described.
Outcomes	HRQoL
Source of funding	Not reported
Conflicts of interest	None declared
Notes	

Uddin 2020 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	"A quasi-random method was used to allocate patients to either a home-based CR program in addition to UC or UC alone. Allocation was done according to the week of surgery for patients, with every other week allocating patients to either the CR group or the UC group. Allocation was done by the research team and was not influenced by the preferences of the research team, patients, or relatives."
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information provided about blinding of outcome assessment
Incomplete outcome data (attrition bias) All outcomes	High risk	Intervention 10/71 (14%) Control 31/71 (44%). Missing participant numbers high and uneven across groups, and reasons for loss to follow-up not provided. Imputation not performed. Demographic characteristics of participants lost to follow-up were similar to participants with complete data at 12 months.
Selective reporting (reporting bias)	Unclear risk	Neither a study protocol nor trial registration available.

Vecchio 1981

Study characteristics	
Methods	**Study design:** RCT **Country:** Italy **Dates participants recruited:** NR **Maximum follow-up:** 1 year Randomised after exercise tolerance test, 30 days after MI.
Participants	**Inclusion criteria**: participants aged 40 to 60 years with MI **Exclusion criteria:** more than one previous MI **N randomised:** total: 50; intervention: 25; comparator: 25 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 50.1 ± 5.5; comparator: 50.1 ± 6.3 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** 100% Italians
Interventions	**Intervention:** 6 weeks physical activity programme **Components:** exercise **Setting:** NR

Vecchio 1981 *(Continued)*

	Exercise programme modality: NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 weeks **Co-interventions:** NR **Comparator:** after discharge a simple plan of daily exercises (intensity ≤ 3 METs) to perform at home **Co-interventions:** NR
Outcomes	CV mortality
Source of funding	
Conflicts of interest	
Notes	Trained participants showed a better mid-term prognosis than controls, but this could not be explained by the physical training procedure.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	24% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Vermeulen 1983

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Netherlands **Dates participants recruited:** NR **Maximum follow-up:** 5 years Randomised 4 to 6 weeks post-MI after exercise tolerance test.

Vermeulen 1983 *(Continued)*

Participants	**Inclusion criteria**: Men (aged 40 to 55 years) who were hospitalised within 6 hours after onset of complaints of first myocardial infarction. **Exclusion criteria:** Combination of bundle branch block and anterior myocardial infarction **N randomised:** total: 98; intervention: 47; comparator: 51 **Diagnosis (% of participants):** MI: 100% **Age (mean ± SD):** intervention: 49.4 ± 3.7; comparator: 49.1 ± 4.5 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** The rehabilitation consisted of multidisciplinary intervention (physical, social, psychological). **Components:** exercise, psychological support. **Setting:** Centre **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 - 8 weeks. **Co-interventions:** none described. **Comparator:** usual care. **Co-interventions:** none described.
Outcomes	Mortality, non-fatal MI.
Source of funding	Prevention Fund, the Hague.
Conflicts of interest	NR
Notes	Study authors conclude that cardiac rehab benefits participants after MI due to direct effect on myocardial perfusion and to lowering of cholesterol levels.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias)	Low risk	No losses to follow-up.

Vermeulen 1983 *(Continued)*
All outcomes

Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points (although absolute values not always given).

VHSG 2003

Study characteristics	
Methods	**Study design:** Multicentre RCT (3 sites) **Country:** Norway **Dates participants recruited:** NR **Maximum follow-up:** 2 years
Participants	**Inclusion criteria**: participants admitted to hospital for acute MI, unstable angina pectoris or after coronary artery bypass grafting. **Exclusion criteria:** none described. **N randomised:** total: 197; intervention: 98; comparator: 99 **Diagnosis (% of participants):** AMI: 37% UAP stabilised: 2% PCI: 20% CABG: 25% **Age (mean ± SD):** intervention: 54 ± 8; comparator: 55 ± 8 **Percentage male:** intervention: 91%; comparator: 84% **Ethnicity:** NR
Interventions	**Intervention:** The first phase lasted for 6 weeks with supervised physical exercise in addition to a regular group meeting twice a week. Each training session started with 15 min of warm up followed by 20 min of dynamic endurance training, 10 min of active cool-down activities and finally 10 min of stretching and relaxation. Large muscle groups in the arms and legs were used simultaneously to achieve higher exercise intensity (11-13 on the Borg scale). No weight lifting took place. This was followed by 9 weeks of supervised physical exercise twice weekly. The intensity level was increased to achieve an exertion rate equal to jogging (13-15 on the Borg scale). Participants were then encouraged to perform regular training at home. **Components:** exercise, education and psychological support. **Setting:** supervised, group sessions in a centre. **Exercise programme modality:** "dynamic endurance training". **Length of session:** 55 min. **Frequency:** twice a week. **Intensity:** RPE 11-13 on the Borg Scale, increased to 13-15 after 6 weeks. **Resistance training included?** No. **Total duration:** 15 weeks.

VHSG 2003 *(Continued)*

	Co-interventions: The multidisciplinary CR of "Heart School" comprised dietary advice, smoking cessation, physical activity counselling, risk factor management, psychosocial management and health education. **Comparator:** Usual care: participants received usual standardised nurse-based information on CHD in general and lifestyle measures. **Co-interventions:** none described.
Outcomes	Total mortality.
Source of funding	The Norwegian Government Directory for Health and Bristol Myers Squib, Norway.
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomised"
Allocation concealment (selection bias)	Low risk	"[Randomization] was performed with pre-prepared sealed opaque envelopes containing details on group allocation. The patients opened the envelopes themselves so that their allocation to IP or UC was revealed to them without the prior knowledge of the study investigators".
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	17.8% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Wang 2012

Study characteristics

Methods	**Study design:** Multicentre RCT (2 sites) **Country:** China **Dates participants recruited:** Oct 2005 to April 2007 **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: Inclusion criteria comprised a documented diagnosis of acute MI, the ability to speak and read Chinese, a return to living at home after hospital discharge, availability for telephone follow-up, and availability for meetings after hospital discharge. **Exclusion criteria:** Exclusion criteria comprised a known history of major psychiatric illness, pre-existing mobility problems, unstable angina, severe complications such as uncontrolled arrhythmias

Wang 2012 *(Continued)*

	or heart failure, and other conditions that could be aggravated by exercise, such as a resting systolic blood pressure (BP) > 200 mmHg or a resting diastolic BP > 110 mmHg. **N randomised:** total: 160; intervention: 80; comparator: 80 **Diagnosis (% of participants):** AMI: 100% **Age (mean ± SD)**: intervention: 57.3 (± 8.6); comparator: 58.3 (± 10.4) **Percentage male:** intervention: 85.3%; comparator: 81.5% **Ethnicity:** NR
Interventions	**Intervention:** A 6-week, home-based rehabilitation programme using a self-help heart manual given to the rehab participants just before discharge from hospital. The manual was similar to the UK Heart Manual but incorporated appropriate sociocultural components such as tai chi, qi gong, and Chinese diet. Section 1 consists of 6 weekly topics on health education. Section 2 answers commonly asked questions about medication, PCI, anxiety and depression etc. Section 3 presents information on normal values of cardiac physiological risk parameters. The rehabilitation group received the manual and the introductory session in addition to usual care. The exercise component of the manual is not described in this paper, and there is no reference to its description elsewhere. **Components:** exercise plus education. **Setting:** home. **Exercise programme modality:** not described. **Length of session:** not described. **Frequency:** not described. **Intensity:** not described. **Resistance training included?** not described. **Total duration:** not described. **Co-interventions:** participants in both groups were telephoned by the principal researcher 3 weeks after discharge. For the rehabilitation group, the researcher checked the participants' progress, encouraged adherence to exercise, and helped solve problems that had arisen using the manual. This consultation lasted approximately 30 minutes, with contact designed to promote participant confidence and self-management, and minimise dependency and the possibility that the nurse could influence outcomes. **Comparator:** The usual care group received instructions on taking medications, information leaflets about cardiac risk factors, a healthy diet, and smoking cessation, and a follow-up appointment. **Co-interventions:** The researcher devoted an equal amount of time to telephone contact with the control group, giving general advice on any problems encountered and encouraging and supporting appropriate actions.
Outcomes	Mortality, HRQoL
Source of funding	NR
Conflicts of interest	NR
Notes	Baseline characteristics only reported for those followed up until 6 months i.e. 68 in intervention group and 65 in usual care group.

Wang 2012 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Patients …….were enrolled and assigned to either the experimental or the control group, using a computer-generated random number".
Allocation concealment (selection bias)	Unclear risk	Allocation concealment was not described.
Blinding of outcome assessment (detection bias) All outcomes	High risk	"the absence of a blinded condition may threaten its internal validity. In addition, the principal researcher played the role of both intervener and outcome assessor, which may have influenced participants to provide desired answers, and so interviewer bias cannot be excluded"
Incomplete outcome data (attrition bias) All outcomes	Low risk	12/80 (15%) lost from intervention group. 15/80 (18.8%) lost from the control group. Numbers and reasons were given and were similar for both groups.
Selective reporting (reporting bias)	Low risk	All outcomes described were reported for all time points.

West 2012

Study characteristics	
Methods	**Study design:** Multicentre RCT (14 sites) **Country:** England and Wales, UK **Dates participants recruited:** August 1997 to April 2000 **Maximum follow-up:** 7 to 9 years
Participants	**Inclusion criteria**: Admission to hospital with a principal primary diagnosis of acute MI (two of the three standard criteria 'typical history', electrocardiographic features and cardiac enzymes), discharged home within 28 days, local resident and able to give informed consent with no age or gender restrictions. **Exclusion criteria:** Physical frailty, mental confusion, serious co-existing disease, communication difficulty, previous cardiac rehabilitation and discharged to hospice or another hospital. **N randomised:** total: 1813; intervention: 903; comparator: 910 **Diagnosis (% of participants):** Acute MI: 100% **Age (mean ± SD):** intervention: 64.2 ± 11.2; comparator: 64.7 ± 10.9 **Percentage male:** intervention: 72.6%; comparator: 74.4% **Ethnicity:** NR
Interventions	**Intervention:** Exercise training was the largest component, typically occupying half of the available time including warm up and cool down, and used exercise equipment in physiotherapy gyms. Relaxation was primarily physical following 'cooling down' from exercise with little or no 'stress management' training.

West 2012 *(Continued)*

Components: exercise plus education plus psych.

Setting: centre-based supervised programmes which varied by centre.

Exercise programme modality: varied by centre.
Length of session: averaged 20 hours over 6-8 weeks.
Frequency: weekly or bi-weekly.
Intensity: NR
Resistance training included? NR

Total duration: 6-8 weeks.

Co-interventions: The programmes comprised exercise training, health education about heart, heart disease, risk factors and treatment, counselling for recovery and advice for long-term secondary prevention. All involved at least one other discipline (exercise physiologist, dietician, pharmacist, health promotion specialist, psychologist, counsellor, social worker, physician and/or cardiologist).

Comparator: All participants in the trial (and in the 'elective hospitals' comparison) had similar care in all respects other than referral to cardiac rehabilitation, receiving available explanatory booklets, being advised to see their general practitioner (GP) and attend routine outpatient follow-up, with referral for further cardiac investigations or interventions as appropriate.

Co-interventions: none described.

Outcomes	Mortality, MI, revascularisations, hospitalisation, HRQoL.
Source of funding	NHS Research and Development Programme (northern region) and the Heart Research Fund for Wales.
Conflicts of interest	None declared.
Notes	An additional 331 participants were entered in two matched pairs of 'elective rehabilitation' and 'elective control' hospitals; 197 to rehabilitation and 134 to control. These participants did not contribute any data used in the systematic review.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Patients were randomised centrally" – it does not state how.
Allocation concealment (selection bias)	Low risk	"Patients were randomised centrally on a preset protocol, daily and blind as to entry characteristics and baseline measures, …..The names of those randomised to rehabilitation were passed to the local programme coordinator".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Secondary outcomes were assessed at 1 year….blind to rehabilitation status".
Incomplete outcome data (attrition bias) All outcomes	Low risk	5% lost to follow-up from each group (2 year interviews); "follow-up interviews were completed in 95% of surviving patients in both groups"
Selective reporting (reporting bias)	Low risk	All outcomes reported for all time points.

WHO 1983

Study characteristics	
Methods	**Study design:** Multicentre RCT (24 sites; 12 centres accepted for meta analysis.) **Country:** Multiple European countries **Dates participants recruited:** 1972 to 1974 **Maximum follow-up:** 3 years Participants randomised on discharge from hospital.
Participants	**Inclusion criteria**: Men < 65 years with first or consecutive MI. **Exclusion criteria:** NR **N randomised:** total: 3184; intervention: 1655; comparator: 1529 **Diagnosis (% of participants):** MI: 100% **Age (years):** intervention: 52.3; comparator:53.5 **Percentage male:** intervention: 100%; comparator: 100% **Ethnicity:** NR
Interventions	**Intervention:** Comprehensive programme dependent on local provision. Physical training was not compulsory but was strongly recommended. **Components:** exercise, education and psychosocial support. **Setting:** centre. **Exercise programme modality:** NR **Length of session:** NR **Frequency:** NR **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 weeks. **Co-interventions:** The intervention had to be at the highest possible level available locally. It had to be comprehensive, with the aim of improving health and reducing IHD risk. It comprised treatment of heath failure, arterial hypertension etc, risk factor modification, weight loss and improving physical working capacity. **Comparator:** usual care. **Co-interventions:** none described.
Outcomes	Total mortality, CVD, CHD & sudden death. Fatal & non-fatal re-infarction.
Source of funding	WHO Regional Office for Europe and the Ministries of Health of the participating member states.
Conflicts of interest	
Notes	Methodological problems with the execution of the study allowed only death and re-infarction to be successfully used as end points.

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**

WHO 1983 *(Continued)*

Random sequence generation (selection bias)	High risk	"Patients were randomised at admission.....by means of random number tables". However, only "12 centres out of the 24 seemed to have achieved proper randomisation in their groups of R and C patients"
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No description of withdrawals or dropouts. Varied greatly from site to site.
Selective reporting (reporting bias)	Low risk	All clinical endpoints were reported for 12, 24 and 36 month follow-ups.

Wilhelmsen 1975

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** Sweden **Dates participants recruited:** 1968-1970 **Maximum follow-up:** 5 years Participants randomised on discharge.
Participants	**Inclusion criteria**: All participants born in 1913 or later who suffered a MI during the period 1968-1970 and were discharged alive from the hospital. **Exclusion criteria:** none described. **N randomised:** total: 315; intervention: 158; comparator: 157 **Diagnosis (% of participants):** MI: 100% **Age (years):** intervention: 50.6; comparator: 50.6 **Percentage male:** intervention: 87%; comparator: 90% **Ethnicity:** NR
Interventions	**Intervention:** The training programme started 3 months after the MI. The programme at the hospital consisted of three supervised half-hour training sessions a week. It included dynamic work, such as callisthenics, cycling, and running in an interval programme with individualised intensity. If a participant found it difficult to attend the hospital for training, then individualised programmes were developed for training at home or in the workplace. **Components:** exercise. **Setting:** supervised in a centre. **Exercise programme modality:** e.g. cycling, running.

Wilhelmsen 1975 *(Continued)*

	Length of session: 1/2 hour. **Frequency:** three times a week. **Intensity:** 144 ± 18 beats/min; 80% of their heart rate increasing capacity (if no sign of cardiac limitation); 136 ± 19 beats/min in mean highest training heart rate (if limited by angina pectoris). **Resistance training included?** Callisthenics. **Total duration:** NR - see notes below. **Co-interventions:** At discharge from hospital, all participants were given general recommendations about gradually increasing physical activity during the convalescence period. **Comparator:** usual care. **Co-interventions:** as above.
Outcomes	Mortality, re-infarction.
Source of funding	NR
Conflicts of interest	NR
Notes	1 year post-MI, only 39% of those who started training were training at the hospital. A further 21% trained at home or at work.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"By the use of a random number table the patients were allocated..."
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The exercise test 1 yr after the MI followed the same protocol but was conducted by another physician, who did not know if the patients belonged to the experimental or the control group".
Incomplete outcome data (attrition bias) All outcomes	Low risk	No losses to follow-up for clinical events.
Selective reporting (reporting bias)	Unclear risk	Outcomes to be collected were not clearly described in the methods.

Xu 2017

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** January 2014 - September 2015 **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**:

Xu 2017 *(Continued)*

	1) Meet the diagnostic criteria of the coronary heart disease, referring to the 13th edition of the Practice Internal Medicine (a Chinese medical textbook) 2) From 39 to 70 years old 3) Participants who are easy to communicate with 4) Long-term resident in the local area and completed the informed consent 5) Hemodynamics were stable after PCI **Exclusion criteria:** 1) People with serious arrhythmia (such as atrioventricular block, atrial fibrillation, ventricular tachycardia, etc.), myocarditis, cardiomyopathy, and the installation of a pacemaker 2) People with serious cardiac insufficiency (NYHA class IV), left ventricular ejection fraction < 30% 3) People with severe cerebrovascular diseases (such as cerebral infarction and cerebral haemorrhage) 4) People with serious pulmonary diseases (such as chronic obstructive pulmonary disease, emphysema, pulmonary heart disease, etc.) 5) People with rheumatoid arthritis, osteoarthritis, muscles and other diseases that seriously affect physical activity 6) People with serious organic diseases and abnormal liver and kidney function **N randomised:** total: 130; intervention: 65; comparator: 65 **Diagnosis (% of participants):** post-PCI patients with unstable angina (100%). **Age (mean ± SD):** intervention: 56.4 ± 8.1; comparator: 58.6 ± 8 **Percentage male:** intervention: 46 (79%); comparator: 47 (78%) **Ethnicity:** NR
Interventions	**Intervention:** There are 2 stages. The first stage is after patients had PCI until they were discharged, the second is from when they were discharged to the third month after PCI. The first stage: 1) The first day after PCI, advise patients to walk for 200 meters per time for 5 times a day. 2) The second day after PCI, advise patients to walk for 300 meters per time for 5 times a day. 3) The third day after PCI, advise patients to walk for 500 meters per time for 5 times a day. They can also go up and down a flight of stairs depending on their own conditions. The second stage: 1) After the patients discharged in the first month after PCI: Walking 30 to 40 mins with the speed of 65-75 m/min for 3 times a week; or, walking for 10 to 15 mins 3 times a day with a 5-min break among them for 3 times a week; or, walking for 15 to 20 mins twice a day with a 5-min break between them for 3 times a week. After each time of walking, guide patients to do some chest enlargement, slow leg lift and upper limb extension exercise, so that the patients' heart rate, blood pressure can be back to normal levels before walking. 2) 1 to 2 months after PCI: The exercise mode was repeated in alternations of walking and brisk walking. Walk for 90 seconds, followed by brisk walking for 45 s. Repeat above. The walking speed is at 65-75 m/min, and the brisk walk-

Xu 2017 *(Continued)*

ing speed is at 85-95 m/min. This exercise was 30~40 min each time for 3 times a week. After each time, patients would have relaxation exercise for 10 to 15 mins.

3) 2 to 3 months after PCI:

A set of exercise rehabilitation, includes a combination of upper limb and lower limb exercise, combined with resistance training of elastic band and balance training on yoga mat. The whole process can be divided into the pre-activity stage (8-10 min), the exercise march stage (30-40 min) and the recovery stage (10-15 min).

Components: exercise only.

Setting: centre-based

Exercise programme modality: Mostly walking, some upper and lower limb exercise, resistance training and balance exercises.
Length of session: around 30-40 mins up to 1 hour (length increases over time).
Frequency: 3 times per week (stage 2).
Intensity: walking speed 65-75 m/min up to 85-95 m/min (brisk walking).
Resistance training included? Yes, stage 2 included resistance training with elastic bands.

Total duration: 3 months.

Co-interventions: None described

Comparator: "All patients received conventional drug therapy and post-PCI knowledge education"

Co-interventions: none described.

Outcomes	No outcomes reported of relevance, no CONSORT flow diagram
Source of funding	Not reported
Conflicts of interest	Not reported
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"…used random sampling method to divide patients into intervention and control…."
Allocation concealment (selection bias)	Unclear risk	No details reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No details reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Reasons for participants lost to follow-up not reported
Selective reporting (reporting bias)	Unclear risk	No published protocol available

Yu 2003

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** NR **Maximum follow-up:** 2 years
Participants	**Inclusion criteria**: Obese participants with CHD who had either recent AMI or had undergone elective PCI in last 6 weeks. **Exclusion criteria:** Post-infarction angina without revascularisation procedures, significant valvular stenosis, active pericarditis or myocarditis, severe uncontrolled hypertension, physical problems that precluded exercise training, cognitive impairment, malignancies that limited life span to 1 year. **N randomised:** total: 112; intervention: 72; comparator: 40 **Diagnosis (% of participants):** AMI: 64% PCI: 36% **Age (mean ±SD):** intervention: 62.3 ± 11.2; comparator: 61.2 ± 10.2 **Percentage male:** intervention: 82%; comparator: 75% **Ethnicity:** NR
Interventions	**Intervention:** Phase 1 was an inpatient ambulatory programme that lasted 7 to 14 days. Phase 2 was a 16-session, twice weekly, outpatient exercise and education programme lasting for 8 weeks. Each session included 1 hour of education class followed by 2 hours of exercise training. The first hour of training focused on aerobic CV training with a target intensity of 65% to 85% of maximal aerobic capacity. This included treadmill, ergometry, rowing, stepper, arm ergometry, and dumbbell and weight training.The next hour was conducted by an occupational therapist in which domiciliary or vocational environment-focused training was performed. Phase 3 was a community-based home exercise programme for another 6 months. **Components:** exercise and education. **Setting:** centre followed by home. **Exercise programme modality:** treadmill, ergometry, rowing, stepper, arm ergometry, and dumbbell. **Length of session:** 2 hours (for 8 weeks) then unspecified at home. **Frequency:** twice a week (for 8 weeks) then unspecified at home. **Intensity:** 65% to 85% of maximal aerobic capacity. **Resistance training included?** Weight training. **Total duration:** 8 1/2 months. **Co-interventions:** Phase 4 was a long-term follow-up programme until the end of 2 years, which included half-yearly monitoring of lipid profiles, and again stressed the importance of regular exercise and risk factor modification. **Comparator:** conventional medical therapy.

Yu 2003 *(Continued)*

	Co-interventions: The control group attended a 2-hour talk that explained CHD, the importance of risk factor modification, and potential benefits of physical activity, but without undergoing an outpatient exercise training programme.
Outcomes	HRQoL: 3F-36 at 8 & 24 months.
Source of funding	NR
Conflicts of interest	NR
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported.
Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	Low risk	All participants accounted for.
Selective reporting (reporting bias)	Low risk	All outcomes were reported at all time points.

Yu 2004

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** NR **Maximum follow-up:** 2 years
Participants	**Inclusion criteria**: participants with recent AMI or after elective PCI. **Exclusion criteria:** Coronary heart disease without revascularisation procedures, significant mitral stenosis (defined as a mitral valve area of 1 cm^2) or aortic stenosis (defined as an aortic valve gradient of 50 mmHg), active pericarditis or myocarditis, severe uncontrolled hypertension (systolic blood pressure 200 mmHg and/or diastolic blood pressure 100 mmHg), physical problems that precluded exercise, cognitive impairment or unwillingness to join the programme, malignancies that limited life span to less than 1 year. **N randomised:** total: 269; intervention: 181; comparator: 88 **Diagnosis (% of participants):**

Yu 2004 *(Continued)*

	AMI: 72% PCI: 28% **Age (mean ±SD):** intervention: 64 ± 11; comparator: 64 ± 11 **Percentage male:** intervention: 76%; comparator: 75% **Ethnicity:** NR
Interventions	**Intervention:** Phase 1 was an inpatient ambulatory programme that lasted 7 to 14 days. Phase 2 was a 16-session, twice weekly, outpatient exercise and education programme lasting for 8 weeks. Each session included 1 hour of education class followed by 2 hours of exercise training. The first hour of training focused on aerobic CV training with a target intensity of 65% to 85% of maximal aerobic capacity. This included treadmill, ergometry, rowing, stepper, arm ergometry, and dumbbell and weight training. The next hour was conducted by an occupational therapist in which domiciliary or vocational environment-focused training was performed. Phase 3 was a community-based home exercise programme for another 6 months. **Components:** exercise and education. **Setting:** centre followed by home. **Exercise programme modality:** treadmill, ergometry, rowing, stepper, arm ergometry, and dumbbell. **Length of session:** 2 hours (for 8 weeks) then unspecified at home. **Frequency:** twice a week (for 8 weeks) then unspecified at home. **Intensity:** 65% to 85% of maximal aerobic capacity. **Resistance training included?** Weight training. **Total duration:** 8 1/2 months. **Co-interventions:** Phase 4 was a long-term follow-up programme until the end of 2 years, which included half-yearly monitoring of lipid profiles, and again stressed the importance of regular exercise and risk factor modification. **Comparator:** conventional medical therapy. **Co-interventions:** The control group attended a 2-hour talk that explained CHD, the importance of risk factor modification, and potential benefits of physical activity, but without undergoing an outpatient exercise training programme.
Outcomes	Total mortality, HRQoL, costs.
Source of funding	Health Care & Promotion Fund Committee of Hong Kong.
Conflicts of interest	"No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit upon the authors(s) or upon any organization with which the author(s) is/are associated."
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"randomized"

Yu 2004 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	Not reported.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Blinding not described.
Incomplete outcome data (attrition bias) All outcomes	High risk	24% lost to follow-up; no description of withdrawals or dropouts.
Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

Zhang 2018

Study characteristics	
Methods	**Study design:** single-centre RCT **Country:** China **Dates participants recruited:** January 2010 - December 2012 **Maximum follow-up:** 6 months
Participants	**Inclusion criteria**: participants admitted to the outpatient clinic after successful PCI for ST-segment elevated MI between January 2010 and December 2012. **Exclusion criteria:** A large area of myocardial infarction, heart failure, acute systemic illness, systolic BP > 180 mmHg at rest, diastolic BP > 110 mmHg at rest, acute metabolic disorders, uncontrolled malignant arrhythmia, and skeletal vascular disease. **N randomised:** total: 130; intervention: 65; comparator: 65 **Diagnosis (% of participants):** post-PCI for STEMI (100%). **Age (mean ± SD):** intervention: 70.3 ± 10.7; comparator: 69.8 ± 10.4 **Percentage male:** intervention: 59 (90.8%); comparator: 54 (83.1%) **Ethnicity:** NR
Interventions	**Intervention:** GP formulated individual aerobic exercise program that could be performed in the participants' homes or at specialised rehabilitation facilities in the community. Phase II CR optimally initiated within 2 weeks of discharge (lasting 6-8 weeks). Most available form of exercise was walking, but other forms of aerobic exercise were acceptable. HR < 130 bpm or resting HR plus 30 bpm, or RPE 11-15. Participants exercised 2-3 times per week, interval or continuous training for 15-30 minutes. Phase III started from month 3 to 1 year. Target HR 60-75% max HR, RPE 12-16, 30-45 minutes per session, no less than 3-5 times per week. **Components:** exercise only. **Setting:** home- or centre-based (community), participant choice **Exercise programme modality:** walking. **Length of session:** 15-30 minutes, increasing to 30-45 minutes. **Frequency:** 2-3 sessions per week, increasing to 3-5. **Intensity:** < 130 bpm or RPE 11-13, increasing to 60-75% max HR or RPE 12-16.

