Cochrane Library

Cochrane Database of Systematic Reviews

Interventions to promote patient utilisation of cardiac rehabilitation (Review)

Santiago de Araújo Pio C, Chaves GSS, Davies P, Taylor RS, Grace SL

Santiago de Araújo Pio C, Chaves GSS, Davies P, Taylor RS, Grace SL.
Interventions to promote patient utilisation of cardiac rehabilitation.
Cochrane Database of Systematic Reviews 2019, Issue 2. Art. No.: CD007131.
DOI: 10.1002/14651858.CD007131.pub4.

www.cochranelibrary.com

WILEY

TABLE OF CONTENTS

[Intervention Review]

Interventions to promote patient utilisation of cardiac rehabilitation

Carolina Santiago de Araújo Pio[1], Gabriela SS Chaves[2], Philippa Davies[3], Rod S Taylor[4], Sherry L Grace[1,5]

[1]School of Kinesiology and Health Science, York University, Toronto, Canada. [2]Rehabilitation Science Program, Federal University of Minas Gerais, Belo Horizonte, Brazil. [3]Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK. [4]Institute of Health Research, University of Exeter Medical School, Exeter, UK. [5]Toronto Rehabilitation Institute, University Health Network, Toronto, Canada

Contact address: Rod S Taylor, Institute of Health Research, University of Exeter Medical School, South Cloisters, St Luke's Campus, Heavitree Road, Exeter, EX2 4SG, UK. rod.taylor@gla.ac.uk.

Editorial group: Cochrane Heart Group
Publication status and date: New search for studies and content updated (conclusions changed), published in Issue 2, 2019.

Citation: Santiago de Araújo Pio C, Chaves GSS, Davies P, Taylor RS, Grace SL. Interventions to promote patient utilisation of cardiac rehabilitation. *Cochrane Database of Systematic Reviews* 2019, Issue 2. Art. No.: CD007131. DOI: 10.1002/14651858.CD007131.pub4.

ABSTRACT

Background

International clinical practice guidelines routinely recommend that cardiac patients participate in rehabilitation programmes for comprehensive secondary prevention. However, data show that only a small proportion of these patients utilise rehabilitation.

Objectives

First, to assess interventions provided to increase patient enrolment in, adherence to, and completion of cardiac rehabilitation. Second, to assess intervention costs and associated harms, as well as interventions intended to promote equitable CR utilisation in vulnerable patient subpopulations.

Search methods

Review authors performed a search on 10 July 2018, to identify studies published since publication of the previous systematic review. We searched the Cochrane Central Register of Controlled Trials (CENTRAL); the National Health Service (NHS) Centre for Reviews and Dissemination (CRD) databases (Health Technology Assessment (HTA) and Database of Abstracts of Reviews of Effects (DARE)), in the Cochrane Library (Wiley); MEDLINE (Ovid); Embase (Elsevier); the Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCOhost); and Conference Proceedings Citation Index - Science (CPCI-S) on Web of Science (Clarivate Analytics). We checked the reference lists of relevant systematic reviews for additional studies and also searched two clinical trial registers. We applied no language restrictions.

Selection criteria

We included randomised controlled trials (RCTs) in adults with myocardial infarction, with angina, undergoing coronary artery bypass graft surgery or percutaneous coronary intervention, or with heart failure who were eligible for cardiac rehabilitation. Interventions had to aim to increase utilisation of comprehensive phase II cardiac rehabilitation. We included only studies that measured one or more of our primary outcomes. Secondary outcomes were harms and costs, and we focused on equity.

Data collection and analysis

Two review authors independently screened the titles and abstracts of all identified references for eligibility, and we obtained full papers of potentially relevant trials. Two review authors independently considered these trials for inclusion, assessed included studies for risk of bias, and extracted trial data independently. We resolved disagreements through consultation with a third review author. We performed random-effects meta-regression for each outcome and explored prespecified study characteristics.

Main results

Overall, we included 26 studies with 5299 participants (29 comparisons). Participants were primarily male (64.2%). Ten (38.5%) studies included patients with heart failure. We assessed most studies as having low or unclear risk of bias. Sixteen studies (3164 participants) reported interventions to improve enrolment in cardiac rehabilitation, 11 studies (2319 participants) reported interventions to improve adherence to cardiac rehabilitation, and seven studies (1567 participants) reported interventions to increase programme completion. Researchers tested a variety of interventions to increase utilisation of cardiac rehabilitation. In many studies, this consisted of contacts made by a healthcare provider during or shortly after an acute care hospitalisation.