Zhang 2018 *(Continued)*

	Resistance training included? No. **Total duration:** 12 months. **Co-interventions:** None described **Comparator:** Usual care and conventional drug therapy post-PCI **Co-interventions:** none described.
Outcomes	Mortality, MI hospitalisations
Source of funding	Supported by Research Project for practice Development of National TCM Clinical Research Bases (JDZX2015133)
Conflicts of interest	None declared
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No information reported
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	No information reported
Incomplete outcome data (attrition bias) All outcomes	Low risk	No participants reported missing for outcomes of interest, all participants completed the study
Selective reporting (reporting bias)	Unclear risk	No published protocol paper or trial registration, very little description in the methods section about outcome assessment

Zwisler 2008

Study characteristics

Methods	**Study design:** single-centre RCT **Country:** Denmark **Dates participants recruited:** January 2000 to March 2003 **Maximum follow-up:** 1 year
Participants	**Inclusion criteria**: Participants with congestive heart failure (12%), *ischaemic heart disease (58%) or high risk of ischaemic heart disease (30%). **Exclusion criteria:** Mental or social problems, severe illness, living in nursing home, unable to speak Danish

Zwisler 2008 *(Continued)*

	***Total Randomised (with IHD):** total: 446; intervention: 227; comparator: 219 **Diagnosis (% of participants):** *Ischemic heart disease: 100% **Age (years):** intervention: 67; comparator: 67 **Percentage male:** intervention: 64%; comparator: 63% **Ethnicity:** NR
Interventions	**Intervention:** A 6-week intensive CR programme including 12 exercise training sessions. **Components:** exercise, education and psychosocial support. **Setting:** centre. **Exercise programme modality:** NR **Length of session:** NR **Frequency:** twice a week. **Intensity:** NR **Resistance training included?** NR **Total duration:** 6 weeks. **Co-interventions:** Standardised CR programme which was individually tailored and carried out by a multidisciplinary team, included participant education, dietary counselling, smoking cessation, psychosocial support, risk factor management, and clinical assessment. **Comparator:** usual care. **Co-interventions:** none described.
Outcomes	Total mortality, MI, CABG, PCI, health-related quality of life: SF-36 at 1-yr follow-up.
Source of funding	Copenhagen Hospital Corporation Research Council, Danish Heart Foundation, Danish Pharmacy Foundation of 1991, Danish Research Council, Danish Center for Evaluation and Health Technology Assessment, Denmark's Ministry of the Interior and Health, Development Fund of Copenhagen County, Villadsen Family Foundation, Eva and Henry Frænkel's Memorial Foundation, Builder LP Christensen's Foundation, Danish Animal Protection Foundation, Bristol Meyers Squibb, Merck Sharp and Dohme, AstraZeneca, The Copenhagen Trial Unit, and Bispebjerg Hospital.
Conflicts of interest	NR
Notes	Outcomes of interest for the IHD population were kindly provided by the authors of this study.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"The Copenhagen Trial Unit computer generated the allocation sequence and provided central secretary-staffed telephone randomization".
Allocation concealment (selection bias)	Low risk	"The essential patient data were registered, and the result of the randomization as delivered to the research nurse, who informed the CCR team and the patient about the allocation".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	"The ... team collected secondary outcome measures blinded to intervention at baseline and without blinding at 12 months. An independent statistician analyzed the primary outcome measure blinded to intervention arm.
Incomplete outcome data (attrition bias)	Low risk	All IHD participants accounted for.

Zwisler 2008 *(Continued)*
All outcomes

Selective reporting (reporting bias)	Low risk	All outcomes reported at all time points.

ACE: acute coronary event
ACS: acute coronary syndrome
AMI: acute myocardial infarction
BMI: body mass index
CABG: coronary artery bypass graft
CAD: coronary artery disease
CAGS: Coronary artery graft surgery
CCU: coronary care unit
CHD: coronary heart disease
CHF: coronary heart failure
CR: cardiac rehabilitation
CV: cardiovascular
CVD: cardiovascular disease
ECG: electrocardiogram
ET: exercise training
FU: follow-up
GI: gastrointestinal
HR: heart rate
HRQL/HRQoL: health-related quality of life
IHD: ischaemic heart disease
Kpm/min: kilopond meters per minutes
LVEF: left ventricular ejection fraction
METS: metabolic equivalents
MI: myocardial infarction
MOS: Medical Outcomes Study
MVPA: moderate-to-vigorous physical activity
NR: not reported
PCI: percutaneous coronary intervention
PTCA: percutaneous transluminal coronary angioplasty
pts: participants
PWC: physical work capacity
RCT: randomised controlled trial
RPE: rating of perceived exertion
RTW: return to work
SPPB: short physical performance battery
STEMI: ST segment elevation myocardial infarction
$V0_2$max: maximum oxygen uptake
WHO: World Health Organisation
W: watts
6MWT: six minute walk test

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

Study	Reason for exclusion
ACTRN12617000312347	Ineligible comparator
ACTRN12618001458224	Ineligible comparator
Agren 1989	Improper method of randomisation (based on date of birth)
Ahmadi 2020	Systematic review/meta-analysis

Study	Reason for exclusion
Alharbi 2016	Ineligible study design
Al Namat 2017	Ineligible study design
Alsaleh 2012	Not relevant
An 2020	Systematic review/meta-analysis
Andersson 2010	Comparator received exercise
Asbury 2012	Follow-up only 16 weeks
Astengo 2010	Prehabilitation and outcomes of interest not measured or reported
Avila 2020	Participants received prior CR
Ballantyne 1982	No useful outcome data measured or reported
Bär 1992	Method of randomisation was inadequate; of a study population of 265 across 5 centres, only one centre randomised their participants, leaving a control group of 50 and an intervention group of 215
Baumgarten 2017	Ineligible study design
Beland 2020	Systematic review/meta-analysis
Bettencourt 2005	Only a small subset of randomised participants responded via questionnaire. Incomplete outcome data
Bilinska 2010	Follow-up only 6 weeks
Bilinska 2013	Follow-up only 6 weeks
Björntorp 1972	Not a randomised study - participants divided alternately after admission
Blokzijl 2018	Systematic review/meta-analysis
Blumenthal 1997	Control group was not randomised, but selected on geographical basis
Bo 2015	Ineligible participant population
Borg 2017	Ineligible intervention
Bourke 2010	Trial terminated early due to poor recruitment
Bricca 2020	Systematic review/meta-analysis
Broers 2020	Ineligible participant population
Bubnova 2014	Both groups recommended a home exercise training programme
Busch 2012	Comparator received exercise
Butler 2009	Participants had already received rehabilitation

Study	Reason for exclusion
Candelaria 2020	Systematic review/meta-analysis
Carlsson 1997	Participants in both groups invited to join an exercise programme prior to randomisation
Chang 2010	Non-RCT
Chatian 2014	Follow-up only 3 months
Chen 2016	"Our ancillary study was designed to evaluate the probable positive effects of the integrated care team, especially inmodifiable risk-factor control and exercise capacity." No outcomes of interest measured or reported
Chen 2017	Systematic review/meta-analysis
ChiCTR1800015823	Ineligible study design
ChiCTR1800016209	Ineligible comparator
ChiCTR1800016308	Ineligible participant population
ChiCTR1800020411	Ineligible study design
ChiCTR-IOR-14005743	Ineligible study design
ChiCTR-IOR-17012684	Ineligible study design
ChiCTR-IOR-17014149	Ineligible study design
ChiCTR-IPR-17011445	Ineligible comparator
Chokshi 2018	Ineligible intervention
Chow 2012	Intervention does not contain exercise
Christa 2019	Ineligible study design
Claes 2020	Prior CR
Clark 2017	Prior CR
Conboy 2020	Ineligible comparator
Cugusi 2020	Systematic review/meta-analysis
da Costa Torres 2016	Ineligible study design
Dalçóquio 2020	Ineligible study design
Davoodvand 2009	Ineligible study design
De Bakker 2020	Ineligible comparator
Deng 2020	Ineligible study design
Devi 2014	Not relevant

Study	Reason for exclusion
DRKS00007569	Ineligible study design
Edstrom-Pluss 2009	Comparator received exercise
Engelen 2020	Ineligible intervention
Espinosa 2004	Non-RCT
Fontes-Carvalho 2015	Ineligible study design
Francis 2019	Systematic review/meta-analysis
Franssen 2020	Systematic review/meta-analysis
Fu 2019	Systematic review/meta-analysis
Gao 2007	Ineligible comparator
Gao 2020	Ineligible comparator
Garcia-Bravo 2020	Ineligible comparator
Gerlach 2020	Systematic review/meta-analysis
Ghashghaei 2012	Non-RCT
Giallauria 2009	No outcomes of interest were measured or reported
Giallauria 2012	No outcomes of interest were measured or reported
Giallauria 2013	No outcomes of interest were measured or reported
Giannuzzi 2008	All participants (treatment and control) participated in 3 to 6 week cardiac rehabilitation programme (including supervised exercise sessions) prior to randomisation. Control group was not "usual care"
Gielen 2003	No outcomes of interest were measured or reported
Goel 2013	Ineligible study design
Gong 2015	Ineligible participant population
Grant 2018	Ineligible study design
Ha 2011	Non-RCT
Hadadzadeh 2016	Ineligible study design
Haddadzadeh 2011	Follow-up only 12 weeks
Hansen 2009	Non-RCT
Hansen 2010	Non-RCT
Hanssen 2009	Intervention does not contain exercise

Study	Reason for exclusion
Hawkes 2009	Intervention does not contain exercise
He 2018	Systematic review/meta-analysis
He 2020b	Ineligible study design
Heldal 2000	No outcomes of interest were measured or reported
Herring 2018	Prior CR
Hoejskov 2019	Ineligible study design
Hojskov 2016	Ineligible study design
Houle 2011	No outcomes of interest were measured or reported
Huerre 2010	Non-RCT
Indraratna 2020	Systematic review/meta-analysis
IRCT20130211012439N3	Prior CR
IRCT2014061418075N2	Not relevant
Ivers 2020	Ineligible intervention
Izawa 2006	Prior CR
Jepma 2019	Ineligible study design
Jepma 2020	Ineligible study design
Ji 2019	Systematic review/meta-analysis
Jiang 2007	No useful outcome data were measured or reported
Jiang 2020	Ineligible intervention
Jiang 2020b	Ineligible study design
JPRN-UMIN000005177	Trial terminated
JPRN-UMIN000010031	Both groups received cardiac rehabilitation
Kamei 2020	Systematic review/meta-analysis
Karpova 2009	Non-RCT
Kavanagh 1973	No outcomes of interest measured or reported
Kentala 1972	Non-RCT
Keshavaraz 2020	Ineligible intervention
Kidholm 2016	Ineligible study design

Study	Reason for exclusion
Kim 2011	Non-RCT
Kim 2012	Non-RCT
Kim 2013	Non-RCT
Kim 2014	Ineligible intervention
Kirolos 2019	Systematic review/meta-analysis
Köhler 2020	Ineligible comparator
Krachler 1997	Not an exercise-based CR programme
Kubilius 2012	Non-RCT
Lavoie 2020	Ineligible intervention
Lee 2013	Non-RCT
Li 2004	Follow-up < 6 months
Liao 2003	Follow-up too short (3 to 4 weeks) and no useful outcome data reported
Lie 2009	Intervention does not contain exercise
Lin 2020	Systematic review/meta-analysis
Liu 2017	Ineligible study design
Maddison 2015	Ineligible comparator
Madssen 2014	Prior CR
Maldonado-Martin 2018	Ineligible study design
Mameletzi 2011	No outcomes of interest measured or reported
Mandic 2013	Non-RCT
Manresa-Rocamora 2020	Systematic review/meta-analysis
Mao 2021	Ineligible comparator
Mares 2018	Systematic review/meta-analysis
Martinello 2019	Systematic review/meta-analysis
Martinez 2011	Participants in the control group advised to perform home-based activity
Mayer-Berger 2014	Comparator received exercise
McCleary 2020	Ineligible intervention
McDermott 2019	Prior CR

Study	Reason for exclusion
McGregor 2020	Systematic review/meta-analysis
Mehani 2012	Both groups received exercise
Mezey 2008	Non-RCT
Midence 2016	Ineligible comparator
Minneboo 2017	Ineligible comparator
Moholdt 2012a	Comparator received exercise
Moholdt 2012b	Comparator received exercise
Molino-Lova 2013	Participants had already received rehabilitation
Mozafari 2015	Ineligible study design
Murphy 2012	Partcipants did not have CHD
Murphy 2020	Systematic review/meta-analysis
NCT01941355	Ineligible study design
NCT02219815	Not relevant
NCT02235753	Trial terminated
NCT02584192	Ineligible study design
NCT02778165	Ineligible comparator
NCT03415841	Ineligible intervention
NCT03704025	Ineligible comparator
NCT04271566	Ineligible intervention
NCT04294940	Prior CR
NCT04313777	Ineligible comparator
NCT04330560	Ineligible comparator
NCT04407624	Ineligible comparator
NCT04409210	Ineligible intervention
NCT04441086	Prior CR
Ngaage 2019	Ineligible comparator
Nichols 2020	Ineligible study design
Noites 2017	Prior CR

Study	Reason for exclusion
Okhomina 2020	Ineligible study design
Oliveira 2015	Ineligible study design
Olsen 2015	Ineligible study design
Ozemek 2020	Ineligible comparator
Parsa 2018	Ineligible study design
Passaglia 2020	Ineligible intervention
Pedersen 2013	Comparator received exercise
Peschel 2007	No useful outcome data measured or reported
Pfaeffli Dale 2015	Ineligible comparator
Piestrzeniewicz 2004	Both groups received CR
Pluss 2011	Comparator received exercise
Pomeshkina 2017b	Ineligible study design
Poortaghi 2011	Both groups received CR prior to randomisation
Poortaghi 2013	Comparator received exercise
Powell 2018	Systematic review/meta-analysis
Pozehl 2018	Ineligible participant population
Pratesi 2019	Prior CR
Raghuram 2014	Ineligible comparator
Rakhshan 2019	Ineligible study design
Rauch 2016	Systematic review/meta-analysis
Regan 2020	Systematic review/meta-analysis
Ribeiro 2012	Follow-up only 8 weeks
Rideout 2012	Intervention does not contain exercise
Roviaro 1984	Non-RCT
Sadeghi 2013	Follow-up only 8 weeks
Sagar 2012	Comparator received exercise
Salzwedel 2020	Systematic review/meta-analysis
Sangster 2015	Prior CR

Study	Reason for exclusion
Sankaran 2019	Ineligible comparator
Sato 2010	Both groups received CR
Sawatzky 2014	Follow-up only 3 months
Schneider 2020	Ineligible intervention
Schwaab 2011	Non-RCT
Sen 2018	Ineligible comparator
Shabani 2010	Follow-up only 12 weeks
Shikhova 2010	Non-RCT
Siqueira-Catania 2013	Participants did not have CHD
Sokhteh 2020	Ineligible study design
Soleimannejad 2014	No outcomes of interest measured or reported
Son 2008	Ineligible study design
Stahle 1999	Follow-up only 3 months
Stammers 2015	Ineligible study design
Stenlund 2005	Follow-up only 3 months
Su 2020	Systematic review/meta-analysis
Subedi 2020	Systematic review/meta-analysis
Taguchi 2015	Ineligible study design
Takeyama 2000	Both groups received exercise
Taylor-Piliae 2020	Systematic review/meta-analysis
Thakkar 2016	Ineligible comparator
Thompson 2020	Systematic review/meta-analysis
Tokmakidis 2003	No useful outcome data measured or reported
Treskes 2020	Ineligible intervention
Turkstra 2013	Intervention does not contain exercise
Uhlemann 2012	Comparator received exercise
Ul-Haq 2019	Ineligible study design
Van Steenbergen 2020	Ineligible comparator

Study	Reason for exclusion
Vieira 2017	Prior CR
Walters 2010	Comparator received exercise
Wang J 2020	Ineligible intervention
Wang JW 2020	Ineligible intervention
Wang ZP 2019	Ineligible participant population
Wang ZQ 2019	Systematic review/meta-analysis
Wienbergen 2020	Ineligible comparator
Wong 2020	Ineligible intervention
Wood 2008	Less than 50% participants had CHD
Wosornu 1996	No useful outcome data measured or reported
Xia 2018	Systematic review/meta-analysis
Ximenes 2015	Ineligible comparator
Yamamoto 2016	Systematic review/meta-analysis
Yang 2017	Systematic review/meta-analysis
Yonezawa 2009	Non-RCT
Yudi 2020	Ineligible study design
Zetta 2011	Ineligible participant population
Zhang 2019	Systematic review/meta-analysis
Zhang 2020	Systematic review/meta-analysis
Zhao 2018	Ineligible study design
Zheng 2008	No useful outcome data measured or reported
Zhu 2013	Intervention does not include exercise
Zhu 2014	Retraction

CHD: coronary heart disease
CR: cardiac rehabilitation
RCT: randomised controlled trial
NR: not reported

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

Aronov 2006

Methods	**Study design:** NR **Country:** Russia **Follow-up:** 6 months
Participants	**Inclusion criteria:** Acute coronary event (acute myocardial infarction, unstable angina, CABG) **Exclusion criteria:** NR **N randomised:** total: 373; intervention: 188; comparator: 185
Interventions	**Intervention:** Standard therapy plus exercise programme - moderate exercise for 1 hour, 3 times per week for 1 year **Comparator:** Standard therapy
Outcomes	Not clear if any outcomes of interest were measured or reported
Notes	Unable to access full text

Belardinelli 2007

Methods	**Study design:** RCT **Country:** NR **Dates participants recruited:** January 2002 to November 2004 **Planned follow-up:** 5 years
Participants	**Inclusion criteria:** NR **Exclusion criteria:** NR **N randomised:** total: 259 **Diagnosis (% of participants):** people with CAD who underwent PCI or CABG **Age (years):** Intervention: 56±8 years; comparator: 58±8 years
Interventions	**Intervention:** Group CR combining exercise training 60% peak VO_2 3 times a week for 8 weeks with nutrition counselling and standard medication **Comparator:** No CR
Outcomes	MI, PCI, CABG, hospitalisation, cardiac death
Notes	Abstract only, with incomplete reporting of study characteristics and outcome data. Full trial report not published.

Bubnova 2015

Methods	**Study design:** RCT **Planned follow-up:** 1 year

Bubnova 2015 *(Continued)*

Participants	**N randomised:** total: 62; intervention: 31; control: 31 **Diagnosis (% of participants):** PCI (100%) **Age (years):** Intervention: 56±7 years; comparator: 53±8 years
Interventions	**Intervention:** Program of moderate intensity physical training (60 min per session, 3 times per week for 6 weeks) plus education and standard therapy **Comparator:** Educational program and standard therapy
Outcomes	"Cardiovascular events" (not clear what these include)
Notes	Conference abstract; triallists did not respond to repeated requests for further information

Chen 2020

Methods	**Study design:** RCT
Participants	**Inclusion criteria:** Participants with a clinical diagnosis of AMI, aged 18 to 80 years, performed PCI, and signed a consent form. **Exclusion criteria**: Current participation in any other behavioural or pharmacological study or instructor-led exercise program, cardiogenic shock, severe heart failure (NYHA class IV or LVEF ≤ 35%), malignant arrhythmia (ventricular fibrillation, ventricular tachycardia, and frequent ventricular premature beats), or active bleeding. People with underlying conditions such as bone and joint disease or nervous system disorders that would impede full participation in the study and unavailability during the study period.
Interventions	**Intervention:** Baduanjin sequential therapy (BST) beginning 2 days after surgery (30 min/session, twice per day, 3 days). After discharge, participants did standing Baduanjin exercises 30 min/session, five times per week for 24 weeks. Participants were provided picture-based educational brochure, and telephone follow-ups were provided to reinforce participants' adherence to the follow-up assessments. **Comparator:** requested to maintain original habit of lifestyle
Outcomes	HRQoL
Notes	The authors were contacted to clarify an unclear section within the methods describing the treatment received by the control group, but no response received.

Ghroubi 2012

Methods	**Study design:** RCT **Country:** NR **Dates participants recruited:** NR **Planned follow-up:** 2 years
Participants	**Inclusion criteria:** people with MI who underwent coronary stenting **Exclusion criteria:** NR **N randomised:** total: 68; intervention: 30; comparator: 38

Ghroubi 2012 *(Continued)*

	Diagnosis (% of participants): post-coronary stenting after myocardial infraction
Interventions	Cardiac rehabilitation programme not described
Outcomes	HRQoL
Notes	The authors of this conference abstract did not reply to repeated requests for an update on the status of this study.

Lubinskaya 2014

Methods	**Study design:** RCT **Planned follow-up:** 2 years
Participants	**Inclusion criteria:** NR **Exclusion criteria:** NR **N randomised:** total: 200; intervention: 92; control: 108 **Diagnosis (% of participants):** CABG (100%) **Mean age:** 57.7 years
Interventions	**Intervention:** 2-year comprehensive rehabilitation programme with cardiologist supervision (1, 3, and every 6 months), intermediate telephone/internet contact (9, 15, 21 months post-surgery), controlled exercise training (every 6 months) and self-controlled exercise training (daily morning exercise and walking), psychologist counselling, education programme (60 min every 6 months). **Comparator:** standard care
Outcomes	Treatment costs
Notes	Conference abstract; unable to locate full text despite contacting triallists

Marques-Sule 2016

Methods	**Study design:** RCT **Planned follow-up:** 24 weeks
Participants	**Inclusion criteria:** NR **Exclusion criteria:** NR **N randomised:** total: 90; intervention: 45; control: 45 **Diagnosis (% of participants):** ACS (100%) **Mean age:** intervention: 69.2±4.1 years; comparator: 69.2±5.6 years
Interventions	**Intervention:** Exercise sessions (8 cardiovascular exercises interrupted by 1 minute active breaks), 1 session per week for 2 months **Comparator:** NR

Marques-Sule 2016 *(Continued)*

Outcomes	No outcomes of interest reported in either conference abstract
Notes	Unable to locate full text

NCT00725088

Methods	**Study design:** RCT **Follow-up:** 1 year
Participants	**Inclusion criteria:** Clinical diagnosis of ST-elevated MI, heart function class I-II (Killip classification), agree to take cardiopulmonary exercise testing before discharge, signature of informed consent document **Exclusion criteria:** History of MI, acute MI with severe complications (pulmonary edema, severe cardiac arrhythmia or cardiogenic shock), atrial fibrillation, other severe diseases such as HIV infection, malignant tumour or chronic diseases of liver kidney or pulmonary, not capable of exercise training
Interventions	**Intervention:** exercise training **Comparator:** NR
Outcomes	Cardiac mortality, MI, revascularisation, hospitalisation
Notes	Triallists contacted for update on status of study, but no response received

Pater 2000

Methods	**Study design**: RCT **Country:** Norway **Follow-up:** 3 years
Participants	**Inclusion criteria:** • Males and females aged 40 to 85 years, • Unequivocal hospital-verified, definite AMI less than 3 months ago • People with a recent ACS (that is, established CHD with a stabilised condition after a recent unstable episode) • PTCA patients (more than 4 weeks after a PTCA) • CABG patients (more than 4 weeks after a CABG) • Ambulatory patients who have signed a declaration of consent **Exclusion criteria:** • Unstable angina pectoris • Scheduled angiography • Clinically significant heart failure • Severe hypertension • Symptoms of orthostatic hypertension or a supine systolic blood pressure of 90 mmHg or lower • Severe arrhythmias persisting after the acute phase of the MI • Psychoneurotic disorders (depression and/or anxiety)

Pater 2000 *(Continued)*

	• Severe obstructive airway disease with permanent respiratory insufficiency • Uncontrolled diabetic mellitus • Severe orthopaedic disability • Serum creatinine more than double the local upper normal limit • Alanine amino-transferase or aspartate amino-transferase more than three times the local upper limit (in the context of known liver disease) • Presence of any condition that limits life expectancy (e.g. cancer or haematological diseases) • Problems expected with compliance or follow-up • Participation in another trial or study during the past 30 days • Stroke with severe physical disability
Interventions	**Intervention:** structured secondary prevention programme including patient education, brief counselling, and systematic physical training tailored to each individual. The exercise programme consists of 8 weeks of supervised outpatient physical training. **Comparator:** conventional care
Outcomes	HRQoL
Notes	Authors did not respond to repeated requests for study update.

Pomeshkina 2014

Methods	**Study design**: RCT **Follow-up:** 1 year
Participants	**Inclusion criteria:** NR **Exclusion criteria:** NR **N randomised:** total: 64; intervention: 29; control: 35 **Diagnosis (% of participants):** CABG (100%) **Mean age:** 54.7±4.6 years
Interventions	**Intervention:** Common medical rehabilitation programme with long-term (3 months) cycling training **Comparator:** Common medical rehabilitation (medication, lifestyle modifications)
Outcomes	Unclear if any outcomes of interest were measured or reported
Notes	Triallists did not respond to requests for study updates

Rymuza 2019

Methods	**Study design:** RCT **Follow-up:** 12 months
Participants	**Inclusion criteria:** participants with ACS, age > 75 years, after PCI **Exclusion criteria:** NR

Rymuza 2019 *(Continued)*

	N randomised: total: 51; intervention: 25; control: 26
	Diagnosis (% of participants): PCI (100%)
	Mean age: 80 years
Interventions	**Intervention:** training three times per week for 2 months
	Comparator: received general recommendations for activity
Outcomes	HRQoL
Notes	Triallists did not respond to repeated requests for study updates

Sin'kova 2014

Methods	**Study design:** RCT
	Follow-up: NR
Participants	**Inclusion criteria:** participants surviving MI
	Exclusion criteria: NR
	N randomised: total: 110; intervention: 53; control: 57
	Diagnosis (% of participants): NR
	Mean age: 58.3 ± 9.8 years
Interventions	**Intervention:** Walking at a speed corresponding to 60% maximal heart rate
	Comparator: NR
Outcomes	Costs
Notes	Unable to contact triallists for further information

Von Roeder 2011

Methods	**Study design:** RCT
	Country: NR
	Dates participants recruited: NR
	Planned follow-up: 2 years
Participants	**Inclusion criteria:** participants with CAD and proven exercise-induced ischaemia
	Exclusion criteria: NR
	N randomised: total: 103; intervention: 57; comparator: 46
	Age (years): NR
	Percentage male: NR

Von Roeder 2011 *(Continued)*

	Ethnicity: NR
Interventions	**Intervention:** regular exercise training **Comparator:** PCI/stenting
Outcomes	Mortality
Notes	The authors of this conference abstract did not reply to repeated requests for an update on the status of this study.

Walther 2010

Methods	**Study design:** RCT **Country:** NR **Dates participants recruited:** NR **Planned follow-up:** 2 years
Participants	**Inclusion criteria:** Male participants with indication for elective CABG **Exclusion criteria:** NR **N randomised:** total: 47; intervention: 23; comparator: 24 **Age (mean ± SD):** 64.3 ± 7 years **Percentage male:** 100% **Ethnicity:** NR
Interventions	**Intervention:** four-week pre-operative endurance training course **Comparator:** non-active control
Outcomes	HRQoL and clinical outcomes
Notes	The authors of this conference abstract did not reply to repeated requests for an update on the status of this study.

ACS: acute coronary syndrome
CABG: coronary artery bypass graft
CAD: coronary artery disease
CHD: coronary heart disease
CR: cardiac rehabilitation
HRQol: health-related quality of life
MI: myocardial infarction
N: number
NR: not reported
PCI: percutaneous coronary intervention
PTCA: percutaneous transluminal coronary angioplasty
RCT: randomised controlled trial

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

ACTRN12616001204437

Study name	Tai Chi for stress and cardiovascular function in patients with coronary heart disease and/or hypertension: a randomised controlled trial
Methods	RCT with waiting-list control
Participants	**Inclusion criteria:** (1) Equal to or greater than 40 years of age, regardless of gender; (2) With documented diagnosis of CHD (myocardial infarction, angina or revascularisation) with severity of angina class I to II according to the Canadian Cardiovascular Society functional classification, and/or with established diagnosis of hypertension according to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; (3) Ability to perform prescribed Tai Chi program; (4) Willing to complete the 24-week Tai Chi intervention; (5) Not practicing Tai Chi in the past 6 months; (6) Ability to speak and read Chinese or English fluently; (7) Willing to sign a written informed consent. **Exclusion criteria:** (1) Pregnancy (2) Previous or current psychological disorders not associated with depression or anxiety (3) End-stage congestive heart failure (4) Permanent bed-bound status (5) Unstable abdominal, thoracic or cerebral aneurysm (6) Acute myocarditis, pericarditis, pulmonary embolus or pulmonary infarction (7) Significant limitation of physical activity for reasons other than CHD (8) Participation in a clinical trial for an experimental drug within the last 30 days before the study
Interventions	**Intervention:** the intervention group will be offered a standardised Tai Chi intervention over a period of 24 weeks, consisting of a 12-week intensive Tai Chi intervention and a 12-week sustained Tai Chi intervention. **Comparator:** participants assigned to the waiting-list control group will be instructed to maintain their routine activities and not to begin any new exercise programs during their study participation. These participants will be offered an equivalent 12-week intensive Tai Chi intervention and 12-week sustained Tai Chi intervention at the termination of the study, provided the Tai Chi intervention in the treatment is proved to be safe (no severe adverse events directly associated with Tai Chi).
Outcomes	HRQoL, adverse events
Starting date	28 August 2015
Contact information	d.chang@westernsydney.edu.au
Notes	

CTRI/2017/07/008951

Study name	Efficacy of YOGA in Indian patients with coronary artery disease
Methods	RCT
Participants	**Inclusion criteria:** 1. All adults between 30 and 70 years 2. People with acute coronary syndrome who have undergone percutaneous coronary intervention within 2 weeks or 3. People with stable coronary artery disease who have undergone percutaneous coronary intervention in the last 2 weeks 4. People who are willing and able to participate **Exclusion criteria:** 1. Severe LV dysfunction 2. Unstable arrhythmia 3. Active decompensated heart failure 4. Uncontrolled hypertension (> 180/110) 5. Contraindications to yoga 7. Contraindications to exercise testing or training 8. NYHA IV 9. Incomplete revascularisation
Interventions	**Intervention:** participants undergoing PCI with routine advice on discharge and enhanced usual care(physiotherapy, medications and lifestyle modifications) will be taught yoga, based on the module in the first week of each phase. On non-class days, participants will be motivated to practice yoga sessions at home every day, and their compliance will be ensured telephonically and through a written log. The participants will be encouraged to practice until the end of the follow-up period (3 years). **Comparator:** participants will be on enhanced usual care after PCI.
Outcomes	MACCE, HRQoL
Starting date	03 July 2017
Contact information	drgautamsharma12@gmail.com
Notes	

CTRI/2017/10/009981

Study name	Efficacy of yoga-based cardiac rehabilitation on clinical outcomes in post CABG patients: a randomized controlled trial.
Methods	RCT
Participants	**Inclusion criteria:** 1. People willing and able to participate 2. All adults between 35 and 65 years of age

CTRI/2017/10/009981 *(Continued)*

	3. People established with double or triple vessel disease planned for elective CABG d. People with uncomplicated peri-operative course, who are able to perform yoga **Exclusion criteria:** a. Emergency CABG b. CABG with valve replacement surgeries c. LVEF d. Acute and chronic renal failure with or without dialysis e. Regular yoga practitioners f. Physical disabilities precluding yoga practice g. Neuro-psychiatric illness h. People already exposed to yoga
Interventions	**Intervention:** yoga plus conventional medical management which includes physiotherapy, lifestyle modifications and medications **Comparator:** conventional medical management
Outcomes	HRQoL, MACCE
Starting date	10/10/2017
Contact information	airanbalram@gmail.com
Notes	

CTRI/2019/06/019948

Study name	Effect of cardiac rehabilitation in patients undergone myocardial infarction and percutaneous coronary intervention
Methods	RCT
Participants	**Inclusion criteria:** 1. 18 to 80 years of age 2. Diagnosed myocardial infarction who have undergone percutaneous coronary intervention not at risk due to other comorbidities. 3. Willing to give informed consent 4. Individuals with acute myocardial infarction 5. Individuals with New York Heart Association (NYHA) functional class I, II & III symptoms **Exclusion criteria:** 1. Participants with medical conditions which could put them at risk during physical activity testing or training (e.g. angina), or conditions that could limit the participant's ability to exercise (e.g. severe orthopaedic or neurologic impairments) 2. Individuals with prior myocardial infarction
Interventions	**Intervention:** adapted phase II and phase III of cardiac rehabilitation programme with components of physical activity, education on coronary artery disease and heart-healthy living **Comparator:** participants will not receive any supervised physical activity training. Participants will receive routine care for myocardial infarction after undergoing percutaneous coronary intervention according to current guidelines.

CTRI/2019/06/019948 *(Continued)*

Outcomes	HRQoL, cost effectiveness, all-cause mortality
Starting date	02 July 2019
Contact information	dr.kunjan2human@gmail.com
Notes	

NCT00756379

Study name	Century Trial, a randomized lifestyle modification study for management of stable coronary artery disease (Century)
Methods	RCT (single centre)

Participants	**Inclusion Criteria:**
	• Participants must be competent to provide written informed consent.
	• Participants must sign an Institutional Review Board (IRB) approved Informed Consent Form (ICF) and HIPAA Authorization prior to the initiation of any study procedures.
	• Men and women age ≥ 40
	• Appropriate indications for stress perfusion testing:
	  * Suspected CAD:
	  * Men with any chest pain syndrome and two other risk factors
	  * Women > 50 years old with any chest pain syndrome and two other risk factors
	  * Asymptomatic men and women > 50 years with at least three other risk factors or coronary calcium agatston score > 400.
	  * Diabetic men and women and two other risk factors
	• Documented known CAD:
	  * Men and women with asymptomatic or stable symptoms and known CAD by abnormal catheterisation or prior Single Photon Emission Computed Tomography (SPECT) without revascularisation after > 2 years to evaluate worsening disease; or
	  * Men and women with worsening symptoms and known CAD by abnormal catheterisation or prior SPECT/ Positron emission tomography (PET) without revascularisation;
	  * Men and women with chest pain syndrome and previous revascularisation
	• Asymptomatic men and women > 5 years after coronary artery bypass graft surgery (CABG) or > 2 years after PCI
	• Risk factors: diabetes, current or recent cigarette smoking (within the last 12 months), LDL >130, low HDL < 50 women, HDL < 45 men, history of metabolic syndrome, hypertension (systolic blood pressure (SPB) > 140), family history of premature (< 60 year) CAD, atherosclerotic carotid artery disease OR atherosclerotic peripheral vascular disease (APVD) as defined by ankle-brachial index below 0.9 and/or by abnormal duplex ultrasound, CT angiography, magnetic resonance angiography (MRA) or conventional invasive angiogram or previous revascularisation procedure.
	• Framingham's high risk criteria refers to presence of diabetes mellitus with the limitation described above (c) or 10 year absolute coronary heart disease (CHD) risk of > or = 20%.
	• Chest pain is defined as 'Typical angina' if Exertional + Retrosternal + relieved with rest or sublingual nitroglycerin (NTG), 'Atypical angina' if only two of the above criteria are present and 'Non-anginal' if one or none of the above are present.
	
	Exclusion criteria:
	• Age < 40
	• Low pretest likelihood of CAD (= not meeting the above criteria)
	• Unstable angina high risk (dynamic ST-Twave ECG changes and/or elevated troponin)
	• Recent MI (< 4 weeks)

NCT00756379 *(Continued)*

	• Recent stroke (< 4 weeks) • CABG or percutaneous coronary intervention (PCI) within the last 6 months • Severe renal dysfunction as defined by creatinine > 2.0 mg/dL • Active liver disease or hepatic dysfunction, AST or ALT > x 2 the upper limit of normal (ULN) • Concomitant valvular heart disease • Left ventricular ejection fraction (LVEF) <30% • Severe systemic hypertension defined as systolic blood pressure (SBP) > 200 mmHg • Symptomatic sustained or non-sustained ventricular tachycardia • Morbid obesity defined by body mass index (BMI) > 35 • Severe disability to prevent therapeutic exercise not expected to resolve within 6 months • Major non-cardiac comorbidity limiting survival or social situation/condition that, in the opinion of the investigator, will preclude the patient from participation in the study follow-up. • Concurrent or prior (within last 30 days) participation in other research studies using investigational drugs or devices.
Interventions	**Intervention:** "P.E.T. guided comprehensive therapy program. The study intervention is comprehensive therapy program for risk factor modification. The comprehensive program of atherosclerotic risk factor modification involves treatment to target lipid levels, blood pressure and diabetes control, smoking cessation, very low fat diet and aerobic exercise program. This is in addition to standard current medical therapy as provided by primary physician. No experimental medications or procedures will be used." "During the 5 year follow-up they will be educated and guided toward a healthy lifestyle by a dietician, an exercise physiologist/cardiovascular physician specialist." **Comparator:** "Current standard of care medical management as provided by primary physician."
Outcomes	Mortality, non-fatal MI, revascularisation, total cost
Starting date	March 2009
Contact information	K.Lance Gould, Professor, Internal Medicine, Cardiology, University of Texas Health Science Center, Houston
Notes	

NCT02025257

Study name	Effects of exercise in patients with coronary artery disease aged 80 years or older
Methods	RCT
Participants	**Inclusion criteria:** clinical diagnosis of acute CAD, aged 80 years or older. **Exclusion criteria:** inability to understand or speak Swedish, serious physical or psychological disease interfering with participation in an exercise intervention, patients are already exercising three times or more/week
Interventions	**Intervention:** exercise **Comparator:** NR
Outcomes	HRQoL

NCT02025257 *(Continued)*

Starting date	December 2013
Contact information	Maria Bäck, PhD maria.m.back@vgregion.se http://clinicaltrials.gov/show/NCT02025257
Notes	

NCT03102346

Study name	efficAcy and Safety of Home-baSed Cardiac rehabIlitation in ChineSe Revascularized patienTs (ASSIST)
Methods	RCT
Participants	**Inclusion criteria:** 1. Age range from 30 to 80. 2. Coronary artery disease, revascularised with stent deployment. 3. New York Heart Association (NYHA) classification Class I-III. 4. Good cognitive level. 5. Ability to perform aerobic exercise. 6. Understand and be able to use a mobile smart phone by himself or with help of family members. 7. Signature of informed consent. The informed consent will be valid for the duration of the trial or until the subject withdraws. **Exclusion criteria:** 1. Presence of malignant arrhythmias such as ventricular fibrillation outside the acute phase of acute myocardial infarction (AMI) (> 24 h after AMI), ventricular tachycardia, Atrioventricular block of 2nd degree and 3rd degree, atrial fibrillation (FA) in patients with Wolf Parkinson White, fibrillation or paroxysmal atrial flutter with response ventricular quickly and haemodynamic deterioration, premature ventricular contractions increases during exertion, paroxysmal supraventricular tachycardia uncontrolled. 2. Hypotensive response to exercise. 3. Acute myocardial infarction within 2 weeks. 4. Poorly controlled hypertension baseline, hyperglycaemia, respiratory failure. 5. Severe pulmonary hypertension. 6. Acute phase of heart failure. 7. Pathology of musculoskeletal, neurological or breathing that impair the ability of prolonged ambulation. 8. Pregnant women. 9. Subjects unable to give informed consent.
Interventions	**Intervention:** home-based cardiac rehabilitation **Comparator:** no instructed exercise training
Outcomes	MACCE, hospitalisation, HRQoL
Starting date	09 November 2017
Contact information	crystalma_301@126.com

NCT03102346 *(Continued)*

Notes	

NCT03375944

Study name	Utilisation of Telemedicine in Optimal Cardiac Rehabilitation Program in Patients After Myocardial Revascularization (RESTORE)
Methods	RCT
Participants	**Inclusion criteria:** • age over 18 and below 70 • completed revascularization in participants with stable or unstable angina or after myocardial infarction without ST-segment elevation (NSTEMI) • in participants with suspected myocardial scars, MRI will be recommended to confirm myocardial viability • eligibility to participate in a program of early cardiac rehabilitation • signed informed consent form • the ability to use telerehabilitation system **Exclusion criteria:** • acute myocardial infarction with ST segment elevation/new onset of left bundle branch block (LBBB) • suboptimal (not completed) revascularisation • ejection fraction < 40%. • acute heart failure (Killip IV) at the time of admission to the hospital • dual antiplatelet therapy can not be maintained for 1 year after PCI • haemorrhagic stroke in the past • ischaemic stroke or transient ischaemia in previous 6 weeks • platelet count < 100,000 / mm^3 • chronic renal failure with creatinine clearance < 30mL / min / 1.73 m^2 • planned surgery • pregnancy or planned pregnancies • expected life expectancy less than 3 years after enrolment
Interventions	**Intervention:** cardiac supervision and rehabilitation - optimal, continuous and regularly controlled tele-rehabilitation, based on exercise training, intensive dietary and educational program focused on lifestyle and risk factor modification. **Comparator:** cardiac supervision
Outcomes	Mortality, cardiovascular events
Starting date	March 2018
Contact information	Krzysztof Milewski; kpmilewski@gmail.com
Notes	

NCT03584828

Study name	Tele-Cardiac Rehabilitation Program
Methods	RCT
Participants	**Inclusion criteria:** • guideline-based and Israeli Health Basket approved indications for cardiac rehabilitation yet participant declines to participate in centre-based cardiac rehabilitation due to non-medical reasons such as: distance, service availability in participants' living area, time constraints and other logistic or sociocultural barriers; • age ≥ 21 years; • compatible smartphone (android or iOS) with internet connection; • willing and able to comply with study protocol; • able and willing to follow the personalised exercise prescription, use wearable technology and smartphone app, and upload data via personal smartphone. **Exclusion criteria:** • any unresolved cardiac condition associated with significantly increased risk during outpatient activity (clinically significant ischaemia, unresolved arrhythmia, high falling risk, etc.); • end-stage/NYHA 4 or unstable heart failure (clinical) or unresolved significant arrhythmia (i.e. rapid atrial fibrillation); • LVEF ≤ 35% without ICD/ CRTD; • significant neurological or cognitive impairment or markedly unstable gait /high falling risk; • women of child-bearing potential; • ACS within 30 days prior to screening, or having undergone cardiac surgery within 30 days prior to screening; • inability to perform a stress test due to physical limitations; • severe angina pectoris as defined by Canadian Cardiovascular Society (CCS) Angina Score > 2; • pulmonary disease of severity greater than mild (COPD, asthma, interstitial lung disease (ILD), connective tissue disease (CTD) with lung involvement) or chronic pulmonary thromboembolic disease (CTED)); • severe orthopedic limitations; • active myocarditis, constrictive pericarditis, restrictive or hypertrophic cardiomyopathy; • severe aortic or mitral stenosis; • significant anaemia (Hb < 10 mg/dL); • known drug or alcohol dependence or any other factors which will interfere with the study conduct or interpretation of the results, or in the opinion of the investigator, are not suitable to participate; • any illness which reduces life expectancy to less than 1 year from screening.
Interventions	**Intervention:** "The Tele-rehab arm will receive an exercise prescription and execution will be assessed and periodically adjusted in accordance to data received from the wearable device. Intensity and type of exercise will be moderate and will comply with exercise recommendations provided by ESC guidelines. A dedicated application will be installed on the mobile phone for patients in the research group and they will receive a smart sports watch." "Additionally, in the intervention arm, we will provide psychological support, dietary intervention and disease management services that complement the structured physical activity - all by innovative smartphone applications and smart wearable devices" **Comparator:** "The usual care arm will receive general recommendations for a healthy and active lifestyle and community cardiologist and primary care physician according to local guidelines."
Outcomes	hospitalisation, mortality, HRQoL

NCT03584828 *(Continued)*

Starting date	July 2018
Contact information	Dr. Robert Klempfner Heart Rehabilitation Institute, Head, Cardiovascular Prevention and Rehabilitation Institute, Sheba Medical Center, Israel, Sheba Medical Center
Notes	

NCT03905187

Study name	Stress Management Modified Cardiac Rehabilitation in Patients After Acute Myocardial Infarction or Heart Failure
Methods	RCT
Participants	**Inclusion criteria:** Participants aged 18 to 80 years old with a diagnosis of AMI (include ST segment elevated myocardial infarction and non-ST segment elevated myocardial infarction) or heart failure. **Exclusion criteria:** Uncontrolled tachycardia (heart rate at rest > 120 bpm). Uncontrolled polypnoea (breath rate at rest > 30 breath per minute. Uncontrolled respiratory failure (SPO2 ≤ 90%). Uncontrolled hypertension (pre-exercise SBP > 180 mmHg or DBP > 110 mmHg). Weight change in 72 hours > 1.8kg. Uncontrolled hyperglycaemia (random blood glucose > 18 mmol/L). Uncontrolled malignant arrhythmia with haemodynamic instability. Unoperated pseudoaneurysm. Artery dissection. Uncontrolled septic shock and septicopyaemia. Unoperated severe valvular heart disease or acute phase of heart failure caused by myocardial heart disease. Nervous system disease, motor system diseases and rheumatic diseases considered possibly worsened by exercise. Uncooperation of the participants.
Interventions	**Intervention 1:** Modified CR - cardiac rehabilitation including stress management, exercise and education. **Intervention 2:** Traditional CR - including education and exercise. **Comparator:** Education only (control group)
Outcomes	HRQoL, rehospitalisation, MACE
Starting date	April 2019
Contact information	crystalma@126.com
Notes	

NCT03978130

Study name	Rehabilitation at Home Using Mobile Health in Older Adults after Hospitalization for Ischemic Heart Disease (RESILIENT)
Methods	Multicentre RCT
Participants	**Inclusion criteria:**

NCT03978130 *(Continued)*

	1. Age ≥ 65 years. 2. Currently hospitalised for AMI, PCI, or CABG, or hospitalised for AMI, PCI or CABG within prior 2 weeks. 3. Capable of self-consent. 4. Understands and is able to perform study procedures (i.e. 6-minute walk test, use mHealth software in English or Spanish). **Exclusion criteria:** 1. Non-ambulatory. 2. Moderate or severe cognitive impairment. 3. Unable/unwilling to consent. 4. PCI-related groin hematoma that precludes brisk walking. 5. Incarcerated. 6. Unable to use mHealth software in English or Spanish. 7. Severe osteoarthritis, or joint replacement within last 3 months. 8. Parkinson's disease or other progressive movement disorder. 9. Regular use of walker for ambulation. 10. Projected life expectancy < 3 months. 11. Clinical judgment concerning other safety or non-adherence issues. 12. Participants admitted from long-term care facility. 13. Currently listed for heart transplant. 14. Left ventricular assist device recipient. 15. Completion of ambulatory cardiac rehabilitation program within prior 3 months.
Interventions	**Intervention:** mHealth-CR: participants receive 3 components for their home activity: (1) communication with exercise therapist (in-hospital assessment/counselling followed by regular communication post-discharge), (2) mHealth-CR software, and (3) wearable activity-monitoring device. **Comparator:** usual care
Outcomes	HRQoL, hospital readmissions, mortality
Starting date	January 2020
Contact information	resilient@nyulangone.org
Notes	

NCT04425057

Study name	Effect of a High Intensity Interval Training in Older Adults With Coronary Artery Disease
Methods	RCT
Participants	**Inclusion criteria:** • diagnosed with coronary artery disease • discharged from hospital, less than 2 months **Exclusion criteria:**

NCT04425057 *(Continued)*

	• not able to move by themselves
Interventions	**Intervention:** physiotherapy program during two months: interval training at a high intensity, including a warm-up and a cool-down. Aerobic exercises, resistance exercises, stretching. **Comparator:** no physiotherapy.
Outcomes	HRQoL (SF-36)
Starting date	October 2012
Contact information	Elena Marques-Sule, PhD, PT, University of Valencia
Notes	