Low-quality evidence shows an effect of interventions on increasing programme enrolment (19 comparisons; risk ratio (RR) 1.27, 95% confidence interval (CI) 1.13 to 1.42). Meta-regression revealed that the intervention deliverer (nurse or allied healthcare provider; P = 0.02) and the delivery format (face-to-face; P = 0.01) were influential in increasing enrolment. Low-quality evidence shows interventions to increase adherence were effective (nine comparisons; standardised mean difference (SMD) 0.38, 95% CI 0.20 to 0.55), particularly when they were delivered remotely, such as in home-based programs (SMD 0.56, 95% CI 0.37 to 0.76). Moderate-quality evidence shows interventions to increase programme completion were also effective (eight comparisons; RR 1.13, 95% CI 1.02 to 1.25), but those applied in multi-centre studies were less effective than those given in single-centre studies, leading to questions regarding generalisability. A moderate level of statistical heterogeneity across intervention studies reflects heterogeneity in intervention approaches. There was no evidence of small-study bias for enrolment (insufficient studies to test for this in the other outcomes).

With regard to secondary outcomes, no studies reported on harms associated with the interventions. Only two studies reported costs. In terms of equity, trialists tested interventions designed to improve utilisation among women and older patients. Evidence is insufficient for quantitative assessment of whether women-tailored programmes were associated with increased utilisation, and studies that assess motivating women are needed. For older participants, again while quantitative assessment could not be undertaken, peer navigation may improve enrolment.

Authors' conclusions

Interventions may increase cardiac rehabilitation enrolment, adherence and completion; however the quality of evidence was low to moderate due to heterogeneity of the interventions used, among other factors. Effects on enrolment were larger in studies targeting healthcare providers, training nurses, or allied healthcare providers to intervene face-to-face; effects on adherence were larger in studies that tested remote interventions. More research is needed, particularly to discover the best ways to increase programme completion.

PLAIN LANGUAGE SUMMARY

Promoting patient uptake and adherence in cardiac rehabilitation

Background

Cardiac rehabilitation programmes aid recovery from cardiac events such as heart attack, coronary stent placement, and bypass surgery, and reduce the likelihood of further illness. Cardiac rehabilitation programmes offer the following core components: exercise, education, risk factor management, and psychological counselling/support. Despite the benefits of cardiac rehabilitation, not everyone enrolls, and, of those who do, many people do not adhere to and complete the programme. This review evaluated trials of strategies to promote the utilisation of cardiac rehabilitation (enrolment, adherence, and completion).

Search

The search was current to July 2018.

Study characteristics

We searched a wide variety of scientific databases for randomised controlled trials (studies that allocate participants to one of two or more treatment groups in a random manner) in adults (over 18 years of age) who had a heart attack, had angina (chest pain), underwent coronary artery bypass grafting (a surgical procedure that diverts blood around narrowed or clogged sections of the major arteries to improve blood flow and oxygen supply to the heart muscle) or percutaneous coronary intervention (a procedure that opens up blocked coronary arteries), or with heart failure who were eligible for cardiac rehabilitation.

Reviewers found 26 trials (5299 participants) that were suitable for inclusion (16 trials of interventions to improve enrolment, eight trials of interventions to improve adherence, and seven trials of interventions to improve programme completion). These studies evaluated a variety of techniques to improve utilisation such as providing peer support, starting cardiac rehabilitation early after hospitalisation, providing patient education, offering cardiac rehabilitation outside a hospital setting, and offering shorter programmes or women-only programmes.

Key results

Strategies to increase enrolment were effective, particularly those that targeted healthcare providers, training nurses, or allied healthcare providers to intervene face-to-face. Interventions to increase adherence to programmes and to increase completion were effective, but it remains unclear which specific strategies were implemented.

We found no studies providing information about potential harms and two studies reporting costs of these strategies to increase use of cardiac rehabilitation. Some studies provided interventions to increase rehabilitation utilisation in women and older patients. Evidence was insufficient for quantitative assessment of whether women-tailored programmes were associated with increased utilisation, but motivating women appears key. For older participants, qualitative analysis suggested that peer support or postdischarge visits may improve enrolment, and group sessions promoting self-regulation skills may increase completion.