NCT04438356

Study name	M-Health Care for Patients After AMI on Disease Perception, Self-Efficacy, Anxiety and Cardio-Respiratory Fitness
Methods	RCT (waiting-list control)
Participants	**Inclusion criteria:** • Taiwanese, understand Chinese • Participants who are over 20 years old and have AMI (including ST segment ascending and non-ST segment ascending), diagnosed by percutaneous coronary intervention and without complications within 30±5 days, the left ventricular injection rate is greater than 40% • Ability and willingness to provide informed consent • Have a smartphone • Can receive and send smartphone messages **Exclusion criteria:** • Those who can't express their wishes clearly (such as mental dysfunction) • Mental disorder • People who participate in other research projects • Planned coronary artery bypass surgery or other diseases that require continuous heart care • Abuse of alcohol or narcotics • Left ventricular ejection fraction (LVEF) is less than 40%
Interventions	**Intervention:** M-Health app to remind participants of the walking frequency and time, and use Garmin monitoring bracelet to record daily walking steps. App content also includes knowledge about acute myocardial infarction, self-care and anxiety. **Control:** Waiting-list control for 3 months, then receive the same M-Health intervention
Outcomes	
Starting date	22 July 2020
Contact information	Hui-Hsun Chiang: sheisvivian@gmail.com

NCT04438356 *(Continued)*

Notes	

NCT04511182

Study name	Early Individualized-Exercise Based Cardiac Rehabilitation Programs in Patients With Acute Myocardial Infarction
Methods	RCT
Participants	**Inclusion criteria:** 1. Acute myocardial infarction (AMI) within 1 month prior to recruitment. 2. Complete revascularisation. 3. Men or non-pregnant women aged from 18 to 80 years. **Exclusion criteria:** 1. Uncontrolled hypertension (systolic blood pressure/diastolic blood pressure > 160/100 mmHg), or symptomatic hypotension. 2. Significant resting electrocardiogram abnormalities (left bundle branch block, non-specific intraventricular conduction delay, left ventricular hypertrophy, resting ST-segment depression), life-threatening cardiac arrhythmias. 3. Acute myocarditis, pericarditis or acute systemic illness. 4. Those who are assessed by the doctor as high-risk. 5. Pacemaker or implantable cardioverter defibrillator. 6. Any contraindication to exercise testing or exercise training or inability to complete a CPET. 7. Life-threatening diseases with limited life expectancy < 3 year. 8. Uncontrolled unstable angina pectoris. 9. Significant valvular disease (mitral stenosis, moderate to severe mitral insufficiency, aortic stenosis, or aortic insufficiency, severe mitral / aortic regurgitation). 10. Severe mental or cognitive impairment. 11. Inability to follow the procedures of the study.
Interventions	**Intervention:** exercise intervention group. Participants will receive standard medications plus exercise based CR. Education covering topics related to AMI and exercise for AMI will be implemented and any consultations on exercise prescription and disease management will be explained by a cardiac rehabilitation team consisting of cardiologists, cardiology nurses and physiotherapists. **Comparator:** participants will receive standard medications according to national guidelines, as well as education and consultations as intervention group. However, no exercise prescription is given.
Outcomes	HRQoL (SF-36), MACE
Starting date	1 February 2021
Contact information	Qin Shao: shaoqindr@126.com
Notes	

NCT04858503	
Study name	An Internet-based Cardiac Rehabilitation Enhancement (i-CARE) Intervention to Support Self-care of Patients With Coronary Artery Disease
Methods	RCT
Participants	**Inclusion criteria:** • ≥ 18 years of age • living in the community • own a smartphone with internet access • communicable in Cantonese • type in Chinese or English • with a confirmed diagnosis of CAD **Exclusion criteria:** • enrolled to a structured centre-based or home-based cardiac rehabilitation program • psychiatric problems • impaired cognitive functioning (i.e. Abbreviated Mental Test ≤ 6) • terminal disease with life expectancy < 1 year
Interventions	**Intervention:** participants in the intervention group will receive a 12-week i-CARE intervention, which will be designed to cover the core elements of CAD self-care: self-care maintenance, self-care monitoring and self-care management. The intervention will comprise: 1) a single individualised face-to-face session, and 2) an internet-based intervention through a mobile application. Various behaviour change techniques will be used to increase the self-efficacy of CAD patients in enacting self-care behaviours. **Comparator:** participants will receive conventional care as arranged by hospital or community centres.
Outcomes	cardiovascular events, mortality, HRQoL
Starting date	May 2021
Contact information	Dr. Polly Wai-Chi Li, The University of Hong Kong pwcli@hku.hk
Notes	

ACS: acute coronary syndrome
AMI: acute myocardial infarction
APVD: atherosclerotic peripheral vascular disease
CABG: coronary artery bypass graft
COPD: chronic obstructive pulmonary disease
CPET: cardiopulmonary exercise test
CRTD: cardiac resynchronization therapy defibrillator
CTED: chronic pulmonary thromboembolic disease
DBP: diastolic blood pressure
HDL: high-density lipoprotein
HRQoL: health-related quality of life
ICD: implantable cardioverter defibrillator
LDL: low-density lipoprotein
LV: left-ventricular
LVEF: left ventricular ejection fraction
MACCE: major adverse cardiac and cerebrovascular events
MACE: major adverse coronary event
NYHA: New York Heart Association

PCI: percutaneous coronary intervention
RCT: randomised controlled trial
SBP: systolic blood pressure

DATA AND ANALYSES

Comparison 1. Exercise-based rehabilitation versus control

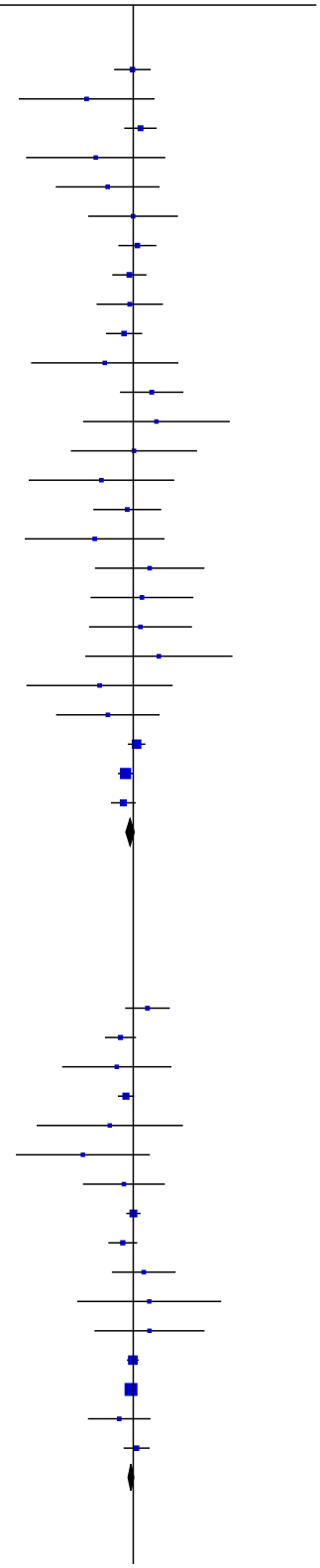
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 All-cause mortality	47		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1.1 Follow-up of 6 to 12 months	25	8823	Risk Ratio (M-H, Random, 95% CI)	0.87 [0.73, 1.04]
1.1.2 Follow-up of > 12 to 36 months	16	11073	Risk Ratio (M-H, Random, 95% CI)	0.90 [0.80, 1.02]
1.1.3 Follow-up longer than 3 years	11	3828	Risk Ratio (M-H, Random, 95% CI)	0.91 [0.75, 1.10]
1.2 Cardiovascular mortality	26		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.2.1 Follow-up of 6 to 12 months	15	5360	Risk Ratio (M-H, Random, 95% CI)	0.88 [0.68, 1.14]
1.2.2 Follow-up of > 12 months to 36 months	5	3614	Risk Ratio (M-H, Random, 95% CI)	0.77 [0.63, 0.93]
1.2.3 Follow-up of longer than 3 years	8	1392	Risk Ratio (M-H, Random, 95% CI)	0.58 [0.43, 0.78]
1.3 Fatal and/or nonfatal MI	39		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.3.1 Follow-up of 6 to 12 months	22	7423	Risk Ratio (M-H, Random, 95% CI)	0.72 [0.55, 0.93]
1.3.2 Follow-up of > 12 to 36 months	12	9565	Risk Ratio (M-H, Random, 95% CI)	1.07 [0.91, 1.27]
1.3.3 Follow-up of longer than 3 years	10	1560	Risk Ratio (M-H, Random, 95% CI)	0.67 [0.50, 0.90]
1.4 CABG	29		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.4.1 Follow-up of 6 to 12 months	20	4473	Risk Ratio (M-H, Random, 95% CI)	0.99 [0.78, 1.27]
1.4.2 Follow-up of > 12 to 36 months	9	2826	Risk Ratio (M-H, Random, 95% CI)	0.97 [0.77, 1.23]
1.4.3 Follow-up of longer than 3 years	4	675	Risk Ratio (M-H, Random, 95% CI)	0.66 [0.34, 1.27]
1.5 PCI	18		Risk Ratio (M-H, Random, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.5.1 Follow-up of 6 to 12 months	13	3465	Risk Ratio (M-H, Random, 95% CI)	0.86 [0.63, 1.19]
1.5.2 Follow-up of > 12 to 36 months	6	1983	Risk Ratio (M-H, Random, 95% CI)	0.96 [0.69, 1.35]
1.5.3 Follow-up of longer than 3 years	3	567	Risk Ratio (M-H, Random, 95% CI)	0.76 [0.48, 1.20]
1.6 All-cause hospital admissions	22		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.6.1 Follow-up of 6 to 12 months	14	2030	Risk Ratio (M-H, Random, 95% CI)	0.58 [0.43, 0.77]
1.6.2 Follow-up of > 12 to 36 months	9	5995	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.82, 1.03]
1.7 Cardiovascular hospital admissions	8		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.7.1 Follow-up of 6 to 12 months	6	1087	Risk Ratio (M-H, Random, 95% CI)	0.80 [0.41, 1.59]
1.7.2 Follow up of >12 to 36 months	3	943	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.76, 1.12]
1.8 HRQoL SF-36 summary scores at 6 to 12 months follow up	6		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.8.1 Physical component score	6	1741	Mean Difference (IV, Random, 95% CI)	1.70 [-0.08, 3.47]
1.8.2 Mental component score	6	1741	Mean Difference (IV, Random, 95% CI)	2.14 [1.07, 3.22]
1.9 HRQoL SF-36 8 domains at 6 to 12 months follow up	8		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.9.1 Physical functioning	8	2756	Mean Difference (IV, Random, 95% CI)	8.47 [3.69, 13.24]
1.9.2 Physical performance	8	2756	Mean Difference (IV, Random, 95% CI)	8.08 [2.89, 13.27]
1.9.3 Bodily pain	8	2756	Mean Difference (IV, Random, 95% CI)	-0.06 [-8.97, 8.84]
1.9.4 General health	8	2756	Mean Difference (IV, Random, 95% CI)	5.66 [2.08, 9.25]
1.9.5 Vitality	7	2638	Mean Difference (IV, Random, 95% CI)	5.78 [1.89, 9.67]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.9.6 Social functioning	8	2756	Mean Difference (IV, Random, 95% CI)	1.98 [0.26, 3.70]
1.9.7 Emotional performance	7	2638	Mean Difference (IV, Random, 95% CI)	0.69 [-1.33, 2.71]
1.9.8 Mental health	8	2756	Mean Difference (IV, Random, 95% CI)	5.60 [1.21, 9.98]
1.10 HRQoL EQ-5D at 6 to 12 months follow up	3	476	Mean Difference (IV, Random, 95% CI)	0.05 [-0.01, 0.10]

Analysis 1.1. Comparison 1: Exercise-based rehabilitation versus control, Outcome 1: All-cause mortality

Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.1.1 Follow-up of 6 to 12 months						
Bell 1998	19	251	8	102	5.0%	0.97 [0.44 , 2.13]
Bertie 1992	0	57	3	53	0.4%	0.13 [0.01 , 2.52]
Bethell 1990	16	113	12	116	6.4%	1.37 [0.68 , 2.76]
Briffa 2005	0	57	2	56	0.3%	0.20 [0.01 , 4.00]
Campo 2020	1	118	3	117	0.6%	0.33 [0.03 , 3.13]
Carlsson 1998	2	113	2	112	0.8%	0.99 [0.14 , 6.91]
DeBusk 1994	12	293	10	292	4.6%	1.20 [0.52 , 2.72]
Engblom 1996	12	119	13	109	5.7%	0.85 [0.40 , 1.77]
Fletcher 1994	3	41	4	47	1.5%	0.86 [0.20 , 3.62]
Fridlund 1991	9	87	14	91	5.1%	0.67 [0.31 , 1.47]
Hautala 2017	0	109	1	95	0.3%	0.29 [0.01 , 7.06]
Heller 1993	6	213	3	237	1.7%	2.23 [0.56 , 8.79]
Higgins 2001	1	54	0	49	0.3%	2.73 [0.11 , 65.43]
Holmbäck 1994	1	34	1	35	0.4%	1.03 [0.07 , 15.80]
Mutwalli 2012	0	28	1	21	0.3%	0.25 [0.01 , 5.91]
Oldridge 1991	3	99	4	102	1.4%	0.77 [0.18 , 3.36]
Reid 2012	0	115	2	108	0.3%	0.19 [0.01 , 3.87]
Schuler 1992	2	56	1	57	0.6%	2.04 [0.19 , 21.82]
Sivarajan 1982 (1)	3	74	1	36	0.6%	1.46 [0.16 , 13.54]
Sivarajan 1982 (2)	3	79	1	36	0.6%	1.37 [0.15 , 12.70]
Snoek 2020	1	89	0	90	0.3%	3.03 [0.13 , 73.48]
Stern 1983	0	42	1	29	0.3%	0.23 [0.01 , 5.52]
Wang 2012	1	80	3	80	0.6%	0.33 [0.04 , 3.14]
West 2012	54	903	47	910	21.7%	1.16 [0.79 , 1.69]
WHO 1983	60	1208	76	1096	29.0%	0.72 [0.52 , 0.99]
Wilhelmsen 1975	19	158	29	157	11.0%	0.65 [0.38 , 1.11]
Subtotal (95% CI)		**4590**		**4233**	**100.0%**	**0.87 [0.73 , 1.04]**
Total events:	228		242			
Heterogeneity: Tau² = 0.00; Chi² = 17.73, df = 25 (P = 0.85); I² = 0%						
Test for overall effect: Z = 1.53 (P = 0.13)						
1.1.2 Follow-up of > 12 to 36 months						
Bengtsson 1983	10	81	6	90	1.5%	1.85 [0.70 , 4.87]
Carson 1982	12	151	21	152	3.1%	0.58 [0.29 , 1.13]
Hambrecht 2004	1	51	2	50	0.3%	0.49 [0.05 , 5.24]
Kallio 1979	41	188	56	187	11.6%	0.73 [0.51 , 1.03]
Lear 2015	0	34	1	37	0.1%	0.36 [0.02 , 8.59]
Leizorovicz 1991	0	60	4	61	0.2%	0.11 [0.01 , 2.05]
Pal 2013	2	129	3	129	0.4%	0.67 [0.11 , 3.92]
Prabhakaran 2020	77	1953	77	1968	14.7%	1.01 [0.74 , 1.37]
Shaw 1981	15	323	24	328	3.6%	0.63 [0.34 , 1.19]
Ståhle 1999	5	56	3	53	0.7%	1.58 [0.40 , 6.28]
Toobert 2000	1	17	0	11	0.1%	2.00 [0.09 , 45.12]
VHSG 2003	2	98	1	99	0.2%	2.02 [0.19 , 21.92]
West 2012	104	903	107	910	21.9%	0.98 [0.76 , 1.26]
WHO 1983	169	1208	169	1096	36.3%	0.91 [0.75 , 1.10]
Yu 2004	4	132	4	72	0.8%	0.55 [0.14 , 2.12]
Zwisler 2008	24	227	20	219	4.4%	1.16 [0.66 , 2.03]
Subtotal (95% CI)		**5611**		**5462**	**100.0%**	**0.90 [0.80 , 1.02]**
Total events:	467		498			
Heterogeneity: Tau² = 0.00; Chi² = 12.66, df = 15 (P = 0.63); I² = 0%						
Test for overall effect: Z = 1.66 (P = 0.10)						



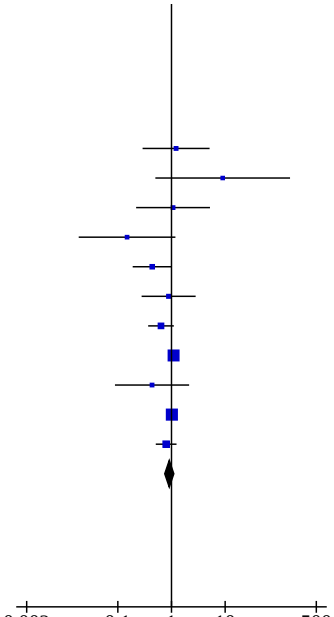
Analysis 1.1. (Continued)

Heterogeneity: Tau² = 0.00; Chi² = 12.66, df = 15 (P = 0.63); I² = 0%
Test for overall effect: Z = 1.66 (P = 0.10)

1.1.3 Follow-up longer than 3 years

Andersen 1981	4	46	3	42	1.7%	1.22 [0.29 , 5.12]
Erdman 1986	4	40	0	40	0.4%	9.00 [0.50 , 161.86]
Haskell 1994	3	145	3	155	1.4%	1.07 [0.22 , 5.21]
Hofman-Bang 1999	1	46	6	41	0.9%	0.15 [0.02 , 1.18]
Maroto 2005	7	90	16	90	4.7%	0.44 [0.19 , 1.01]
Oerkild 2012	4	19	5	21	2.6%	0.88 [0.28 , 2.82]
Roman 1983	16	93	27	100	9.5%	0.64 [0.37 , 1.10]
Shaw 1981	162	315	150	319	31.9%	1.09 [0.93 , 1.28]
Vermeulen 1983	2	47	5	51	1.4%	0.43 [0.09 , 2.13]
West 2012	245	903	243	910	32.4%	1.02 [0.87 , 1.18]
Wilhelmsen 1975	28	158	35	157	12.9%	0.79 [0.51 , 1.24]
Subtotal (95% CI)		**1902**		**1926**	**100.0%**	**0.91 [0.75 , 1.10]**
Total events:	476		493			

Heterogeneity: Tau² = 0.02; Chi² = 15.45, df = 10 (P = 0.12); I² = 35%
Test for overall effect: Z = 0.96 (P = 0.34)



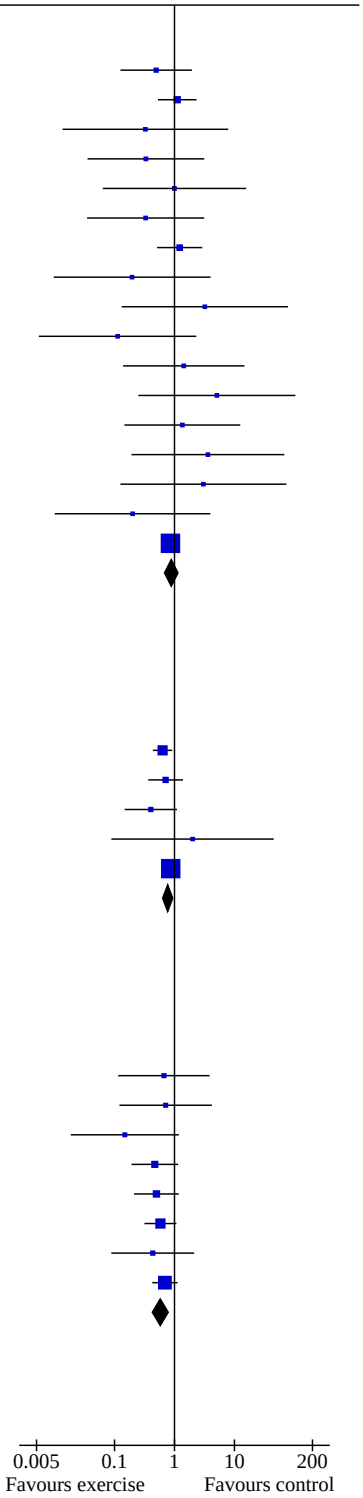
Footnotes

(1) Two entries for Sivarajan 1982, the second entry refers to group B2 who received exercise plus education and counselling

(2) Two entries for Sivarajan 1982, the first entry refers to patients in group B1 who received exercise only

Analysis 1.2. Comparison 1: Exercise-based rehabilitation versus control, Outcome 2: Cardiovascular mortality

Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.2.1 Follow-up of 6 to 12 months						
Aronov 2010	3	197	6	195	3.5%	0.49 [0.13 , 1.95]
Bethell 1990	13	113	12	116	12.2%	1.11 [0.53 , 2.33]
Briffa 2005	0	57	1	56	0.7%	0.33 [0.01 , 7.87]
Bubnova 2020 (1)	1	78	3	78	1.3%	0.33 [0.04 , 3.14]
Bubnova 2020 (2)	1	78	1	78	0.9%	1.00 [0.06 , 15.71]
Campo 2020	1	118	3	117	1.3%	0.33 [0.03 , 3.13]
DeBusk 1994	11	293	9	292	8.9%	1.22 [0.51 , 2.90]
Hambrecht 2004	0	51	2	50	0.7%	0.20 [0.01 , 3.99]
Haskell 1994	1	145	0	155	0.7%	3.21 [0.13 , 78.06]
Miller 1984	0	127	2	71	0.7%	0.11 [0.01 , 2.31]
Ornish 1990	2	28	1	20	1.2%	1.43 [0.14 , 14.70]
Schuler 1992	2	56	0	57	0.7%	5.09 [0.25 , 103.66]
Sivarajan 1982 (3)	3	71	1	32	1.3%	1.35 [0.15 , 12.50]
Sivarajan 1982 (4)	3	65	0	33	0.8%	3.61 [0.19 , 67.81]
Snoek 2020	1	89	0	90	0.7%	3.03 [0.13 , 73.48]
Vecchio 1981	0	25	2	25	0.7%	0.20 [0.01 , 3.97]
WHO 1983	67	1208	71	1096	63.6%	0.86 [0.62 , 1.18]
Subtotal (95% CI)		**2799**		**2561**	**100.0%**	**0.88 [0.68 , 1.14]**
Total events:	109		114			
Heterogeneity: Tau² = 0.00; Chi² = 10.85, df = 16 (P = 0.82); I² = 0%						
Test for overall effect: Z = 0.95 (P = 0.34)						
1.2.2 Follow-up of > 12 months to 36 months						
Kallio 1979	35	188	55	187	24.5%	0.63 [0.44 , 0.92]
Shaw 1981	14	323	20	328	8.2%	0.71 [0.37 , 1.38]
Specchia 1996	5	125	13	131	3.7%	0.40 [0.15 , 1.10]
Toobert 2000	1	17	0	11	0.4%	2.00 [0.09 , 45.12]
WHO 1983	144	1208	151	1096	63.3%	0.87 [0.70 , 1.07]
Subtotal (95% CI)		**1861**		**1753**	**100.0%**	**0.77 [0.63 , 0.93]**
Total events:	199		239			
Heterogeneity: Tau² = 0.00; Chi² = 4.21, df = 4 (P = 0.38); I² = 5%						
Test for overall effect: Z = 2.66 (P = 0.008)						
1.2.3 Follow-up of longer than 3 years						
Dugmore 1999	2	62	3	62	3.0%	0.67 [0.12 , 3.85]
Haskell 1994	2	145	3	155	2.9%	0.71 [0.12 , 4.20]
Hofman-Bang 1999	1	46	6	41	2.2%	0.15 [0.02 , 1.18]
La Rovere 2002	6	49	12	46	11.6%	0.47 [0.19 , 1.15]
Maroto 2005	7	90	14	90	12.5%	0.50 [0.21 , 1.18]
Roman 1983	13	93	24	100	24.6%	0.58 [0.32 , 1.08]
Vermeulen 1983	2	47	5	51	3.7%	0.43 [0.09 , 2.13]
Wilhelmsen 1975	23	158	33	157	39.5%	0.69 [0.43 , 1.12]
Subtotal (95% CI)		**690**		**702**	**100.0%**	**0.58 [0.43 , 0.78]**
Total events:	56		100			
Heterogeneity: Tau² = 0.00; Chi² = 2.73, df = 7 (P = 0.91); I² = 0%						
Test for overall effect: Z = 3.52 (P = 0.0004)						
Test for subgroup differences: Chi² = 4.37, df = 2 (P = 0.11), I² = 54.3%						