Quality of the evidence

Most of the included studies were of good quality (i.e. low risk of arriving at wrong conclusions because of favouritism by researchers). The quality of the evidence was low for enrolment and adherence and was moderate for completion. Publication bias for enrolment was not evident.

Summary of findings for the main comparison. Interventions to promote patient utilisation of cardiac rehabilitation

Interventions to promote patient utilisation of cardiac rehabilitation

Patient or population: adults (age 18 years or over) with myocardial infarction, stable angina, following coronary artery bypass graft surgery or percutaneous coronary intervention, or with heart failure who were eligible for cardiac rehabilitation (CR)
Setting: cardiac or primary care
Intervention: any interventions with the specific aim of increasing patient enrolment, adherence, or completion of comprehensive CR
Comparison: comparison arm - participants had to have an equivalent opportunity to attend a CR programme

Outcomes	No. of participants (studies) Follow-up (median weeks)	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Anticipated absolute effects* (95% CI)	
				Risk with no interventions to promote utilisation of CR	Risk difference with interventions to promote utilisation of CR
Enrolment	3096 (19 RCTs) - 11 weeks	⊕⊕⊖⊖ LOW[a,b]	RR 1.27 (1.13 to 1.42)	Study population	
				406 per 1000	110 more per 1000 (53 more to 171 more)
Adherence	1654 (9 RCTs) - 18 weeks	⊕⊕⊖⊖ LOW[a,b]	-	-	SMD 0.38 SD higher (0.20 higher to 0.55 higher)
Completion	1565 (8 RCTs) - 24 weeks	⊕⊕⊕⊖ MODERATE[b]	RR 1.13 (1.02 to 1.25)	Study population	
				649 per 1000	84 more per 1000 (13 more to 162 more)
Adverse events	This outcome was not reported by any of the included studies				

*__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; CR: cardiac rehabilitation; RCT: randomised controlled trial; RR: risk ratio; SMD: standardised mean difference.

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]Heterogeneity suggests evidence of inconsistency; therefore quality of evidence downgraded by one level.
[b]The included studies consisted of primarily white male participants; therefore quality of evidence downgraded by one level for indirectness.

BACKGROUND

Description of the condition

The burden of cardiovascular disease (CVD) is substantial, and it is the number one cause of death worldwide (WHO 2014). Advances in therapeutic procedures and pharmacological therapies have led to dramatic reductions in CVD mortality; as a result, greater numbers of men and women survive acute CVD events and are living with this condition chronically. In this context, there is increasing recognition of the need to build comprehensive, multi-dimensional prevention approaches to prevent recurrent CVD events and to optimise quality of life.

Description of the intervention

Cardiac rehabilitation (CR) refers to the "co-ordinated 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 2012). Cardiac rehabilitation includes specific core components that aim to optimise cardiovascular risk reduction, foster healthy behaviours (e.g. exercise, healthy eating, no smoking), increase patients' understanding of their disease, and improve psychosocial well-being (BACPR 2017; Kachur 2017). This review evaluates interventions that promote utilisation of a comprehensive phase II (i.e. post-acute care) CR programme. On average, patients attend a programme two times a week over five months (Santiago de Araujo Pio 2017).

How the intervention might work

Cardiac rehabilitation has been shown to improve quality of life, as well as to decrease subsequent morbidity and mortality (Anderson 2016). As a result, CR is an integral recommendation in many national guidelines for secondary prevention in cardiac patients (Amsterdam 2014; Fihn 2012; Hillis 2011; Levine 2011; Levine 2016; Mosca 2011; O'Gara 2013; Smith 2011; Yancy 2013). By promoting utilisation of CR, clinicians can help patients achieve the benefits of participation; the more patients participate, the better are their outcomes (Colbert 2014; Doll 2015; Hammill 2010; Santiago de Araujo Pio 2017; Whellan 2009).

Why it is important to do this review

Although beneficial effects of CR have been shown, utilisation remains suboptimal. Surveys across several countries have shown that only approximately 30% of eligible patients participate in such programmes (Beatty 2018; Kotseva 2018; NACR 2017; Turk-Adawi 2015). Such under-utilisation can be attributed in part to low referral rates among healthcare providers (Clark 2013). However, even among individuals referred to CR, few enrol in the programme, and many of those who do, drop out (Oosenbrug 2016; Peters 2017; Samayoa 2014). Factors impacting utilisation of CR include logistical factors (e.g. distance, financial constraints), intrapersonal factors (e.g. gender, age, depression), interpersonal factors (e.g. social support, work obligations), programme factors (e.g. time of delivery), and healthcare system factors (e.g. lack of referral, cost) (Clark 2012; Resurrección 2018).

This review was originally published in 2005 (Beswick 2005); it was updated via Cochrane methods in 2010 (Davies 2010a), and again in 2014 (Karmali 2014). This Review has identified some evidence to show that interventions to increase enrolment (termed "uptake" in previous versions) in CR can be effective but has found insufficient evidence to provide recommendations on interventions to increase adherence. Review authors did not specifically consider programme completion. Since the time the review was published, several new trials have been completed, and these results could potentially be pooled quantitatively to more rigorously test the effects of these utilisation interventions. In this review, we aimed to update the 2014 review by incorporating and analysing the most recent additions to the literature.

OBJECTIVES

First, to assess interventions provided to increase patient enrolment in, adherence to, and completion of cardiac rehabilitation. Second, to assess intervention costs and associated harms, as well as interventions intended to promote equitable CR utilisation in vulnerable patient subpopulations.

METHODS

Criteria for considering studies for this review

Types of studies

We included randomised or quasi-randomised controlled trials (RCTs) at the individual or cluster level, of parallel-group or cross-over design.

Types of participants

We included adults (age 18 years or over) with myocardial infarction (MI), with angina, following coronary artery bypass graft (CABG) surgery or percutaneous coronary intervention (PCI), or with heart failure (HF) who were eligible for CR (inpatient or outpatient setting). For studies for which only part of the sample would be considered eligible based on the criteria for this review, we contacted the corresponding author to request findings in the eligible subsample. For studies of interventions to increase adherence or completion, participants were those who had already enrolled to take part in a CR programme at the start of the study.

Types of interventions

We included any intervention with the specific aim of increasing patient enrolment in, adherence to, or completion of CR. For the purposes of this review, we defined CR programmes as those that offer (1) initial patient assessment, (2) prescribed, structured exercise, and (3) at least one other strategy to control CV risk factors (i.e. comprehensive CR). Interventions could be targeted to individuals, groups, partners, caregivers or other family members, or healthcare professionals. We excluded studies evaluating the effects of interventions to improve exercise behaviour or utilisation of pharmacological treatments alone (i.e. not in conjunction with any other CR components). Comparison arm participants had to be given an equivalent opportunity to attend a CR programme. Studies of adherence or completion had to offer a comparable CR programme in the comparison arm.

Types of outcome measures

Primary outcomes

Primary utilisation outcome measures for this review included:

- enrolment (formerly termed "uptake") in a CR programme, which we defined as participant attendance at a first visit (dichotomous, yes/no);
- adherence to CR, defined as percentage of total prescribed sessions completed; and
- completion, whereby participants attended at least some of the CR intervention components and underwent formal re-assessment by the CR team at the conclusion of the programme (dichotomous, yes/no).

When researchers assessed a utilisation indicator but did not operationalise it in accordance with the definitions herein, we considered the article eligible for quantitative pooling. We did not consider measures such as exercise capacity (strength, peak oxygen uptake), as they do not give an indication of the extent to which participants adhered to the overall programme (just exercise).

Length of follow-up is a consideration only for studies of enrolment, as adherence and completion can be assessed only at programme end (regardless of programme duration, but this was considered in subgroup analysis). For studies in which researchers ascertained enrolment at more than one follow-up point, we included the longest follow-up at which all participants were included.

Secondary outcomes

Secondary outcomes were:

- harms or adverse events related to the intervention;
- costs (i.e. costs of implementing the intervention, or costs of avoiding health care as a result of the intervention); and
- equity (i.e. intervention provided to increase utilisation in under-represented groups such as women, ethnocultural minorities, and patients of low socioeconomic status who are older, rural, or complex (e.g. multiple indications, comorbidities)). Equity could be operationalised as the proportion of participants in a certain under-represented group utilising CR, or studies could include only participants from under-represented groups and could compare the impact of an intervention on utilisation versus usual CR care.