Footnotes

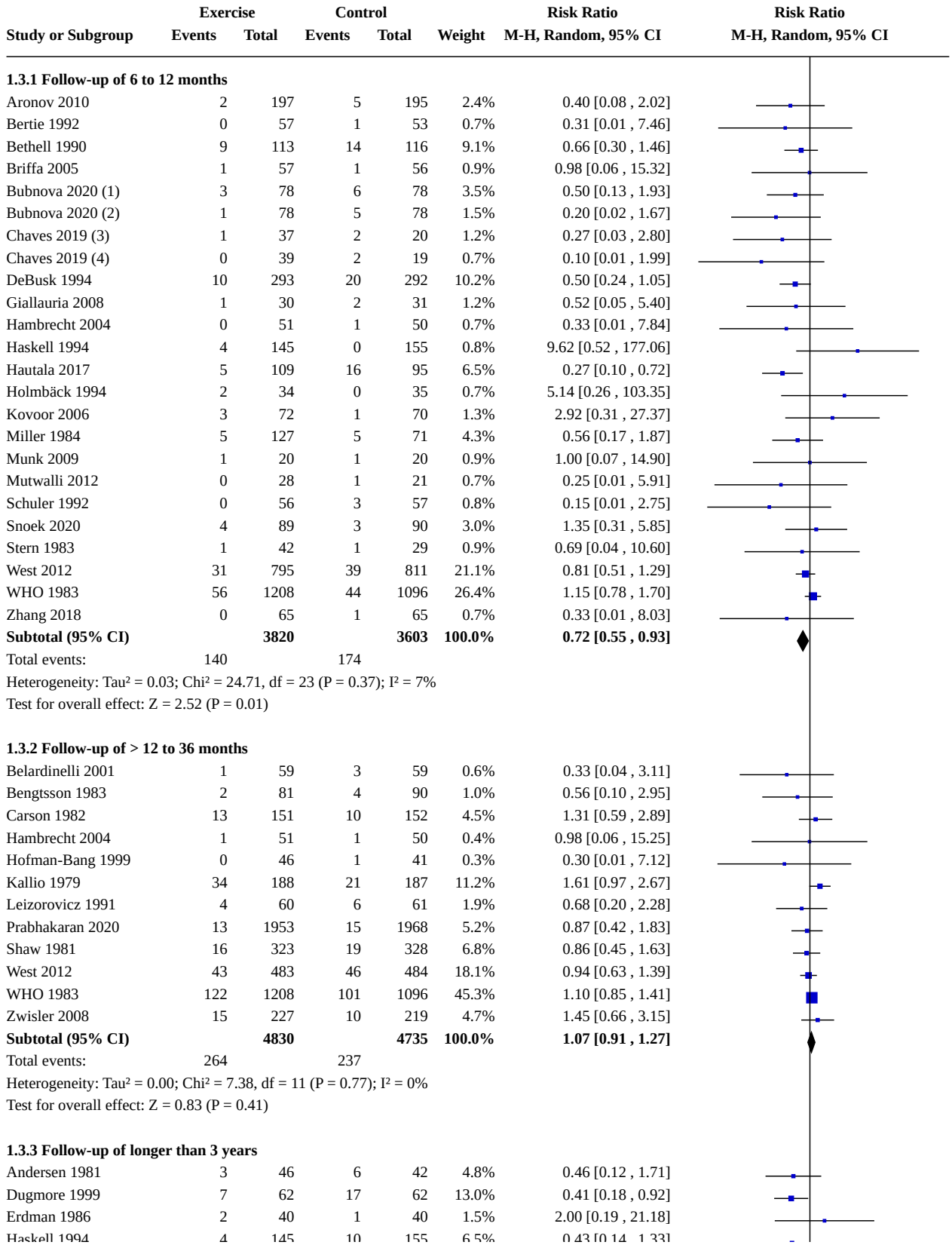
(1) Two entries for Bubnova 2020, the second entry refers to patients with BMI ≥30 kg/m2

(2) Two entries for Bubnova 2020, the first entry refers to patients with BMI <30 kg/m2

Analysis 1.2. (Continued)

(1) Two entries for Bubnova 2020, the second entry refers to patients with BMI ≥30 kg/m2
(2) Two entries for Bubnova 2020, the first entry refers to patients with BMI <30 kg/m2
(3) Two entries for Sivarajan 1982, the first entry refers to patients in group B1 who received exercise only
(4) Two entries for Sivarajan 1982, the second entry refers to group B2 who received exercise plus education and counselling

Analysis 1.3. Comparison 1: Exercise-based rehabilitation versus control, Outcome 3: Fatal and/or nonfatal MI



Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.3.1 Follow-up of 6 to 12 months						
Aronov 2010	2	197	5	195	2.4%	0.40 [0.08 , 2.02]
Bertie 1992	0	57	1	53	0.7%	0.31 [0.01 , 7.46]
Bethell 1990	9	113	14	116	9.1%	0.66 [0.30 , 1.46]
Briffa 2005	1	57	1	56	0.9%	0.98 [0.06 , 15.32]
Bubnova 2020 (1)	3	78	6	78	3.5%	0.50 [0.13 , 1.93]
Bubnova 2020 (2)	1	78	5	78	1.5%	0.20 [0.02 , 1.67]
Chaves 2019 (3)	1	37	2	20	1.2%	0.27 [0.03 , 2.80]
Chaves 2019 (4)	0	39	2	19	0.7%	0.10 [0.01 , 1.99]
DeBusk 1994	10	293	20	292	10.2%	0.50 [0.24 , 1.05]
Giallauria 2008	1	30	2	31	1.2%	0.52 [0.05 , 5.40]
Hambrecht 2004	0	51	1	50	0.7%	0.33 [0.01 , 7.84]
Haskell 1994	4	145	0	155	0.8%	9.62 [0.52 , 177.06]
Hautala 2017	5	109	16	95	6.5%	0.27 [0.10 , 0.72]
Holmbäck 1994	2	34	0	35	0.7%	5.14 [0.26 , 103.35]
Kovoor 2006	3	72	1	70	1.3%	2.92 [0.31 , 27.37]
Miller 1984	5	127	5	71	4.3%	0.56 [0.17 , 1.87]
Munk 2009	1	20	1	20	0.9%	1.00 [0.07 , 14.90]
Mutwalli 2012	0	28	1	21	0.7%	0.25 [0.01 , 5.91]
Schuler 1992	0	56	3	57	0.8%	0.15 [0.01 , 2.75]
Snoek 2020	4	89	3	90	3.0%	1.35 [0.31 , 5.85]
Stern 1983	1	42	1	29	0.9%	0.69 [0.04 , 10.60]
West 2012	31	795	39	811	21.1%	0.81 [0.51 , 1.29]
WHO 1983	56	1208	44	1096	26.4%	1.15 [0.78 , 1.70]
Zhang 2018	0	65	1	65	0.7%	0.33 [0.01 , 8.03]
Subtotal (95% CI)		**3820**		**3603**	**100.0%**	**0.72 [0.55 , 0.93]**
Total events:	140		174			
Heterogeneity: Tau² = 0.03; Chi² = 24.71, df = 23 (P = 0.37); I² = 7%						
Test for overall effect: Z = 2.52 (P = 0.01)						
1.3.2 Follow-up of > 12 to 36 months						
Belardinelli 2001	1	59	3	59	0.6%	0.33 [0.04 , 3.11]
Bengtsson 1983	2	81	4	90	1.0%	0.56 [0.10 , 2.95]
Carson 1982	13	151	10	152	4.5%	1.31 [0.59 , 2.89]
Hambrecht 2004	1	51	1	50	0.4%	0.98 [0.06 , 15.25]
Hofman-Bang 1999	0	46	1	41	0.3%	0.30 [0.01 , 7.12]
Kallio 1979	34	188	21	187	11.2%	1.61 [0.97 , 2.67]
Leizorovicz 1991	4	60	6	61	1.9%	0.68 [0.20 , 2.28]
Prabhakaran 2020	13	1953	15	1968	5.2%	0.87 [0.42 , 1.83]
Shaw 1981	16	323	19	328	6.8%	0.86 [0.45 , 1.63]
West 2012	43	483	46	484	18.1%	0.94 [0.63 , 1.39]
WHO 1983	122	1208	101	1096	45.3%	1.10 [0.85 , 1.41]
Zwisler 2008	15	227	10	219	4.7%	1.45 [0.66 , 3.15]
Subtotal (95% CI)		**4830**		**4735**	**100.0%**	**1.07 [0.91 , 1.27]**
Total events:	264		237			
Heterogeneity: Tau² = 0.00; Chi² = 7.38, df = 11 (P = 0.77); I² = 0%						
Test for overall effect: Z = 0.83 (P = 0.41)						
1.3.3 Follow-up of longer than 3 years						
Andersen 1981	3	46	6	42	4.8%	0.46 [0.12 , 1.71]
Dugmore 1999	7	62	17	62	13.0%	0.41 [0.18 , 0.92]
Erdman 1986	2	40	1	40	1.5%	2.00 [0.19 , 21.18]
Haskell 1994	4	145	10	155	6.5%	0.43 [0.14 , 1.33]

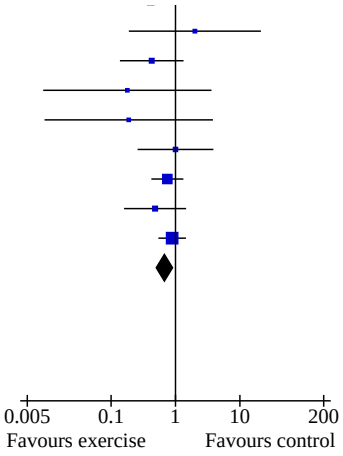
Analysis 1.3. (Continued)

Erdman 1986	2	40	1	40	1.5%	2.00 [0.19 , 21.18]
Haskell 1994	4	145	10	155	6.5%	0.43 [0.14 , 1.33]
Hofman-Bang 1999	0	46	2	41	0.9%	0.18 [0.01 , 3.62]
La Rovere 2002	0	49	2	46	0.9%	0.19 [0.01 , 3.81]
Maroto 2005	4	90	4	90	4.6%	1.00 [0.26 , 3.88]
Roman 1983	16	93	23	100	25.8%	0.75 [0.42 , 1.33]
Vermeulen 1983	4	47	9	51	6.9%	0.48 [0.16 , 1.46]
Wilhelmsen 1975	25	158	28	157	34.9%	0.89 [0.54 , 1.45]
Subtotal (95% CI)		**776**		**784**	**100.0%**	**0.67 [0.50 , 0.90]**
Total events:	65		102			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 6.68$, df = 9 (P = 0.67); $I^2 = 0\%$

Test for overall effect: Z = 2.68 (P = 0.007)

Test for subgroup differences: $Chi^2 = 11.01$, df = 2 (P = 0.004), $I^2 = 81.8\%$



Footnotes

(1) Two entries for Bubnova 2020, the second entry refers to patients with BMI ≥30 kg/m2

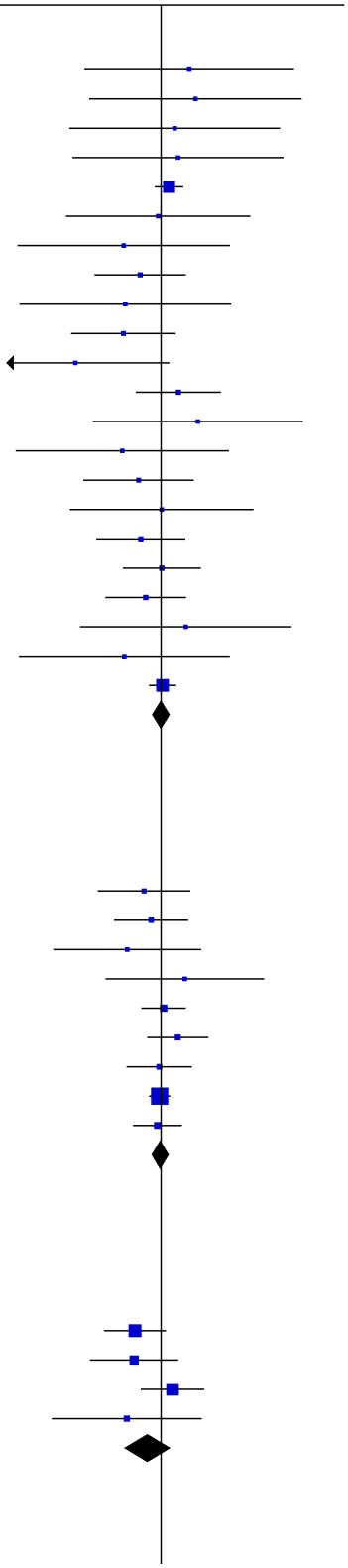
(2) Two entries for Bubnova 2020, the first entry refers to patients with BMI <30 kg/m2

(3) Two entries for Chaves 2019, the second entry refers to patients in the comprehensive CR intervention group

(4) Two entries for Chaves 2019, the first entry refers to patients in the exercise only intervention group

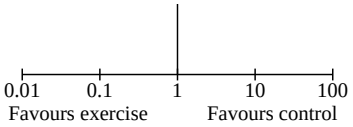
Analysis 1.4. Comparison 1: Exercise-based rehabilitation versus control, Outcome 4: CABG

Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.4.1 Follow-up of 6 to 12 months						
Bäck 2008	1	21	0	16	0.6%	2.32 [0.10 , 53.42]
Bertie 1992	1	57	0	53	0.6%	2.79 [0.12 , 67.10]
Chaves 2019 (1)	1	39	0	19	0.6%	1.50 [0.06 , 35.19]
Chaves 2019 (2)	1	37	0	20	0.6%	1.66 [0.07 , 38.92]
DeBusk 1994	42	293	33	292	32.8%	1.27 [0.83 , 1.94]
Engblom 1996	1	119	1	109	0.8%	0.92 [0.06 , 14.47]
Hambrecht 2004	0	51	1	50	0.6%	0.33 [0.01 , 7.84]
Haskell 1994	3	145	6	155	3.2%	0.53 [0.14 , 2.10]
Holmbäck 1994	0	34	1	35	0.6%	0.34 [0.01 , 8.13]
Kovoor 2006	2	72	6	70	2.4%	0.32 [0.07 , 1.55]
Manchanda 2000	0	21	6	21	0.8%	0.08 [0.00 , 1.28]
Miller 1984	9	127	3	71	3.7%	1.68 [0.47 , 6.00]
Munk 2009	1	20	0	20	0.6%	3.00 [0.13 , 69.52]
Reid 2012	0	115	1	108	0.6%	0.31 [0.01 , 7.61]
Sandström 2005	2	50	4	51	2.2%	0.51 [0.10 , 2.66]
Schuler 1992	1	56	1	57	0.8%	1.02 [0.07 , 15.88]
Sivarajan 1982 (3)	4	77	4	42	3.3%	0.55 [0.14 , 2.07]
Sivarajan 1982 (4)	7	72	4	42	4.4%	1.02 [0.32 , 3.28]
Ståhle 1999	4	56	6	53	4.1%	0.63 [0.19 , 2.11]
Stern 1983	1	42	0	29	0.6%	2.09 [0.09 , 49.65]
Vecchio 1981	0	25	1	25	0.6%	0.33 [0.01 , 7.81]
West 2012	44	795	43	811	35.7%	1.04 [0.69 , 1.57]
Subtotal (95% CI)		**2324**		**2149**	**100.0%**	**0.99 [0.78 , 1.27]**
Total events:	125		121			
Heterogeneity: Tau² = 0.00; Chi² = 13.36, df = 21 (P = 0.90); I² = 0%						
Test for overall effect: Z = 0.05 (P = 0.96)						
1.4.2 Follow-up of > 12 to 36 months						
Belardinelli 2001	3	59	5	59	2.9%	0.60 [0.15 , 2.40]
Hofman-Bang 1999	5	46	6	41	4.5%	0.74 [0.24 , 2.25]
Lear 2015	1	34	3	37	1.1%	0.36 [0.04 , 3.32]
Leizorovicz 1991	2	60	1	61	1.0%	2.03 [0.19 , 21.84]
Shaw 1981	17	323	16	328	12.6%	1.08 [0.55 , 2.10]
Specchia 1996	11	125	7	131	6.7%	1.65 [0.66 , 4.11]
Ståhle 1999	7	56	7	53	5.8%	0.95 [0.36 , 2.52]
West 2012	64	483	67	484	54.9%	0.96 [0.70 , 1.32]
Zwisler 2008	13	227	14	219	10.4%	0.90 [0.43 , 1.86]
Subtotal (95% CI)		**1413**		**1413**	**100.0%**	**0.97 [0.77 , 1.23]**
Total events:	123		126			
Heterogeneity: Tau² = 0.00; Chi² = 3.25, df = 8 (P = 0.92); I² = 0%						
Test for overall effect: Z = 0.24 (P = 0.81)						
1.4.3 Follow-up of longer than 3 years						
Haskell 1994	6	145	14	155	36.2%	0.46 [0.18 , 1.16]
Hofman-Bang 1999	3	46	6	41	20.8%	0.45 [0.12 , 1.67]
La Rovere 2002	9	49	6	46	35.0%	1.41 [0.54 , 3.65]
Roman 1983	1	93	3	100	8.0%	0.36 [0.04 , 3.39]
Subtotal (95% CI)		**333**		**342**	**100.0%**	**0.66 [0.34 , 1.27]**
Total events:	19		29			
Heterogeneity: Tau² = 0.08; Chi² = 3.67, df = 3 (P = 0.30); I² = 18%						
Test for overall effect: Z = 1.24 (P = 0.22)						



Analysis 1.4. (Continued)

Test for overall effect: Z = 1.24 (P = 0.22)



Footnotes

(1) Two entries for Chaves 2019, the first entry refers to patients in the exercise only intervention group

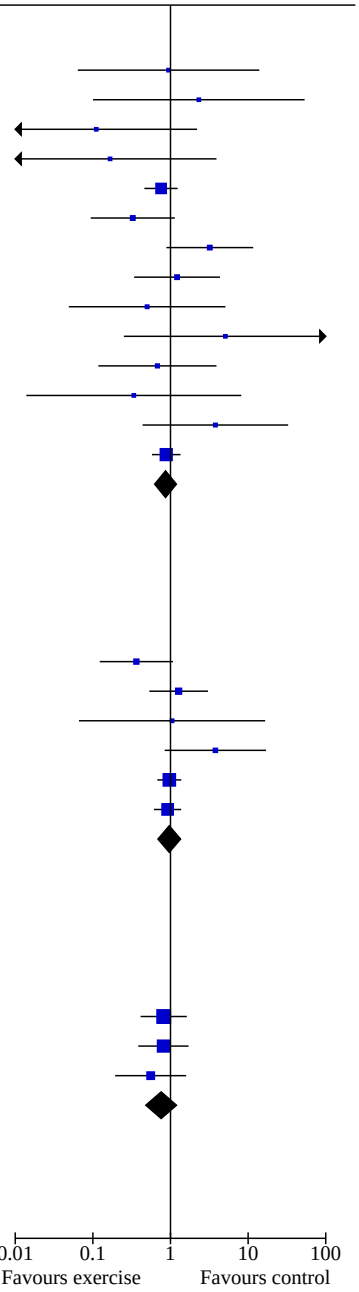
(2) Two entries for Chaves 2019, the second entry refers to patients in the comprehensive CR intervention group

(3) Two entries for Sivarajan 1982, the second entry refers to group B2 who received exercise plus education and counselling

(4) Two entries for Sivarajan 1982, the first entry refers to patients in group B1 who received exercise only

Analysis 1.5. Comparison 1: Exercise-based rehabilitation versus control, Outcome 5: PCI

Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.5.1 Follow-up of 6 to 12 months						
Aronov 2019	1	18	1	17	1.4%	0.94 [0.06 , 13.93]
Bäck 2008	1	21	0	16	1.0%	2.32 [0.10 , 53.42]
Chaves 2019 (1)	0	37	2	20	1.1%	0.11 [0.01 , 2.20]
Chaves 2019 (2)	0	39	1	19	1.0%	0.17 [0.01 , 3.91]
DeBusk 1994	25	293	33	292	30.3%	0.75 [0.46 , 1.24]
Hambrecht 2004	3	51	9	50	6.3%	0.33 [0.09 , 1.14]
Haskell 1994	9	145	3	155	5.9%	3.21 [0.89 , 11.61]
Kovoor 2006	5	72	4	70	6.0%	1.22 [0.34 , 4.34]
Manchanda 2000	1	21	2	21	1.9%	0.50 [0.05 , 5.10]
Sandström 2005	2	50	0	51	1.1%	5.10 [0.25 , 103.60]
Schuler 1992	2	56	3	57	3.3%	0.68 [0.12 , 3.91]
Snoek 2020	0	89	1	90	1.0%	0.34 [0.01 , 8.16]
Ståhle 1999	4	56	1	53	2.2%	3.79 [0.44 , 32.79]
West 2012	38	795	44	811	37.4%	0.88 [0.58 , 1.34]
Subtotal (95% CI)		**1743**		**1722**	**100.0%**	**0.86 [0.63 , 1.19]**
Total events:	91		104			
Heterogeneity: Tau² = 0.03; Chi² = 13.90, df = 13 (P = 0.38); I² = 7%						
Test for overall effect: Z = 0.89 (P = 0.37)						
1.5.2 Follow-up of > 12 to 36 months						
Belardinelli 2001	4	59	11	59	8.4%	0.36 [0.12 , 1.08]
Hofman-Bang 1999	10	46	7	41	12.2%	1.27 [0.53 , 3.04]
Specchia 1996	1	125	1	131	1.4%	1.05 [0.07 , 16.57]
Ståhle 1999	8	56	2	53	4.6%	3.79 [0.84 , 17.02]
West 2012	53	483	55	484	38.8%	0.97 [0.68 , 1.38]
Zwisler 2008	38	227	40	219	34.5%	0.92 [0.61 , 1.37]
Subtotal (95% CI)		**996**		**987**	**100.0%**	**0.96 [0.69 , 1.35]**
Total events:	114		116			
Heterogeneity: Tau² = 0.04; Chi² = 6.73, df = 5 (P = 0.24); I² = 26%						
Test for overall effect: Z = 0.21 (P = 0.83)						
1.5.3 Follow-up of longer than 3 years						
Haskell 1994	13	145	17	155	44.1%	0.82 [0.41 , 1.62]
Hofman-Bang 1999	10	46	11	41	37.3%	0.81 [0.38 , 1.71]
Maroto 2005	5	90	9	90	18.7%	0.56 [0.19 , 1.59]
Subtotal (95% CI)		**281**		**286**	**100.0%**	**0.76 [0.48 , 1.20]**
Total events:	28		37			
Heterogeneity: Tau² = 0.00; Chi² = 0.41, df = 2 (P = 0.81); I² = 0%						
Test for overall effect: Z = 1.19 (P = 0.23)						



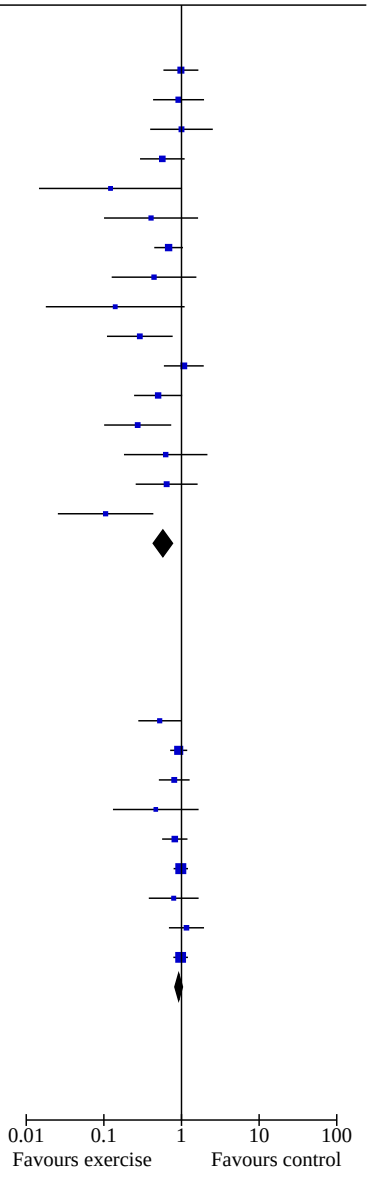
Footnotes

(1) Two entries for Chaves 2019, the first entry refers to patients in the exercise only intervention group

(2) Two entries for Chaves 2019, the second entry refers to patients in the comprehensive CR intervention group

Analysis 1.6. Comparison 1: Exercise-based rehabilitation versus control, Outcome 6: All-cause hospital admissions