We included only studies that measured at least one primary outcome.

Search methods for identification of studies

We used a generic search strategy, as this review forms part of the broader set of Cochrane reviews regarding CR (Anderson 2016; Davies 2010b; Heran 2011; Taylor 2010b; Whalley 2011), and we applied detailed search strategies for each electronic database searched.

Electronic searches

We adapted and updated search terms from the 2014 Cochrane review (Karmali 2014), and we searched the following databases on 10 July 2018.

- Cochrane Central Register of Controlled Trials (CENTRAL), in the Cochrane Library (Wiley), July 2018.
- Database of Abstracts of Reviews of Effects (DARE; Issue 2 of 4), in the Cochrane Library (Wiley), April 2015.
- Health Technology Assessment Database (HTAD; Issue 4 of 4), in the Cochrane Library (Wiley), October 2016.
- MEDLINE Ovid, 1946 to 10 July 2018; MEDLINE In-Process & Other Non-Indexed Citations Ovid, 10 July 2018; MEDLINE(R) Epub Ahead of Print Ovid, 10 July 2018.
- Embase, 1974 to 9 July 2018; Embase Classic, 1947 to 1973.
- Cumulative Index to Nursing and Allied Health Literature (CINAHL), with full text (EBSCOhost), 1981 to present.
- Conference Proceedings Citation Index - Science (CPCI-S) (Web of Science, Clarivate Analytics), 1900 to 9 July 2018.

We applied search filters to several databases in an attempt to limit retrieval to RCTs. For MEDLINE, we applied the Cochrane highly sensitive search filter, sensitivity-maximising version (Lefebvre 2011). For Embase, we translated from Ovid to embase.com syntax the multi-term Embase filter with the best balance of sensitivity and specificity (Wong 2006), and we limited the search to records indexed in Embase. For CINAHL, we used the McMaster highly sensitive filter for retrieving RCTs (Wong 2006b). For the Conference Proceedings Citation Index - Science, we used a combination of terms to identify trials described in Section 6.3.2.2, of the *Cochrane Handbook for Systematic Reviews of Interventions* (Lefebvre 2011).

For this update, we limited retrieval by entry date, from 2013 to the search date, for MEDLINE, Embase, and CINAHL. We limited retrieval by publication date, from 2013 to the search date, for Web of Science and the Cochrane Library. We did not employ any RCT filters or date limits to Ovid MEDLINE In-Process or Epub Ahead of Print databases. We imposed no language or other limitations. We considered variations in terms used and in spellings of terms in different countries, so studies were not missed by the search strategy. See Appendix 1 for the search strategy employed in this update.

Searching other resources

We handsearched the reference lists from other identified publications for potentially relevant articles (e.g. systematic review and meta-analysis, such as Matata 2017). We asked the main authors of studies and experts in this field for any missed, unreported, or ongoing trials. If study articles fit review eligibility criteria, we considered them for inclusion. We searched clinical trial registers (Clinicaltrials.gov - www.clinicaltrials.gov; and the World Health Organization (WHO) International Clinical Trials Registry platform - http://www.who.int/ictrp/en/) on 10 July 2018. We used the search terms "enrolment", "adherence", "completion", "compliance", "uptake", "cardiac rehabilitation", "physiotherapy", "coronary artery disease", and "heart disease", among others, to identify recent and ongoing trials. Based on changes to inclusion and exclusion criteria, we re-considered studies that had been included, excluded, and ongoing in the previous review for inclusion in this present review.

Data collection and analysis

Selection of studies

At least two review authors (CP, GC) independently screened references identified through the search strategy. To be selected,

abstracts had to identify the study design clearly, an appropriate population, and a relevant intervention. We excluded clearly irrelevant references. We obtained the full-text reports of potentially eligible trials, and two review authors (CP, GC) independently assessed them for eligibility, based on the criteria defined above. We resolved disagreements by discussion or, when we could not reach agreement, by consultation with an independent third review author (SG). We undertook this in Covidence (COVIDENCE).

Data extraction and management

For this update, we developed an updated data extraction form based on the one developed for the previous review, the Cochrane Heart Group template for RCTs, and amendments to the methods for this updated review. We built this into Covidence. Two review authors (CP, GC) independently extracted relevant data characterising study design, participants, intervention features, risk of bias, and results. We resolved disagreements by discussion or, when we could not reach agreement, by consultation with a third review author (SG).