Study or Subgroup	Exercise Events	Exercise Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.6.1 Follow-up of 6 to 12 months						
Briffa 2005	19	57	19	56	11.0%	0.98 [0.59 , 1.65]
Bubnova 2020 (1)	11	78	12	78	7.8%	0.92 [0.43 , 1.95]
Bubnova 2020 (2)	8	78	8	78	6.1%	1.00 [0.40 , 2.53]
Campo 2020	12	118	21	117	8.9%	0.57 [0.29 , 1.10]
Chaves 2019 (3)	1	39	4	19	1.6%	0.12 [0.01 , 1.02]
Chaves 2019 (4)	3	37	4	20	3.4%	0.41 [0.10 , 1.64]
Engblom 1996	26	102	34	91	12.4%	0.68 [0.45 , 1.04]
Giallauria 2008	3	30	7	31	4.0%	0.44 [0.13 , 1.55]
Hambrecht 2004	1	51	7	50	1.7%	0.14 [0.02 , 1.10]
Hautala 2017	5	109	15	95	5.7%	0.29 [0.11 , 0.77]
Hofman-Bang 1999	16	48	14	45	9.9%	1.07 [0.59 , 1.93]
Lewin 1992	9	58	18	58	8.3%	0.50 [0.25 , 1.02]
Mutwalli 2012	4	28	11	21	5.6%	0.27 [0.10 , 0.74]
Reid 2012	4	115	6	108	4.1%	0.63 [0.18 , 2.16]
Santaularia 2017	6	41	10	44	6.2%	0.64 [0.26 , 1.61]
Zhang 2018	2	65	19	65	3.3%	0.11 [0.03 , 0.43]
Subtotal (95% CI)		**1054**		**976**	**100.0%**	**0.58 [0.43 , 0.77]**
Total events:	130		209			
Heterogeneity: Tau² = 0.12; Chi² = 25.70, df = 15 (P = 0.04); I² = 42%						
Test for overall effect: Z = 3.79 (P = 0.0001)						
1.6.2 Follow-up of > 12 to 36 months						
Belardinelli 2001	11	59	21	59	3.1%	0.52 [0.28 , 0.99]
Haskell 1994	62	145	72	155	19.7%	0.92 [0.71 , 1.19]
Hofman-Bang 1999	19	46	21	41	6.1%	0.81 [0.51 , 1.27]
Lear 2015	3	34	7	37	0.8%	0.47 [0.13 , 1.66]
Prabhakaran 2020	48	1953	59	1968	8.9%	0.82 [0.56 , 1.19]
Shaw 1981	109	323	113	328	27.6%	0.98 [0.79 , 1.21]
VHSG 2003	11	98	14	99	2.3%	0.79 [0.38 , 1.66]
Yu 2004	34	132	16	72	4.7%	1.16 [0.69 , 1.95]
Zwisler 2008	95	227	94	219	26.9%	0.98 [0.79 , 1.21]
Subtotal (95% CI)		**3017**		**2978**	**100.0%**	**0.92 [0.82 , 1.03]**
Total events:	392		417			
Heterogeneity: Tau² = 0.00; Chi² = 6.37, df = 8 (P = 0.61); I² = 0%						
Test for overall effect: Z = 1.47 (P = 0.14)						



Footnotes

(1) Two entries for Bubnova 2020, the second entry refers to patients with BMI ≥30 kg/m2

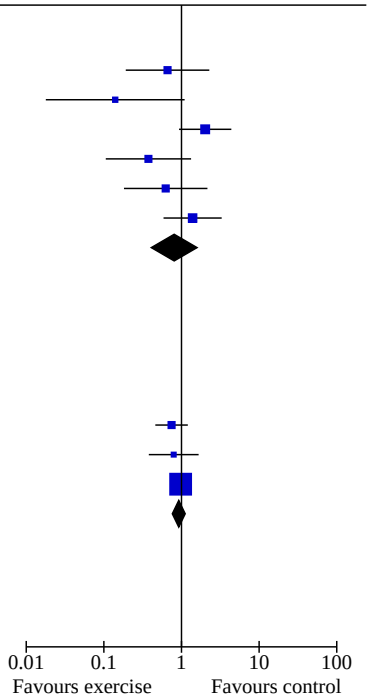
(2) Two entries for Bubnova 2020, the first entry refers to patients with BMI <30 kg/m2

(3) Two entries for Chaves 2019, the second entry refers to patients in the comprehensive CR intervention group

(4) Two entries for Chaves 2019, the first entry refers to patients in the exercise only intervention group

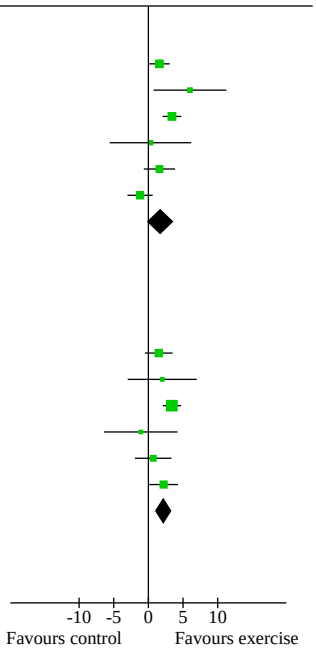
Analysis 1.7. Comparison 1: Exercise-based rehabilitation versus control, Outcome 7: Cardiovascular hospital admissions

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.7.1 Follow-up of 6 to 12 months						
Campo 2020	4	118	6	117	15.8%	0.66 [0.19 , 2.28]
Hambrecht 2004	1	51	7	50	8.2%	0.14 [0.02 , 1.10]
Haskell 1994	17	145	9	155	23.2%	2.02 [0.93 , 4.39]
Mutwalli 2012	3	28	6	21	15.4%	0.38 [0.11 , 1.33]
Reid 2012	4	115	6	108	15.8%	0.63 [0.18 , 2.16]
Snoek 2020	11	89	8	90	21.6%	1.39 [0.59 , 3.29]
Subtotal (95% CI)		**546**		**541**	**100.0%**	**0.80 [0.41 , 1.59]**
Total events:	40		42			
Heterogeneity: Tau² = 0.36; Chi² = 10.57, df = 5 (P = 0.06); I² = 53%						
Test for overall effect: Z = 0.63 (P = 0.53)						
1.7.2 Follow up of >12 to 36 months						
Haskell 1994	23	145	33	155	15.7%	0.75 [0.46 , 1.21]
VHSG 2003	11	98	14	99	6.7%	0.79 [0.38 , 1.66]
Zwisler 2008	95	227	94	219	77.7%	0.98 [0.79 , 1.21]
Subtotal (95% CI)		**470**		**473**	**100.0%**	**0.92 [0.76 , 1.12]**
Total events:	129		141			
Heterogeneity: Tau² = 0.00; Chi² = 1.20, df = 2 (P = 0.55); I² = 0%						
Test for overall effect: Z = 0.83 (P = 0.40)						



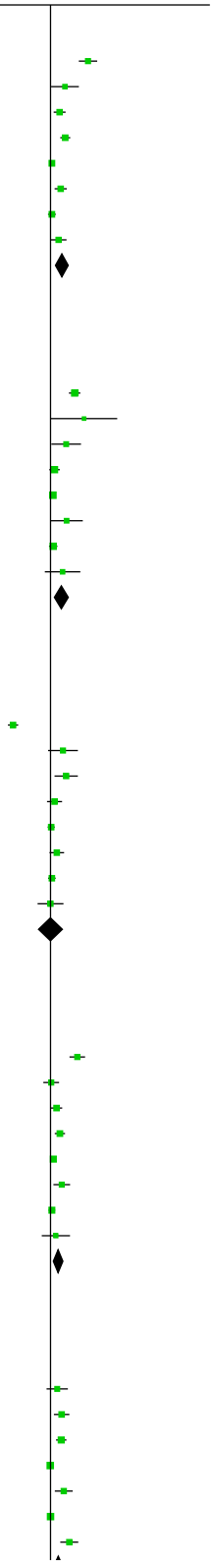
Analysis 1.8. Comparison 1: Exercise-based rehabilitation versus control, Outcome 8: HRQoL SF-36 summary scores at 6 to 12 months follow up

Study or Subgroup	Exercise Mean	Exercise SD	Exercise Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
1.8.1 Physical component score								
Dorje 2019	46.8	6.9	156	45.2	6.5	156	22.5%	1.60 [0.11 , 3.09]
He 2020	79	29	232	73	29	236	8.0%	6.00 [0.75 , 11.25]
Ma 2020	13.3	6	150	9.9	5.9	150	23.2%	3.40 [2.05 , 4.75]
Oerkild 2012	-1.1	8.2	17	-1.4	9.8	19	6.8%	0.30 [-5.58 , 6.18]
Snoek 2020	50.6	7.2	89	49	8.2	90	18.7%	1.60 [-0.66 , 3.86]
Zwisler 2008	45.2	9.8	227	46.4	9.8	219	20.9%	-1.20 [-3.02 , 0.62]
Subtotal (95% CI)			**871**			**870**	**100.0%**	**1.70 [-0.08 , 3.47]**
Heterogeneity: Tau² = 3.07; Chi² = 18.67, df = 5 (P = 0.002); I² = 73%								
Test for overall effect: Z = 1.87 (P = 0.06)								
1.8.2 Mental component score								
Dorje 2019	51.5	9.3	156	50	8.6	156	21.4%	1.50 [-0.49 , 3.49]
He 2020	73	28	232	71	27	236	4.4%	2.00 [-2.98 , 6.98]
Ma 2020	12.4	5.4	150	9	6.2	150	36.4%	3.40 [2.08 , 4.72]
Oerkild 2012	-1.4	7.3	17	-0.3	8.9	19	3.9%	-1.10 [-6.40 , 4.20]
Snoek 2020	53.2	8.8	89	52.5	9.2	90	13.8%	0.70 [-1.94 , 3.34]
Zwisler 2008	50.6	10.8	227	48.4	11.5	219	20.1%	2.20 [0.13 , 4.27]
Subtotal (95% CI)			**871**			**870**	**100.0%**	**2.14 [1.07 , 3.22]**
Heterogeneity: Tau² = 0.38; Chi² = 6.32, df = 5 (P = 0.28); I² = 21%								
Test for overall effect: Z = 3.91 (P < 0.0001)								



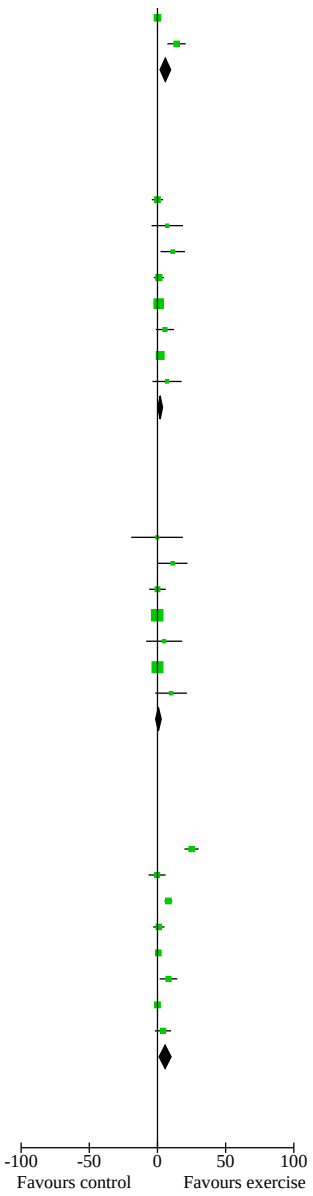
Analysis 1.9. Comparison 1: Exercise-based rehabilitation versus control, Outcome 9: HRQoL SF-36 8 domains at 6 to 12 months follow up

Study or Subgroup	Exercise Mean	Exercise SD	Exercise Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
1.9.1 Physical functioning								
Belardinelli 2001	82	18	59	54	20	59	11.3%	28.00 [21.13 , 34.87]
Briffa 2005	17.6	27.7	55	6.8	26.7	51	8.7%	10.80 [0.44 , 21.16]
Hassan 2016	83.5	6.5	30	76.7	10.6	30	13.1%	6.80 [2.35 , 11.25]
He 2020	85	22	232	74	19	236	13.5%	11.00 [7.27 , 14.73]
Maddison 2014	52.9	5.2	75	51.9	5.2	78	14.5%	1.00 [-0.65 , 2.65]
Wang 2012	80.8	13.7	68	73.2	13	65	13.0%	7.60 [3.06 , 12.14]
West 2012	65	29	795	64	30	811	14.0%	1.00 [-1.89 , 3.89]
Yu 2003	88	12	72	82	17	40	12.0%	6.00 [0.05 , 11.95]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**8.47 [3.69 , 13.24]**
Heterogeneity: Tau² = 40.31; Chi² = 83.40, df = 7 (P < 0.00001); I² = 92%								
Test for overall effect: Z = 3.47 (P = 0.0005)								
1.9.2 Physical performance								
Belardinelli 2001	76	9	59	58	14	59	16.5%	18.00 [13.75 , 22.25]
Briffa 2005	100	74.1	55	75	55.6	51	3.5%	25.00 [0.17 , 49.83]
Hassan 2016	62.5	23.4	30	50.8	20.2	30	10.1%	11.70 [0.64 , 22.76]
He 2020	80	21	232	77	22	236	16.8%	3.00 [-0.90 , 6.90]
Maddison 2014	52.6	6.6	75	50.8	6.6	78	18.0%	1.80 [-0.29 , 3.89]
Wang 2012	68.2	17.3	68	56.2	46.8	65	9.2%	12.00 [-0.10 , 24.10]
West 2012	69	31	795	67	33	811	17.4%	2.00 [-1.13 , 5.13]
Yu 2003	75	33	72	66	35	40	8.4%	9.00 [-4.26 , 22.26]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**8.08 [2.89 , 13.27]**
Heterogeneity: Tau² = 37.82; Chi² = 54.38, df = 7 (P < 0.00001); I² = 87%								
Test for overall effect: Z = 3.05 (P = 0.002)								
1.9.3 Bodily pain								
Belardinelli 2001	4	9	59	32	12	59	13.1%	-28.00 [-31.83 , -24.17]
Briffa 2005	30.2	25.9	55	20.9	32	51	11.1%	9.30 [-1.83 , 20.43]
Hassan 2016	79.6	18.4	30	67.9	15.9	30	11.9%	11.70 [3.00 , 20.40]
He 2020	71	32	232	68	30	236	12.8%	3.00 [-2.62 , 8.62]
Maddison 2014	52.4	8.2	75	51.9	8.2	78	13.3%	0.50 [-2.10 , 3.10]
Wang 2012	68.2	17.3	68	63.5	14.6	65	12.8%	4.70 [-0.73 , 10.13]
West 2012	69	28	795	68	29	811	13.3%	1.00 [-1.79 , 3.79]
Yu 2003	80	25	72	80	25	40	11.6%	0.00 [-9.66 , 9.66]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**-0.06 [-8.97 , 8.84]**
Heterogeneity: Tau² = 153.26; Chi² = 206.79, df = 7 (P < 0.00001); I² = 97%								
Test for overall effect: Z = 0.01 (P = 0.99)								
1.9.4 General health								
Belardinelli 2001	70	14	59	50	18	59	11.6%	20.00 [14.18 , 25.82]
Briffa 2005	2.7	14.8	55	2.2	16	51	11.5%	0.50 [-5.38 , 6.38]
Hassan 2016	43	7.9	30	38.5	8.8	30	13.5%	4.50 [0.27 , 8.73]
He 2020	79	23	232	72	19	236	14.0%	7.00 [3.17 , 10.83]
Maddison 2014	55.3	6.3	75	53.2	6.3	78	15.9%	2.10 [0.10 , 4.10]
Wang 2012	57.4	20.3	68	49	16.2	65	11.1%	8.40 [2.17 , 14.63]
West 2012	58	25	795	57	25	811	15.5%	1.00 [-1.45 , 3.45]
Yu 2003	64	26	72	60	28	40	6.8%	4.00 [-6.55 , 14.55]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**5.66 [2.08 , 9.25]**
Heterogeneity: Tau² = 20.00; Chi² = 43.59, df = 7 (P < 0.00001); I² = 84%								
Test for overall effect: Z = 3.10 (P = 0.002)								
1.9.5 Vitality								
Briffa 2005	11.9	22.2	55	6.9	19.6	51	10.6%	5.00 [-2.96 , 12.96]
Hassan 2016	66	11.1	30	57.7	11.7	30	13.4%	8.30 [2.53 , 14.07]
He 2020	81	17	232	73	25	236	16.0%	8.00 [4.13 , 11.87]
Maddison 2014	55.7	6.2	75	55.9	6.2	78	18.1%	-0.20 [-2.17 , 1.77]
Wang 2012	66.3	17.3	68	56.4	21.7	65	12.1%	9.90 [3.21 , 16.59]
West 2012	65	24	795	65	24	811	17.7%	0.00 [-2.35 , 2.35]
Yu 2003	79	18	72	65	17	40	12.1%	14.00 [7.29 , 20.71]



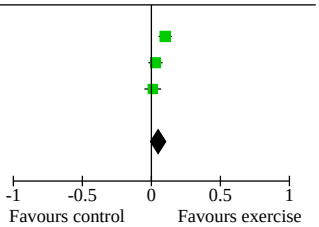
Analysis 1.9. (Continued)

West 2012	65	24	795	65	24	811	17.7%	0.00 [-2.35 , 2.35]
Yu 2003	79	18	72	65	17	40	12.1%	14.00 [7.29 , 20.71]
Subtotal (95% CI)			**1327**			**1311**	**100.0%**	**5.78 [1.89 , 9.67]**
Heterogeneity: Tau² = 20.78; Chi² = 39.47, df = 6 (P < 0.00001); I² = 85%								
Test for overall effect: Z = 2.91 (P = 0.004)								
1.9.6 Social functioning								
Belardinelli 2001	68	11	59	68	12	59	13.6%	0.00 [-4.15 , 4.15]
Briffa 2005	23.6	35.1	55	16.4	24.9	51	2.2%	7.20 [-4.32 , 18.72]
Hassan 2016	67.5	19	30	56.3	16.3	30	3.5%	11.20 [2.24 , 20.16]
He 2020	75	22	232	74	19	236	16.1%	1.00 [-2.73 , 4.73]
Maddison 2014	53.3	6.9	75	52.4	6.9	78	32.0%	0.90 [-1.29 , 3.09]
Wang 2012	71.3	21.4	68	65.8	18	65	6.0%	5.50 [-1.21 , 12.21]
West 2012	81	28	795	79	29	811	24.2%	2.00 [-0.79 , 4.79]
Yu 2003	89	27	72	82	28	40	2.5%	7.00 [-3.69 , 17.69]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**1.98 [0.26 , 3.70]**
Heterogeneity: Tau² = 1.16; Chi² = 8.71, df = 7 (P = 0.27); I² = 20%								
Test for overall effect: Z = 2.26 (P = 0.02)								
1.9.7 Emotional performance								
Briffa 2005	33.3	49.6	55	33.6	49.6	51	1.1%	-0.30 [-19.20 , 18.60]
Hassan 2016	61.1	23.4	30	49.9	19.1	30	3.3%	11.20 [0.39 , 22.01]
He 2020	65	34	232	65	33	236	9.7%	0.00 [-6.07 , 6.07]
Maddison 2014	51.4	6.9	75	51.6	6.9	78	41.8%	-0.20 [-2.39 , 1.99]
Wang 2012	80.8	37.9	68	75.9	39.7	65	2.3%	4.90 [-8.30 , 18.10]
West 2012	85	23	795	85	25	811	38.8%	0.00 [-2.35 , 2.35]
Yu 2003	93	18	72	83	35	40	2.9%	10.00 [-1.62 , 21.62]
Subtotal (95% CI)			**1327**			**1311**	**100.0%**	**0.69 [-1.33 , 2.71]**
Heterogeneity: Tau² = 1.29; Chi² = 7.32, df = 6 (P = 0.29); I² = 18%								
Test for overall effect: Z = 0.67 (P = 0.50)								
1.9.8 Mental health								
Belardinelli 2001	70	14	59	45	15	59	12.0%	25.00 [19.76 , 30.24]
Briffa 2005	3.6	18.5	55	3.9	14.2	51	11.1%	-0.30 [-6.55 , 5.95]
Hassan 2016	69.5	2.6	30	61.5	7.5	30	13.6%	8.00 [5.16 , 10.84]
He 2020	72	23	232	71	23	236	12.7%	1.00 [-3.17 , 5.17]
Maddison 2014	54.6	6.5	75	54	6.5	78	14.0%	0.60 [-1.46 , 2.66]
Wang 2012	73.5	17.1	68	65.4	20.7	65	11.0%	8.10 [1.63 , 14.57]
West 2012	76	13	795	76	13	811	14.2%	0.00 [-1.27 , 1.27]
Yu 2003	84	16	72	80	15	40	11.4%	4.00 [-1.94 , 9.94]
Subtotal (95% CI)			**1386**			**1370**	**100.0%**	**5.60 [1.21 , 9.98]**
Heterogeneity: Tau² = 34.76; Chi² = 107.11, df = 7 (P < 0.00001); I² = 93%								
Test for overall effect: Z = 2.50 (P = 0.01)								



Analysis 1.10. Comparison 1: Exercise-based rehabilitation versus control, Outcome 10: HRQoL EQ-5D at 6 to 12 months follow up

	Exercise			Control				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Campo 2020	0.75	0.13	112	0.65	0.22	110	35.4%	0.10 [0.05 , 0.15]	
Maddison 2014	0.86	0.16	75	0.83	0.16	78	34.2%	0.03 [-0.02 , 0.08]	
Sandström 2005	0.87	0.15	50	0.86	0.16	51	30.4%	0.01 [-0.05 , 0.07]	
Total (95% CI)			**237**			**239**	**100.0%**	**0.05 [-0.01 , 0.10]**	
Heterogeneity: Tau² = 0.00; Chi² = 6.47, df = 2 (P = 0.04); I² = 69%									
Test for overall effect: Z = 1.74 (P = 0.08)									
Test for subgroup differences: Not applicable									



ADDITIONAL TABLES

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up

Measure of HRQoL	Mean (SD) outcome values at follow-up		P value	Difference between groups
	Exercise	Control		
Aronov 2019				
Quality of life questionnaire developed by authors (Aronov 2002) % change of mean score at 6 months				
	Δ%	Δ%		
	30.4	“no change”	NR	
Bell 1998				
Nottingham Health Profile at 10.5 months' follow-up:				
Energy	17.6 (27.1)	18.3 (29.8)	0.87**	Exercise = Control
Pain	2.8 (8.8)	4.82 (11.9)	< 0.05	Exercise > Control
Emotional reactions	6.4 (17.0)	12.2 (19.9)	< 0.001	Exercise > Control
Sleep	7.5 (18.4)	20.5 (27.8)	< 0.001	Exercise > Control
Social isolation	2.3 (10.6)	4.0 (13.3)	0.37*	Exercise = Control
Physical mobility	8.4 (11.1)	8.9 (14.5)	0.82**	Exercise = Control
Belardinelli 2001				
SF-36 at 6 months' follow-up:				
Physical functioning	78 (19)	55 (20)	0.001	Exercise > Control
Physical performance	75 (13)	65 (14)	0.01	Exercise > Control
Bodily pain	4 (9)	22 (10)	0.001	Exercise > Control
General health	68 (14)	50 (19)	0.001	Exercise > Control
Vitality	NR	NR		
Social functioning	66 (10)	69 (12)	0.14*	Exercise = Control
Emotional performance	NR	NR		
Mental health	65 (12)	48 (15)	0.01	Exercise > Control
SF-36 at 12 months' follow-up:				
Physical functioning	82 (18)	54 (20)	0.001	Exercise > Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Physical performance	76 (9)	58 (14)	0.01	Exercise > Control
Bodily pain	4 (9)	32 (12)	0.001	Exercise > Control
General health	70 (14)	50 (18)	0.001	Exercise > Control
Vitality	NR	NR		
Social functioning	68 (11)	68 (12)	1.00*	Exercise = Control
Emotional performance	NR	NR		
Mental health	70 (14)	45 (15)	0.001	Exercise > Control
Bettencourt 2005				
SF-36 at 1 year follow-up:				
Physical functioning	70	62	NS*	Exercise = Control
Physical performance	66	57	NS*	Exercise = Control
Bodily pain	73	65	NS*	Exercise = Control
General health	57	46	< 0.02	Exercise > Control
Vitality	62	47	< 0.02	Exercise > Control
Social functioning	73	66	NS*	Exercise = Control
Emotional performance	65	58	NS*	Exercise = Control
Mental health	87	75	NS*	Exercise = Control
Mental component	71	57	0.02	Exercise > Control
Physical component	63	57	NS*	Exercise = Control
Briffa 2005				
SF-36 at 6 months' follow-up:				
	Δ (95% CI)	**Δ (95% CI)**		
Physical functioning	15.9 (-8 to 23)	7.1 (1 to 13)	NS*	Exercise = Control
Physical performance	75 (0 to 100)	75 (0 to 100)	NS*	Exercise = Control
Bodily pain	26.6 (18 to 35)	19.2 (11 to 27)	NS*	Exercise = Control
General health	0.1 (-6 to 6)	-0.6 (-5 to 4)	NS*	Exercise = Control
Vitality	7.1 (1 to 13)	3.7 (-2 to 9)	NS*	Exercise = Control
Social functioning	19.6 (10 to 29)	14.1 (7 to 21)	NS*	Exercise = Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Emotional performance	33.3 (0 to 100)	33.3 (33 to 100)	NS*	Exercise = Control
Mental health	0.5 (-4 to 5)	1.4 (-3 to 5)	NS*	Exercise = Control
SF-36 at 1 year follow-up:				
	Δ (95% CI)	**Δ (95% CI)**		
Physical functioning	17.6 (10 to 25)	6.8 (-1 to 14)	0.04	Exercise > Control
Physical performance	100 (0 to 100)	75 (12 to 30)	NS*	Exercise = Control
Bodily pain	30.2 (23 to 37)	20.9 (-2 to 7)	NS*	Exercise = Control
General health	2.7 (-3 to 5)	2.2 (-2 to 7)	NS*	Exercise = Control
Vitality	11.9 (6 to 18)	6.9 (1 to 12)	NS*	Exercise = Control
Social functioning	23.6 (14 to 33)	16.4 (9 to 23)	NS*	Exercise = Control
Emotional performance	33.3 (33 to 100)	33.3 (33 to 100)	NS*	Exercise = Control
Mental health	3.6 (-1 to 9)	3.9 (0 to 8)	NS*	Exercise = Control
Bubnova 2019				
Quality of life questionnaire developed by authors (Aronov 2002) mean (SD) score after 12 months:				
Low rehabilitation potential subgroup	-4.9 (4.5)	-7.8 (3.1)	< 0.05	Exercise > Control
Average rehabilitation potential subgroup	-5 (3.2)	-7.4 (4.3)	< 0.05	Exercise > Control
High rehabilitation potential subgroup	-4.3 (3.9)	-5.6 (4.3)	< 0.05	Exercise > Control
Bubnova 2020				
Quality of life questionnaire developed by authors (Aronov 2002) mean (%) score change at 12 months:				
	Δ (%)	**Δ (%)**		
BMI < 30 kg/m^2 group	42 (6%)	10 (2%)	<0.01	Exercise > Control
BMI ≥ 30 kg/m^2 group	27 (5%)	8 (2%)	<0.001	Exercise > Control
Campo 2020				
EuroQol at 6 months' follow-up:				
	Median (IQR)	**Median (IQR)**		
VAS (visual analogue scale)	80 (70-90)	70 (50-80)	< 0.001	Exercise > Control
5 domains	**N (%)**	**N (%)**		