One review author transferred extracted data into Review Manager (CP), and a second review author (GC) spot-checked data for accuracy. One review author transferred extracted data on outcomes and subgroup categorisations to SPSS version 24, for importing to STATA version 15.1, for meta-regression analysis. A second review author checked every variable (SG).

Assessment of risk of bias in included studies

In the previous version of this review, we assessed the risk of bias in eligible trials using the risk of bias tool recommended by Cochrane (Higgins 2011); a single review author (FT) assessed risk, and a second review author verified this (PD). A review author for this update independently rated this information (CP) and discussed discrepancies with a fourth review author (SG).

Two review authors (CP, GC) independently assessed risk of bias, again using the Cochrane risk of bias tool (Higgins 2011); for studies newly included in this update, review authors discussed discrepancies between them. A third review author (PD) checked risk of bias ratings.

Because of the nature of the interventions studied, it would not be possible to blind personnel or participants to treatment assignment. Therefore for all included trials, risk of bias should be considered high in that domain.

In our risk of bias table, we reported on blinding of outcome assessors only.

Measures of treatment effect

We expressed dichotomous outcomes for each comparison as risk ratios (RRs) with 95% confidence intervals (CIs). We expressed the continuous outcome of adherence as standardised mean difference, as we noted differences in how the outcome was reported (i.e. percentage or number of sessions).

Unit of analysis issues

We identified one cluster randomised trial (Jolly 1999). We contacted the trial investigators, who could not provide the information needed to adjust for clustering. Researchers did use generalised estimating equations to account for clustering, and this made little difference in the results. This study has contributed to our numerical analysis as if it were individually randomised. Thus, as we included it in the meta-analysis, we also carried out a sensitivity analysis to determine the effect when we removed this study from the analysis.

Dealing with missing data

We contacted the authors of included studies when an outcome was reported but was not quantified in a manner consistent with the operationalisations herein, such that the study might be precluded from inclusion in meta-analysis or meta-regression.

Assessment of heterogeneity

We first explored heterogeneity amongst included studies qualitatively by comparing characteristics of included studies. We also assessed heterogeneity by visually inspecting forest plots to observe the direction and magnitude of effects and the degree of overlap between CIs for all outcomes, while considering the Chi^2 test (with a P value of 0.10 indicating statistically significant heterogeneity). We also considered the I^2 statistic when we found a considerable number of studies (i.e. ≥ 10) with values around 30% to 60% considered a moderate level of heterogeneity, and above this indicating substantial heterogeneity (Higgins 2011c), warranting further investigation through random-effects meta-regression.

Assessment of reporting biases

We assessed for the presence of publication bias by looking for funnel plot asymmetry and by testing for asymmetry using Egger's test in STATA version 15.1 (Egger 1997; STATA 2017).

Data synthesis

To perform meta-analysis, we used RevMan 5.3 to combine results when possible (RevMan 2014). We estimated differences between the intervention and usual care by using random-effects models and the DerSimonian-Laird method, as we assumed that estimated effects were not identical between studies.

We conducted univariate meta-regression in STATA version 15.1 to explore heterogeneity and to examine potential intervention effect modifiers, as prespecified below (STATA 2017). We performed meta-regression only when we included at least 10 trials for a specific outcome (Borenstein 2009). Given the small number of studies, it was not considered possible to examine more than one subgroup simultaneously. Given the number of tests performed and hence the potential for error, we applied a more conservative P value < 0.01 (with values < 0.05 but > 0.01 considered to signify that future research is needed to explore whether a true effect exists).

Subgroup analysis and investigation of heterogeneity

We conducted the following subgroup analyses when possible (i.e. sufficient number of trials in each category), to explore substantial heterogeneity.

- Intervention intensity (number of contacts; e.g. mail, visit, call).
- Intervention deliverer (nurse or allied healthcare provider vs other or none).
- Delivery format (any face-to-face vs no face-to-face).
- Theory-based intervention (yes vs no).
- Peer navigation (yes vs no).

- Intervention target (patient vs other).
- Outcome ascertainment (self-report vs chart report).
- Multi-centre study (multi-site vs single-centre).
- Cardiac indication (HF included vs HF not included).
- Region (North America vs other).
- Setting of CR (supervised only vs at least some unsupervised provided).
- CR programme duration (three months or longer vs less than three months).
- Intervention timing (delivered before CR vs during CR).

Please note that we considered the last two to be relevant only to the outcomes of adherence and completion.

Sensitivity analysis

We performed a sensitivity analysis to explore the influence of risk of bias, restricting the analysis to studies considered to be at low risk of bias in four of the six Cochrane risk of bias domains.(as per Anderson 2016). We also performed a sensitivity analysis to see the effect when we removed the cluster RCT from the analysis of outcome enrolment.

'Summary of findings'

We created Summary of findings for the main comparison using the following outcomes: enrolment, adherence, and completion. We used the five GRADE considerations (study limitations, consistency of effect, imprecision, indirectness, and publication bias) to assess the quality of the body of evidence as it related to studies that contributed data to analyses for prespecified outcomes. We applied methods and recommendations described in Section 8.5 and Chapter 12 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011), using GRADEpro software (https://gradepro.org/).

One review author (CP) made judgements about evidence quality while working independently. A second review author (PD) checked these assessments. We justified, documented, and incorporated these judgements into reporting of results for each outcome.

We extracted study data, formatted our comparisons in data tables, and prepared Summary of findings for the main comparison before writing the results and conclusions of this review.

RESULTS

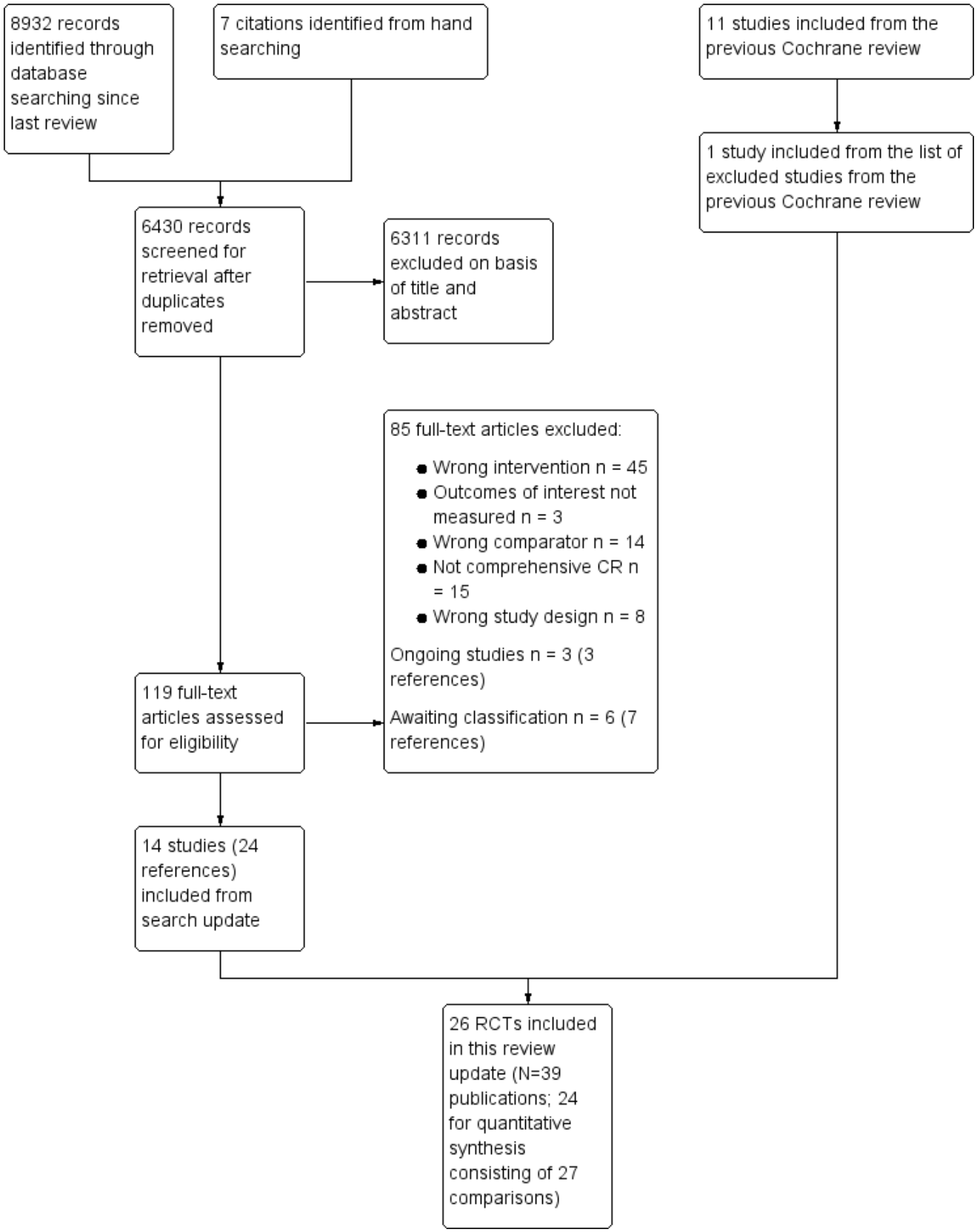
Description of studies

Results of the search

The previous version of this Cochrane review included 18 RCTs (Karmali 2014), of which we considered 11 eligible for the current review upon application of the updated inclusion/exclusion criteria (Ashe 1993; Beckie 2010; Cossette 2012; Dolansky 2011; Jolly 1999; McPaul 2007; Oldridge 1983; Pack 2013; Parry 2009; Price 2012; Wyer 2001). We have presented reasons for exclusion of the other seven trials in the Characteristics of excluded studies table. Reasons were primarily that CR programmes were not comprehensive (i.e. provided exercise only) and that the study was examining degree of exercise rather than utilisation of the full CR programme as the outcome. We checked previously excluded studies for eligibility and included one in the current review (Carroll 2007).