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Pain/discomfort: No Moderate Extreme	103 (89) 10 (9) 3 (3)	89 (77) 24 (21) 3 (3)	0.03	Exercise > Control
Anxiety/depression: No Moderate Extreme	92 (79) 21 (18) 3 (3)	67 (58) 36 (31) 12 (10)	0.001	Exercise > Control
Mobility: No problems Some problems Confined to bed	104 (90) 12 (10) 0 (0)	80 (70) 34 (30) 1 (1)	< 0.001	Exercise > Control
Self-care: No problems Some problems Unable	114 (98) 2 (2) 0 (0)	87 (76) 25 (22) 1 (1)	0.6	Exercise = Control
Usual activities: No problems Some problems Unable	101 (87) 14 (12) 1 (1)	87 (76) 25 (22) 3 (3)	0.04	Exercise > Control
EuroQol at 12 months' follow-up:				
	Median (IQR)	**Median (IQR)**		
VAS (visual analogue scale)	75 (70-87)	65 (50-80)	< 0.001	Exercise > Control
5 domains	N (%)	N (%)		
Pain/discomfort: No Moderate Extreme	86 (77) 24 (21) 2 (2)	72 (65) 29 (26) 9 (8)	0.04	Exercise > Control
Anxiety/depression: No Moderate Extreme	83 (74) 23 (21) 6 (5)	58 (53) 37 (34) 15 (14)	0.03	Exercise > Control
Mobility: No problems Some problems Confined to bed	95 (85) 16 (14) 1 (1)	74 (67) 22 (20) 3 (3)	0.008	Exercise > Control
Self-care: No problems Some problems Unable	101 (91) 6 (5) 3 (3)	100 (91) 5 (5) 5 (5)	0.8	Exercise = Control
Usual activities: No problems Some problems Unable	99 (88) 11 (10) 2 (1)	80 (73) 24 (22) 6 (5)	0.004	Exercise > Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Dorje 2019				
SF-12 at 6 months' follow-up:				
Physical health score	46.8 (6.9)	45.2 (6.5)	0.22**	Exercise = Control
Mental health score	51.5 (9.3)	50 (8.6)	0.28**	Exercise = Control
Engblom 1992				
Nottingham Health Profile at 5 years' follow-up:				
Energy	18	25	0.08	Exercise = Control
Pain	12	18	0.07	Exercise = Control
Emotional reactions	14	21	0.27	Exercise = Control
Sleep	24	29	0.42	Exercise = Control
Social isolation	7	9	0.42	Exercise = Control
Physical mobility	6	14	0.005	Exercise > Control
Hassan 2016				
SF-36 8 domains at 12 months' follow-up				
Physical functioning	83.5 (6.5)	76.7 (10.6)	0.01	Exercise > Control
Role limitations physical	62.5 (23.4)	50.8 (20.2)	0.04	Exercise > Control
Role limitations emotional	61.1 (21.6)	49.9 (19.1)	0.04	Exercise > Control
Energy/fatigue	66 (11.1)	57.7 (11.7)	0.01	Exercise > Control
Emotional well being	69.5 (2.6)	61.5 (7.5)	0.000	Exercise > Control
Social functioning	67.5 (19)	56.3 (16.3)	0.02	Exercise > Control
Pain	79.6 (18.4)	67.9 (15.9)	0.01	Exercise > Control
General health	43 (7.9)	38.5 (8.8)	0.04	Exercise > Control
Hautala 2017				
15D Quality of life measure at 6 months' follow-up:				
	0.915 (0.07)	0.876 (0.084)	0.0004*	Exercise > Control
15D Quality of life measure at 12 months' follow-up:				
	0.922 (0.072)	0.886 (0.088)	< 0.0015*	Exercise > Control
He 2020				

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

SF-36 at 12 months:				
Physical functioning	85 (22)	74 (19)	< 0.01	Exercise > Control
Role-physical	80 (21)	77 (22)	0.362	Exercise = Control
Bodily pain	71 (32)	68 (30)	0.348	Exercise = Control
General health	79 (23)	72 (19)	< 0.01	Exercise > Control
Vitality	81 (17)	73 (25)	< 0.01	Exercise > Control
Social functioning	75 (22)	74 (19)	0.902	Exercise = Control
Role-emotional	65 (34)	65 (33)	0.976	Exercise = Control
Mental health	72 (23)	71 (23)	0.825	Exercise = Control
Physical health score	79 (29)	73 (29)	< 0.01	Exercise > Control
Mental health score	73 (28)	71 (27)	0.102	Exercise = Control
Heller 1993				
QLMI at 6 months' follow-up:				
Emotional	5.4 (1.1)	5.2 (1.2)	0.04	Exercise > Control
Physical	5.4 (1.2)	5.2 (1.3)	0.17*	Exercise = Control
Social	5.9 (1.1)	5.8 (1.1)	0.35*	Exercise = Control
Hofman-Bang 1999				
AP-QLQ at 12 months' follow-up:				
Physical activity	4.9	4.3	< 0.05	Exercise > Control
Somatic symptoms	NR	NR	NS	Exercise = Control
Emotional distress	NR	NR	NS	Exercise = Control
Life satisfaction	NR	NR	NS	Exercise = Control
Houle 2012				
Quality of Life Index - cardiac version III at 6 months' follow-up:				
Health and functional score	26 (5.1)	24.5 (5.3)	0.048	Exercise > Control
Psychological/spiritual score	25.6 (5.8)	25.5 (3.8)	0.383	Exercise = Control
Social and economic score	25.7 (3.8)	25.4 (4.7)	0.392	Exercise = Control
Family score	28.1 (2.5)	26.7 (4.3)	0.048	Exercise > Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Overall	26.2 (4.3)	25.8 (4.1)	0.057	Exercise = Control
Quality of Life Index - cardiac version III at 12 months' follow-up:				
Health and functional score	27.8 (2.0)	25.3 (4.6)	0.036	Exercise > Control
Psychological/spiritual score	27.4 (2.5)	26.2 (4.0)	0.336	Exercise = Control
Social and economic score	27.2 (3.0)	25.9 (5.2)	0.638	Exercise = Control
Family score	28 (2.6)	26.8 (5.0)	0.092	Exercise = Control
Overall	27.7 (2.1)	25.7 (4.2)	0.048	Exercise > Control
Ma 2020				
SF-12 change at 12 months' follow-up:				
	Δ (SD)	**Δ (SD)**		
Physical component	13.3 (6)	9.9 (5.9)	< 0.001	Exercise > Control
Mental component	12.4 (5.4)	9 (6.2)	< 0.001	Exercise > Control
Maddison 2014				
EQ-5D at 24 weeks' follow-up:				
	0.86	0.83	0.23	Exercise = Control
SF-36 at 24 weeks' follow-up:				
Physical functioning	52.9	51.9	0.20	Exercise = Control
Role physical	52.6	50.8	0.08	Exercise = Control
Bodily pain	52.4	51.9	0.71	Exercise = Control
General health	55.3	53.2	0.03	Exercise > Control
Vitality	55.7	55.9	0.79	Exercise = Control
Social Functioning	53.3	52.4	0.42	Exercise = Control
Role emotional	51.4	51.6	0.81	Exercise = Control
Mental health	54.6	54.0	0.61	Exercise = Control
Mutwalli 2012				
SF-36 Health status score at 6 months' follow-up:				
	90.14 (4.83)	60.55 (16.21)	0.000	Exercise > Control
Oerkild 2012				

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

SF-36 at 12 months' follow-up:				
	Δ (95% CI)	**Δ (95% CI)**		
SF 12 PCS	-1.1 (-5.3 to 3.1)	-1.4 (-5.2 to 2.3)	NS*	Exercise = Control
SF 12 MCS	-1.4 (-6.1 to 3.3)	-0.3 (-4.6 to 4.0)	NS*	Exercise = Control
Oldridge 1991				
QLMI at 4 months' follow-up:				
Limitations	54	54	NS	Exercise = Control
Emotions	103	101	NS	Exercise = Control
QLMI at 8 months' follow-up:				
Limitations	54	54	NS	Exercise = Control
Emotions	103	103	NS	Exercise = Control
QLMI at 12 months' follow-up:				
Limitations	54	55	NS	Exercise = Control
Emotions	105	102	NS	Exercise = Control
Reid 2012				
MacNew at 6 months' follow-up:				
Global score	5.8 (0.6)	5.6 (0.8)	0.112	Exercise = Control
Emotional subscale	5.6 (0.6)	5.4 (0.7)	0.038	Exercise > Control
Social subscale	6.3 (0.8)	6.0 (1.0)	0.162	Exercise = Control
Physical subscale	6.0 (0.8)	5.8 (1.0)	0.031	Exercise > Control
Sandstrom 2005				
Time Trade Off (TTO) at 12 months' follow-up:				
	0.86 (0.23)	0.85 (0.21)	NS*	Exercise = Control
EuroQol Part one at 12 months' follow-up:				
	0.87 (0.15)	0.86 (0.16)	NS*	Exercise = Control
EuroQol Part two at 12 months' follow-up:				
	7.6 (1.46)	7.43 (1.46)	NS*	Exercise = Control
Santaularia 2017				

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

EuroQol-5D at 12 months' follow-up:				
	N (%)	N(%)		
Mobility No problems Problems	33 (84.6) 6 (15.4)	33 (75) 11 (25)	0.019	Exercise > Control
Self-care No problems Problems	38 (97.4) 1 (2.6)	43 (97.7) 1 (2.3)	0.172	Exercise = Control
Usual activities No problems Problems	32 (82) 7 (18)	31 (70.5) 13 (29.5)	0.803	Exercise = Control
Pain/discomfort No problems Problems	28 (71.8) 11 (28.2)	26 (59.1) 18 (40.9)	0.528	Exercise = Control
Anxiety/depression No problems Problems	22 (56.4) 17 (43.6)	26 (59.1) 18 (40.9)	0.429	Exercise = Control
Snoek 2020				
SF-36 summary scores at 6 months:				
Physical	50.2 (7.2)	48.3 (7.5)	0.086*	Exercise = Control
Mental	54.0 (8.4)	52.7 (9.1)	0.322*	Exercise = Control
SF-36 summary scores at 12 months:				
Physical	50.6 (7.2)	49 (8.2)	0.167*	Exercise = Control
Mental	53.2 (8.8)	52.5 (9.2)	0.604*	Exercise = Control
Stahle 1999				
Karolinska Questionnaire at 12 months' follow-up:				
Chest pain	0.6 (1.2)	0.4 (1.3)	NS	Exercise = Control
Shortness of breath	0.4 (1.1)	0.2 (1.0)	NS	Exercise = Control
Dizziness	-0.1 (1.1)	0.2 (0.9)	NS	Exercise = Control
Palpitation	-0.1 (1.0)	0.1 (0.9)	NS	Exercise = Control
Cognitive ability	-0.1 (0.6)	0.0 (0.7)	NS	Exercise = Control
Alertness	0.0 (0.9)	0.1 (0.8)	NS	Exercise = Control
Quality of sleep	0.0 (0.5)	0.1 (0.5)	NS	Exercise = Control
Physical ability	0.2 (0.7)	0.1 (0.4)	NS	Exercise = Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Daily activity	0.3 (0.5)	0.1 (0.5)	NS	Exercise = Control
Depression	0.1 (0.3)	0.1 (0.2)	NS	Exercise = Control
Self-perceived health	0.5 (1.3)	0.3 (1.0)	NS	Exercise = Control
"Ladder of Life" present	1.2 (1.2)	0.9 (1.8)	NS	Exercise = Control
"Ladder of Life" future	0.8 (2.7)	0.4 (2.3)	NS	Exercise = Control
Fitness	0.6 (1.4)	0.4 (1.0)	NS	Exercise = Control
Physical ability	0.7 (1.0)	0.4 (1.1)	NS	Exercise = Control
Toobert 2000				
SF-36 at 24 months' follow-up:				
Physical functioning	NR	NR	NS	Exercise = Control
Physical performance	NR	NR	NS	Exercise = Control
Bodily pain	NR	NR	NS	Exercise = Control
General health	NR	NR	< 0.05	Exercise > Control
Vitality	NR	NR	NS	Exercise = Control
Social functioning	NR	NR	< 0.05	Exercise > Control
Emotional performance	NR	NR	NS	Exercise = Control
Mental health	NR	NR	NS	Exercise = Control
Uddin 2020				
WHOQoL-BREF at 12 months' follow-up				
Overall perception of HRQoL	4.03 (0.49)	3.2 (0.82)	< 0.01	Exercise > Control
Overall perception of health	4.06 (0.4)	3.17 (0.38)	< 0.01	Exercise > Control
Physical domain	26.9 (2.88)	21.17 (3.35)	< 0.01	Exercise > Control
Psychological domain	23.42 (2.84)	17.87 (3.19)	< 0.01	Exercise > Control
Social relationship domain	11.83 (1.5)	10.75 (0.89)	< 0.01	Exercise > Control
Environmental domain	28.8 (4.24)	21.77 (5.31)	0.03	Exercise > Control
Wang 2012				
SF-36 at 6 months' follow-up:				
Physical functioning	80.8 (13.7)	73.2 (13.0)	< 0.001	Exercise > Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Physical performance	68.2 (17.3)	56.2 (46.8)	0.015	Exercise > Control
Bodily pain	68.2 (17.3)	63.5 (14.6)	0.012	Exercise > Control
General health	57.4 (20.3)	49.0 (16.2)	0.017	Exercise > Control
Vitality	66.3 (17.3)	56.4 (21.7)	0.002	Exercise > Control
Social functioning	71.3 (21.4)	65.8 (18.0)	0.031	Exercise > Control
Emotional performance	80.8 (37.9)	75.9 (39.7)	0.12	Exercise = Control
Mental health	73.5 (17.1)	65.4 (20.7)	0.011	Exercise > Control
MIDAS at 6 months' follow-up:				
Physical Activity	37.7 (11.2)	42.6 (12.3)	< 0.001	Exercise > Control
Insecurity	28.7 (9.7)	33.4 (13.8)	< 0.001	Exercise > Control
Emotional reaction	30.4 (12.8)	34.8 (14.4)	0.008	Exercise > Control
Dependency	27.6 (9.4)	31.8 (16.6)	0.001	Exercise > Control
Diet	36.8 (15.4)	43.6 (20.7)	0.40	Exercise = Control
Concerns over meds	29.4 (12.6)	37.7 (18.0)	<0.001	Exercise > Control
Side Effects	28.2 (11.1)	30.8 (14.3)	0.30	Exercise > Control
West 2012				
SF-36 at 12 months' follow-up:				
Physical function	65 (29)	64 (30)	NS*	Exercise = Control
Role physical	69 (31)	67 (33)	NS*	Exercise = Control
Role emotional	85 (23)	85 (25)	NS*	Exercise = Control
Social function	81 (28)	79 (29)	NS*	Exercise = Control
Mental health	76 (13)	76 (13)	NS*	Exercise = Control
Energy /vitality	65 (24)	65 (24)	NS*	Exercise = Control
Pain	69 (28)	68 (29)	NS*	Exercise = Control
Health Perception	58 (25)	57 (25)	NS*	Exercise = Control
Yu 2003				
SF-36 at 8 months' follow-up:				
Physical functioning	88 (12)	82 (17)	0.03*	Exercise > Control

Table 1. Summary of health-related quality of life (HRQoL) scores at follow-up *(Continued)*

Physical performance	75 (33)	66 (35)	0.18*	Exercise = Control
Bodily pain	80 (25)	80 (25)	1.00*	Exercise = Control
General health	64 (26)	60 (28)	0.45*	Exercise = Control
Vitality	79 (18)	65 (17)	0.0001	Exercise > Control
Social functioning	89 (27)	82 (28)	0.15	Exercise = Control
Emotional performance	93 (18)	83 (35)	0.05	Exercise = Control
Mental health	84 (16)	80 (15)	0.2	Exercise = Control
SF-36 at 24 months' follow-up:				
Physical functioning	88 (13)	87 (9)	0.67*	Exercise = Control
Physical performance	80 (32)	79 (30)	0.87*	Exercise = Control
Bodily pain	81 (21)	85 (20)	0.33*	Exercise = Control
General health	64 (20)	61 (18)	0.43*	Exercise = Control
Vitality	73 (21)	73 (17)	1.00*	Exercise = Control
Social functioning	79 (30)	90 (18)	0.04*	Exercise > Control
Emotional performance	89 (25)	93 (25)	0.42*	Exercise = Control
Mental health	85 (14)	85 (12)	1.00*	Exercise = Control
Zwisler 2008				
SF-36 at 12 months' follow-up:				
Physical Component Score	45.2 (9.8)	46.4 (9.8)	0.39*	Exercise = Control
Mental Component Score	50.6 (10.8)	48.4 (11.5)	0.16*	Exercise = Control

AP-QLQ: Angina Pectoris-Quality of Life questionnaire
BMI: body mass index
EQ-5D: five-dimension EuroQol scale
EuroQoL: European Quality of Life Scale
IQR: interquartile range
MIDAS: Myocardial Infarction Dimensional Assessment Scale
NR: not reported
NS: not significant
QLMI: Quality of Life After Myocardial Infarction questionnaire
SD: standard deviation
SF-36: Short Form 36-item questionnaire
WHOQoL-BREF: World Health Organization Quality of Life abbreviated instrument
* Calculated by authors of this report based on independent two group t test.
** Adjusted for baseline difference between groups.
Exercise = Control: no statistically significant difference (P > 0.05) between exercise and Control groups at follow up
Exercise > Control: statistically significant difference (P < 0.05) between exercise and Control groups at follow up

NS*: The authors of this review have inferred a P value of > 0.05 based either on the 95% CI, or from narrative in the paper, rather than from directly observing the P-value.

Table 2. Summary of costs of exercise-based rehabilitation and usual care

Author/ year	Briffa 2005	Hambrecht 2004	Hautala 2017	Kovoor 2006/Hall 2002	Maddison 2014	Marchionni 2003	Oldridge 1991/93	Yu 2004
Follow-up (months)	12	12	12	12	6	14	12	24
Year of costs (currency)	1998 (Australian dollars - AUD)	NR (US dollars - USD)	NR (euros - EUR)	1999 (Australian dollars - AUD)	NR (euros - EUR)	2000 (US dollars - USD)	1991 (US dollars - USD)	2003 (US dollars - USD)
Cost of rehabilitation								
Mean cost/patient	AUD 694	NR	EUR 299	AUD 394	EUR 127	USD 5246	USD 670	NR
Costs considered	Details of costed elements not provided	NR	Estimated according to the average monthly fees in Finnish gyms where individual guidance in exercise training is led by a health care professional	staff, assessments, counselling, education, patient travel	NR	NR	space, equipment, staff, literature resources, operating costs, parking, patients costs	NR
Total healthcare costs								
Rehabilitation mean cost/patient	AUD 4937	USD 3708 ± 156	EUR 1944	NR	NR	USD 17,272	NR	USD 15,292
Usual care mean cost/patient	AUD 4541	USD 6086 ± 370	EUR 3027	NR	NR	USD 12,433	NR	USD 15,707
Absolute difference in mean cost/patient*	AUD 395	USD -2378	EUR -1083	NR	NR	USD 4839	USD 480	USD -415
P value for cost difference	0.74	P < 0.001	NR	P > 0.05 (see below)	NR	NR	NR	P > 0.05
Additional healthcare costs considered	Hospitalisations, pharmaceuticals, tests, consultations, rehabili-	Rehospitalisations, revascularisation, cycle	Primary health care costs, secondary health care costs, occupational	Phone calls (P = 0.10); hospital admissions (P = 0.11); gated heart pool	NR	NR	Service utilisation, physician costs, emergency	Hospitalisations; revascularisations; pri-

Table 2. Summary of costs of exercise-based rehabilitation and usual care *(Continued)*

	tation, patient expenses, ambulance	ergometers, training facilities, and supervising staff	health care service costs	scan (P = 0.50); exercise stress test (P = 0.72); other diagnostics (P = 0.37); visits to general practitioner (P = 0.61), specialist doctor (P = 0.35), or health-care professional (P = 0.31)			costs, in-patient days, allied health, other rehabilitation visits	vate clinic visit; cardiac clinic visits; public non-cardiac visits; casualty visits; drugs
Cost-effectiveness								
Rehabilitation mean health care benefits	Utility-based quality of life – heart questionnaire: 0.026 (95% CI 0.013 to 0.039)	NR	Average change in 15D utility: 0.013	NR	NR	NR	NR	NR
Usual care mean health care benefit	Utility 0.010 (95% CI -0.001 to 0.022)	NR	Average change in 15D utility: -0.012	NR	NR	NR	NR	NR
Incremental mean health care benefit	Utility 0.013 (95% CI, NR) P = 0.38; +0.009 QALYs	NR	0.045 QALYs (0.023-0.077)	NR	NR	NR	0.052 QALYs (95% CI, 0.007 to 0.1)	0.06 QALYs
Incremental cost effectiveness ratio/patient	AUD +42,535 per QALY. Extensive sensitivity analyses reported.	NR	EUR -24,511 per QALY	NR	EUR +15,247 per QALY	NR	USD +9200 per QALY	USD -650 per QALY

NR: not reported
QALY: quality-adjusted life year
* The currency for Hambrecht 2004 is not reported, but healthcare costs are reported within the paper with $

Table 3. Results for univariate meta-regression for all-cause mortality

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 46)	RR = 1.00	1.00 to 1.00, P = 0.15	56.1%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average min/session) (n = 33)	RR = 1.00	1.00 to 1.00, P = 0.11	100%	No evidence that risk ratio is associated with type of CR
Duration of follow-up (months) (n = 47)	RR = 1.00	1.00 to 1.00, P = 0.07	100%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 47)	RR = 1.04	0.84 to 1.31, P = 0.70	-27.1%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 47)	RR = 0.84	0.70 to 0.99, P = 0.04	100%	No evidence that risk ratio is associated with publication year
CR setting (n = 47)	RR = 0.95	0.82 to 1.24, P = 0.95	-11.3%	No evidence that risk ratio is associated with type of CR
Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 47)	RR = 1.02	0.94 to 1.09, P = 0.67	-68.55%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 47)	RR = 1.01	0.86 to 1.19, P = 0.93	-41.24%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high-income country (n = 47)	RR = 1.02	0.70 to 1.48, P = 0.93	-45.10%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 47)	RR = 1.19	0.73 to 1.93, P = 0.47	16.07%	No evidence that risk ratio is associated with study sample size

Table 4. Results of univariate meta-regression analysis for cardiovascular mortality

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 27)	RR = 1.00	0.99 to 1.01, P = 0.76	-8.74%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x aver-	RR = 1.00	1.00 to 1.00, P = 0.62	0%	No evidence that risk ratio is associated with dose of exercise

Table 4. Results of univariate meta-regression analysis for cardiovascular mortality *(Continued)*

age number of sessions/week x average min/session) (n = 22)				
Duration of follow-up (months) (n = 28)	RR = 0.99	0.99 to 1.00, P = 0.05	90.36%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 28)	RR = 0.83	0.62 to 1.10, P = 0.18	75.69%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 28)	RR = 1.37	0.89 to 2.13, P = 0.15	63.31%	No evidence that risk ratio is associated with publication year
Setting (centre vs home) (n = 28)	RR = 1.05	0.88 to 1.24, P = 0.61	-29.66%	No evidence that risk ratio is associated with setting of CR
Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 28)	RR = 0.90	0.73 to 1.11, P = 0.30	85.73%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 28)	RR = 1.02	0.75 to 1.39, P = 0.89	-41.75%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high-income country (n = 28)	RR = 0.69	0.22 to 2.19, P = 0.52	9.36%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 28)	RR = 1.28	0.69 to 2.37, P = 0.42	28.43%	No evidence that risk ratio is associated with study sample size

Table 5. Results of univariate meta-regression analysis for fatal and/or non-fatal MI

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 41)	RR = 1.00	0.99 to 1.01, P = 0.93	-4.57%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average min/session) (n = 33)	RR = 1.00	1.00 to 1.00, P = 0.68	0%	No evidence that risk ratio is associated with dose of exercise
Duration of follow-up (months) (n = 41)	RR = 1.00	0.99 to 1.01, P = 0.97	-12.45%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 41)	RR = 0.85	0.58 to 1.25, P = 0.39	9.68%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 41)	RR = 1.36	0.94 to 1.97, P = 0.11	25.40%	No evidence that risk ratio is associated with publication year
Setting (centre vs home) (n = 39)	RR = 0.80	0.67 to 0.95, P = 0.01	67.62%	No evidence that risk ratio is associated with setting of CR

Table 5. Results of univariate meta-regression analysis for fatal and/or non-fatal MI *(Continued)*

Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 41)	RR=1.39	0.85 to 2.26, P = 0.18	-16.70%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 41)	RR = 0.71	0.49 to 1.05, P = 0.09	12.94%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high income country (n = 41)	RR = 0.65	0.33 to 1.61, P = 0.20	0.86%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 41)	RR = 1.69	1.05 to 2.72, P = 0.03	54.95%	No evidence that risk ratio is associated with study sample size

Table 6. Results of univariate meta-regression analysis for CABG

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 31)	RR = 1.01	1.00 to 1.02, P = 0.05	0%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average min/session) (n = 25)	RR = 1.00	1.00 to 1.00, P = 0.78	0%	No evidence that risk ratio is associated with dose of exercise
Duration of follow-up (months) (n = 31)	RR = 1.00	0.99 to 1.01, P = 0.75	0%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 31)	RR = 1.04	0.67 to 1.61, P = 0.86	0%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 31)	RR = 0.88	0.56 to 1.41, P = 0.59	0%	No evidence that risk ratio is associated with publication year
Setting (centre vs home) (n = 31)	RR = 1.07	0.87 to 1.33, P = 0.51	0%	No evidence that risk ratio is associated with setting of CR
Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 31)	RR = 0.94	0.64 to 1.38, P = 0.73	0%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 31)	RR = 1.19	0.83 to 1.71, P = 0.34	0%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high income country (n = 31)	RR = 0.51	0.08 to 3.18, P = 0.46	0%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 31)	RR = 1.31	0.82 to 2.09, P = 0.25	0%	No evidence that risk ratio is associated with study sample size

Table 7. Results of univariate meta-regression for PCI

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 18)	RR = 1.00	1.00 to 1.01, P = 0.50	0%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x average number of sessions/week x average min/session) (n = 16)	RR = 1.00	1.00 to 1.00, P = 0.50	0%	No evidence that risk ratio is associated with dose of exercise
Duration of follow-up (months) (n = 18)	RR = 1.00	0.99 to 1.01, P = 0.82	0%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 18)	RR = 0.78	0.38 to 1.59, P = 0.47	0%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 18)	RR = 0.95	0.46 to 1.95, P = 0.87	0%	No evidence that risk ratio is associated with publication year
Setting (centre vs home) (n = 18)	RR = 0.91	0.72 to 1.15, P = 0.41	0%	No evidence that risk ratio is associated with setting of CR
Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 18)	RR = 1.09	0.72 to 1.66, P = 0.67	0%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 18)	RR = 0.81	0.53 to 1.23, P = 0.30	0%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high income country (n = 18)	RR = 0.29	0.05 to 1.63, P = 0.15	0%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 18)	RR = 1.19	0.70 to 2.01, P = 0.49	0%	No evidence that risk ratio is associated with study sample size

Table 8. Results of univariate meta-regression for all-cause hospitalisation

Explanatory variable (n trials)	Exp (slope)*	95% confidence interval, P value	Proportion of variance explained (adjusted R^2)	Interpretation
Case mix (% MI patients) (n = 23)	RR = 1.00	1.00 to 1.01, P = 0.71	-20.91%	No evidence that risk ratio is associated with case mix
Dose of exercise (number of weeks of exercise training x aver-	RR = 1.00	1.00 to 1.00, P = 0.44	-69.78%	No evidence that risk ratio is associated with dose of exercise

Table 8. Results of univariate meta-regression for all-cause hospitalisation *(Continued)*

age number of sessions/week x average min/session) (n = 19)				
Duration of follow-up (months) (n = 23)	RR = 1.01	1.00 to 1.01, P = 0.07	56.52%	No evidence that risk ratio is associated with length of follow-up
Type of CR (exercise only vs comprehensive CR) (n = 23)	RR = 0.93	0.65 to 1.33, P = 0.70	-50.20%	No evidence that risk ratio is associated with type of CR
Year of publication (pre-1995 vs post-1995) (n = 23)	RR = 1.12	0.80 to 1.57, P = 0.48	-32.69%	No evidence that risk ratio is associated with publication year
Setting (centre vs home) (n = 23)	RR = 0.94	0.83 to 1.06, P = 0.28	-36.70%	No evidence that risk ratio is associated with setting of CR
Risk of bias (low risk in ≤ 3 items vs > 3 items) (n = 23)	RR = 1.00	0.71 to 1.40, P = 0.99	-44.14%	No evidence that risk ratio is associated with risk of bias
Study location (continent - Europe, North America, Australia/Asia or Other) (n = 23)	RR = 0.86	0.69 to 1.08, P = 0.18	-137.18%	No evidence that risk ratio is associated with study location
Low- and middle-income country (LMIC) vs high income country (n = 23)	RR = 1.06	0.72 to 1.55, P = 0.76	-49.12%	No evidence that risk ratio is associated with LMIC
Sample size (≤ 150 vs > 150) (n = 19)	RR = 1.45	1.08 to 1.96, P = 0.02	100%	No evidence that risk ratio is associated with study sample size

APPENDICES

Appendix 1. Glossary of terms used in this review

Angina pectoris: commonly known as angina, is the sensation of chest pain, pressure, or squeezing, often due to ischaemia of the heart muscle from obstruction or spasm of the coronary arteries.

Angioplasty: a treatment to expand a narrowed artery.

Arrhythmia: an abnormal heart rhythm.

Atheroma: the fatty material that can build up within the walls of your arteries.

Atherosclerosis: the build-up of fatty materials within the walls of your arteries, causing them to narrow.

Cardiovascular: to do with the heart and blood vessels.

Coronary artery bypass surgery: also known as coronary artery bypass graft (CABG) surgery, and colloquially as heart bypass or bypass surgery, is a surgical procedure to improve the blood supply to the heart.

Coronary heart disease (CHD): also known as coronary artery disease (CAD), ischaemic heart disease (IHD), or atherosclerotic heart disease, is a group of diseases that includes: stable angina, unstable angina, myocardial infarction and sudden coronary death. It is caused when the walls of your coronary arteries become narrowed by a gradual build-up of atheroma, allowing too little blood flow to the heart from the coronary arteries.

Echocardiogram: often referred to as a cardiac echo or simply an echo, is a sonogram of the heart. Echocardiography uses standard two-dimensional, three-dimensional, and Doppler ultrasound to create images of the heart.

Electrocardiogram (ECG): is a test that checks for problems with the electrical activity of your heart. An ECG shows the heart's electrical activity as line tracings on paper. The spikes and dips in the tracings are called waves. The heart is a muscular pump made up of four chambers.

Heart attack: myocardial infarction (MI) or acute myocardial infarction (AMI), occurs when blood flow stops to a part of the heart, starving it of oxygen and causing damage to the heart muscle.

Heart failure (HF): often referred to as congestive heart failure (CHF), occurs when the heart is unable to pump sufficiently to maintain blood flow to meet the needs of your body.

Heart rate: The number of times your heart beats in a minute.

Implantable cardiovertor defibrillator (ICD): a device implanted within your chest wall to monitor your heart's rhythm. If there is a dangerous, abnormal rhythm, the ICD can treat it by giving your heart an electric shock.

Intermittent claudication: A cramp-like pain, mostly in your calf and leg muscles, which is caused by a lack of oxygen in the blood. It is often brought on by walking and relieved by rest.

Ischaemia: a restriction in blood supply to tissues, causing a shortage of the oxygen and glucose needed.

Ischaemic heart disease (IHD): see coronary heart disease (CHD).

Myocardial infarction (MI) or acute myocardial infarction (AMI): commonly known as a heart attack, occurs when blood flow stops to a part of the heart, causing damage to the heart muscle.

Percutaneous coronary intervention (PCI): commonly known as coronary angioplasty, is a non-surgical procedure used to treat the stenotic (narrowed) coronary arteries of the heart found in coronary heart disease.

Revascularisation: a procedure that either opens up the existing blood vessels or bypasses the blockage of the coronary arteries.

Risk factor for coronary heart disease: something that can increase your risk of getting coronary heart disease. Risk factors include smoking, high blood pressure, raised cholesterol, physical inactivity, obesity, diabetes, your sex, your ethnic background, your age and whether you have a family history of heart disease.

ST segment: is the flat, isoelectric section of the ECG trace, between the end of the S wave (the J point) and the beginning of the T wave.

Appendix 2. Search strategies

CENTRAL

#1 MeSH descriptor: [Myocardial Ischemia] explode all trees

#2 (myocard* near isch*mi*):ti,ab,kw

#3 isch*mi* near heart:ti,ab,kw

#4 MeSH descriptor: [Coronary Artery Bypass] explode all trees

#5 myocard* near infarct*:ti,ab,kw

#6 heart near infarct*:ti,ab,kw

#7 angina:ti,ab,kw

#8 coronary near (disease* or bypass or thrombo* or angioplast*):ti,ab,kw

#9 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees

#10 (percutaneous next coronary near/2 (interven* or revascular*))

#11 MeSH descriptor: [Angioplasty] explode all trees

#12 angioplast*

#13 ((coronary or arterial) near/4 dilat*)

#14 endoluminal next repair*

#15 MeSH descriptor: [Stents] explode all trees

#16 stent*

#17 pci or ptca

#18 MeSH descriptor: [Atherectomy] explode all trees

#19 atherectom*

#20 acute next coronary next syndrom*

#21 (NSTEMI or STEMI)

#22 ACS

#23 #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

#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

#25 MeSH descriptor: [Exercise Therapy] explode all trees

#26 MeSH descriptor: [Sports] explode all trees

#27 MeSH descriptor: [Physical Exertion] explode all trees

#28 rehabilitat*:ti,ab,kw

#29 (physical* near (fit* or train* or therap* or activit*)):ti,ab,kw

#30 MeSH descriptor: [Exercise] explode all trees

#31 (train*) near (strength* or aerobic* or exercise*):ti,ab,kw

#32 ((exercise* or fitness) near/3 (treatment or intervent* or program*)):ti,ab,kw

#33 MeSH descriptor: [Rehabilitation] explode all trees

#34 kinesiotherap*:ti,ab,kw

#35 MeSH descriptor: [Physical Education and Training] explode all trees

#36 MeSH descriptor: [Patient Education as Topic] this term only

#37 (patient* near/5 educat*)

#38 ((lifestyle or life-style) near/5 (interven* or program* or treatment*))

#39 MeSH descriptor: [Self Care] this term only

#40 (self near/5 (manag* or care or motivate*))

#41 MeSH descriptor: [Psychotherapy] explode all trees

#42 psychotherap*

#43 (psycholog* near/5 intervent*)

#44 MeSH descriptor: [Counseling] this term only

#45 (counselling or counseling)

#46 ((behavior* or behaviour*) near/5 (modify or modificat* or therap* or change))

#47 (psycho-educat* or psychoeducat*)

#48 (motivat* near/5 (intervention or interv*))

#49 MeSH descriptor: [Health Education] this term only

#50 (health near/5 educat*)

#51 (psychosocial or psycho-social)

#52 (cognitive near/2 behav*)

#53 #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 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52

#54 #23 and #53 in Trials

#55 #24 and #53 in Trials

#56 #55 not #54 in Trials

#57 #23 and #53 with Publication Year from 2014 to 2020, in Trials

#58 #56 or #57

MEDLINE OVID

1 exp Myocardial Ischemia/

2 (myocard* adj5 (ischaemia or ischemia)).tw.

3 (isch?emi* adj5 heart).tw.

4 exp Coronary Artery Bypass/

5 (myocard* adj5 infarct*).tw.

6 (heart adj5 infarct*).tw.

7 angina.tw.

8 (coronary adj5 (disease* or bypass or thrombo* or angioplast*)).tw.

9 exp Percutaneous Coronary Intervention/

10 (percutaneous coronary adj2 (interven* or revascular*)).tw.

11 exp Angioplasty/

12 angioplast*.tw.

13 ((coronary or arterial) adj4 dilat*).tw.

14 endoluminal repair*.tw.

15 exp Stents/

16 stent*.tw.

17 (pci or ptca).tw.

18 exp Atherectomy/

19 atherectom*.tw.

20 acute coronary syndrom*.tw.

21 (NSTEMI or STEMI).tw.

22 ACS.tw.

23 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

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

25 exp Exercise Therapy/

26 Sports/

27 Physical Exertion/

28 rehabilitat*.mp.

29 (physical* adj5 (fit* or train* or therap* or activit*)).mp.

30 exp Exercise/

31 (train* adj5 (strength* or aerobic* or exercise*)).tw.

32 ((exercise* or fitness) adj3 (treatment or intervent* or program*)).tw.

33 exp Rehabilitation/

34 kinesiotherap*.tw.

35 "Physical Education and Training"/

36 Patient Education as Topic/

37 (patient* adj5 educat*).tw.

38 ((lifestyle or life-style) adj5 (interven* or program* or treatment*)).tw.

39 Self Care/

40 (self adj5 (manag* or care or motivate*)).tw.

41 exp Psychotherapy/

42 psychotherap*.tw.

43 (psycholog* adj5 intervent*).tw.

44 Counseling/

45 (counselling or counseling).tw.

46 ((behavior* or behaviour*) adj5 (modify or modificat* or therap* or change)).tw.

47 (psycho-educat* or psychoeducat*).tw.

48 (motivat* adj5 (intervention or interv*)).tw.

49 Health Education/

50 (health adj5 educat*).tw.

51 (psychosocial or psycho-social).tw.

52 (cognitive adj2 behav*).tw.

53 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 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52

54 randomized controlled trial.pt.

55 controlled clinical trial.pt.

56 randomized.ab.

57 placebo.ab.

58 drug therapy.fs.

59 randomly.ab.

60 trial.ab.

61 groups.ab.

62 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61

63 exp animals/ not humans.sh.

64 62 not 63

65 23 and 53 and 64

66 24 and 53 and 64

67 limit 65 to ed=20140702-20200901

68 66 not 65

69 67 or 68

Embase OVID

1 exp Heart Muscle Ischemia/

2 (myocard* adj5 (ischaemia or ischemia)).tw.

3 (isch?emi* adj5 heart).tw.

4 exp Coronary Artery Bypass Graft/

5 (myocard* adj5 infarct*).tw.

6 (heart adj5 infarct*).tw.

7 angina.tw.

8 (coronary adj5 (disease* or bypass or thrombo* or angioplast*)).tw.

9 exp percutaneous coronary intervention/

10 (percutaneous coronary adj2 (interven* or revascular*)).tw.

11 exp angioplasty/

12 angioplast*.tw.

13 ((coronary or arterial) adj4 dilat*).tw.

14 endoluminal repair*.tw.

15 exp stent/

16 stent*.tw.

17 (pci or ptca).tw.

18 exp atherectomy/

19 atherectom*.tw.

20 acute coronary syndrom*.tw.

21 (NSTEMI or STEMI).tw.

22 ACS.tw.

23 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

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

25 exp Kinesiotherapy/

26 Sport/

27 rehabilitat*.mp.

28 (physical* adj5 (fit* or train* or therap* or activit*)).mp.

29 exp Exercise/

30 (train* adj5 (strength* or aerobic* or exercise*)).tw.

31 ((exercise* or fitness) adj3 (treatment or intervent* or program*)).tw.

32 exp Rehabilitation/

33 kinesiotherap*.tw.

34 Physical Education/

35 patient education/

36 (patient* adj5 educat*).tw.

37 ((lifestyle or life-style) adj5 (interven* or program* or treatment*)).tw.

38 self care/

39 (self adj5 (manag* or care or motivate*)).tw.

40 exp psychotherapy/

41 psychotherap*.tw.

42 (psycholog* adj5 intervent*).tw.

43 counseling/

44 (counselling or counseling).tw.

45 ((behavior* or behaviour*) adj5 (modify or modificat* or therap* or change)).tw.

46 (psycho-educat* or psychoeducat*).tw.

47 (motivat* adj5 (intervention or interv*)).tw.

48 health education/

49 (health adj5 educat*).tw.

50 (psychosocial or psycho-social).tw.

51 (cognitive adj2 behav*).tw.

52 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 or 45 or 46 or 47 or 48 or 49 or 50 or 51

53 random$.tw.

54 factorial$.tw.

55 crossover$.tw.

56 cross over$.tw.

57 cross-over$.tw.

58 placebo$.tw.

59 (doubl$ adj blind$).tw.

60 (singl$ adj blind$).tw.

61 assign$.tw.

62 allocat$.tw.

63 volunteer$.tw.

64 crossover procedure/

65 double blind procedure/

66 randomized controlled trial/

67 single blind procedure/

68 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67

69 (animal/ or nonhuman/) not human/

70 68 not 69

71 23 and 52 and 70

72 24 and 52 and 70

73 limit 71 to dd=20140702-20200901

74 72 not 71

75 73 or 74

76 limit 75 to embase

CINAHL

S75 S73 OR S74

S74 S22 AND S52 AND S70 Limiters - Published Date: 20140701-20200831

S73 S72 NOT S71

S72 S23 AND S52 AND S70

S71 S22 AND S52 AND S70

S70 S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S67 OR S68 OR S69

S69 TX cross-over*

S68 TX crossover*

S67 TX volunteer*

S66 (MH "Crossover Design")

S65 TX allocat*

S64 TX control*

S63 TX assign*

S62 TX placebo*

S61 (MH "Placebos")

S60 TX random*

S59 TX (doubl* N1 mask*)

S58 TX (singl* N1 mask*)

S57 TX (doubl* N1 blind*)

S56 TX (singl* N1 blind*)

S55 TX (clinic* N1 trial?)

S54 PT clinical trial

S53 (MH "Clinical Trials+")

S52 S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51

S51 (cognitive N2 behav*)

S50 (psychosocial or psycho-social)

S49 (health N5 educat*)

S48 (MH "Health Education")

S47 (motivat* N5 (intervention or interv*))

S46 (psycho-educat* or psychoeducat*)

S45 ((behavior* or behaviour*) N5 (modify or modificat* or therap* or change))

S44 (counselling or counseling)

S43 (MH "Counseling")

S42 (psycholog* N5 intervent*)

S41 psychotherap*

S40 (MH "Psychotherapy+")

S39 (self N5 (manag* or care or motivate*))

S38 (MH "Self Care")

S37 ((lifestyle or life-style) N5 (interven* or program* or treatment*))

S36 (patient* N5 educat*)

S35 (MH "Patient Education")

S34 (MH "Physical Education and Training")

S33 kinesiotherap*

S32 (MH "Rehabilitation+")

S31 ((exercise* or fitness) N3 (treatment or intervent* or program*))

S30 (train* N5 (strength* or aerobic* or exercise*))

S29 (MH "Exercise+")

S28 (physical* N5 (fit* or train* or therap* or activit*))

S27 rehabilitat*

S26 (MH "Physical Activity")

S25 (MH "Sports")

S24 (MH "Therapeutic Exercise+")

S23 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22

S22 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19

S21 ACS

S20 (NSTEMI or STEMI)

S19 "acute coronary syndrom*"

S18 atherectom*

S17 (MH "Atherectomy+")

S16 pci or ptca

S15 stent*

S14 (MH "Stents+")

S13 "endoluminal repair*"

S12 ((coronary or arterial) N4 dilat*)

S11 angioplast*

S10 (MH "Angioplasty+")

S9 (percutaneous coronary N2 (interven* or revascular*))

S8 (coronary N5 (disease* or bypass or thrombo* or angioplast*))

S7 angina

S6 (heart N5 infarct*)

S5 (myocard* N5 infarct*)

S4 (MH "Coronary Artery Bypass+")

S3 (isch?emi* N5 heart)

S2 (myocard* N5 (ischaemia or ischemia))

S1 (MH "Myocardial Ischemia+")

Web of Science

#16 #15 OR #14

#15 #11 AND #10 AND #8 Indexes=SCI-EXPANDED, CPCI-S Timespan=2014-2020

#14 #13 NOT #12

#13 #11 AND #10 AND #9

#12 #11 AND #10 AND #8

#11 TS=(random* or blind* or allocat* or assign* or trial* or placebo* or crossover* or cross-over*)

#10 TS=((rehab* or educat*))

#9 #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1

#8 #5 OR #4 OR #3 OR #2 OR #1

#7 TS=ACS

#6 TS=(NSTEMI or STEMI)

#5 TS=(PCI or percutaneous or angioplast* or "endoluminal repair*" or stent* or atherectom* or "acute coronary syndrom*")

#4 TS=((angina or cardiac* or PTCA or CABG))

#3 TS=(((heart) SAME (infarct* or isch?emia or failure or attack)))

#2 TS=(((coronary* or heart*) SAME (by?pass or disease*)))

#1 TS=(((myocard*) SAME (isch?emia or infarct* or revasculari?*)))

ClinicalTrials.gov

Condition or disease: Coronary Heart Disease

Intervention/treatment: Cardiac Rehabilitation

Study type: Interventional studies (Clinical Trials)

WHO ICTRP

Condition: Coronary Heart Disease

Intervention: Exercise OR Cardiac rehabilitation

WHAT'S NEW

Date	Event	Description
13 April 2021	New citation required but conclusions have not changed	22 newly included studies in this update, with 85 included in total. No substantive change in review conclusions.
11 January 2021	New search has been performed	New search has been performed (1/9/2020)

HISTORY

Protocol first published: Issue 3, 1999
Review first published: Issue 4, 2000

Date	Event	Description
3 September 2015	New citation required but conclusions have not changed	No substantive change in review conclusions
3 September 2015	New search has been performed	No substantive change in review conclusions
24 February 2015	Amended	New Author (Ann-Dorthe Zwisler) added
24 February 2015	Amended	New Author (Nicole Martin) added
24 February 2015	Amended	New Author (Lindsey Anderson) added

Date	Event	Description
24 February 2015	Amended	Author (David Thompson) details updated
7 June 2011	New citation required and conclusions have changed	The inclusion criteria have been revised for this update. Five out of the 35 formerly included studies (in the review) have therefore been excluded. The conclusions have changed based on the analysis of 47 included studies and have focused more on the impact of exercise-based cardiac rehabilitation on clinical events and HRQL outcomes.
7 June 2011	New search has been performed	The searches were updated and re-run in December 2009, identifying an additional 17 studies for inclusion. Fourty-seven trials in total have been included.
1 November 2000	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

This review update was undertaken by GD, JF and RST; namely, study selection, data extraction and risk of bias assessment.

A-DZ provided clinical advice during the process of the update.

GD, JF and RST wrote the first draft of the review update, and all co-authors contributed to reviewing and editing drafts of the review update.

All authors approved the final manuscript.

DECLARATIONS OF INTEREST

GD declares no conflicts of interest.

JF declares no conflicts of interest.

NO declares work as Professor at the University of Wisconsin-Milwaukee, USA. NO also declares being an author of a study that is eligible for inclusion in the work (funding source: European Society of Cardiology & European Association of Preventive Cardiology).

KR declares no conflicts of interest.

DRT declares being an author of a study that is eligible for inclusion in the work.

A-DZ declares being an author of a study that is eligible for inclusion in the work.

RST declares no conflicts of interest.

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  Support in form of salaries

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- NIHR, UK

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DIFFERENCES BETWEEN PROTOCOL AND REVIEW

In addition to updating the searches, the primary outcome of hospitalisation has been split to include both all-cause and cardiovascular hospitalisations. Due to the increased availability of HRQoL outcome data in this update, we were able to undertake a formal meta-analysis of this outcome (based on a number of measures, including SF-36 summary and domain scores, EQ-5D scores, and total/overall HRQoL scores). An additional meta-regression study level category has been added (low- and middle-income versus high-income countries), to allow us to explore if effect sizes varied by these settings.

In previous versions of this review, three additional risk of bias domains were included (groups balanced at baseline, intention-to-treat analysis undertaken and groups received comparable treatment (except exercise)). For this review update, we decided that these additional domains were no longer applicable and removed them.

INDEX TERMS

Medical Subject Headings (MeSH)

Coronary Disease [mortality] [*rehabilitation]; *Exercise Therapy; Health Status; Hospitalization; Myocardial Infarction [mortality] [rehabilitation]; Myocardial Revascularization [rehabilitation] [statistics & numerical data]; Outcome Assessment, Health Care; Quality of Life; Randomized Controlled Trials as Topic

MeSH check words

Female; Humans; Male