The updated electronic search performed in July 2018 yielded 6430 titles after removal of duplicates, and we included seven additional titles derived from handsearching. After reviewing titles and abstracts, we retrieved 119 full-text articles for possible inclusion and excluded 85 studies. Fourteen trials met the inclusion criteria (Ali Faisal 2016; Benz Scott 2013; Bertelsen 2017; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Lynggaard 2017; McGrady 2014; Mosleh 2014; Pfaeffli Dale 2015; Suskin 2007; Varnfield 2014). We have illustrated the study selection process in the flow diagram in Figure 1. Thus, we have included 26 trials (5299 participants) in this update and have listed details of these studies in the Characteristics of included studies table.

Figure 1. Flow diagram of the study selection process for this update.



Included studies

The previous version of this review included eight RCTs that included 1310 participants and evaluated interventions to increase enrolment (formerly termed "uptake") of CR (Cossette 2012; Dolansky 2011; Jolly 1999; McPaul 2007; Pack 2013, Parry 2009; Price 2012; Wyer 2001); all but one met inclusion criteria for this updated review, as the intervention was delivered post CR (Hillebrand 1995). The updated search revealed eight new trials with 1854 participants (Ali Faisal 2016; Benz Scott 2013; Carroll 2007; Grace 2016; Mosleh 2014; Pfaeffli Dale 2015; Suskin 2007; Varnfield 2014). Thus, we considered 16 trials with 3164 participants that evaluated interventions to increase enrolment in CR.

In the previous version of this review, we included eight RCTs with 1374 participants that evaluated interventions to increase adherence to CR (Arrigo 2008; Beckie 2010; Daltroy 1985; Duncan 2003; Izawa 2005; Moore 2006; Pack 2013; Sniehotta 2006). Only three trials with 443 participants met the inclusion criteria for this updated review (Ashe 1993; Beckie 2010; Pack 2013). Reasons for exclusion of Daltroy 1985, Duncan 2003, and Sniehotta 2006 were that studies did not offer comprehensive CR (i.e. provided exercise only), and Izawa 2005, Arrigo 2008, and Moore 2006 intervened after CR completion. The updated search yielded eight new trials with 1880 participants (Bertelsen 2017; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Lynggaard 2017; McGrady 2014). Thus, we considered 11 trials with 2323 participants that evaluated interventions to increase adherence to CR.

Finally, we were the first to examine the outcome of completion in this review. We included three RCTs with 311 participants that were identified in previous reviews and measured this outcome (Ashe 1993; Oldridge 1983; Pack 2013). The updated search revealed four new trials with 1256 participants (Focht 2004; Grace 2016; Lynggaard 2017; Varnfield 2014). Overall, we included seven RCTs with 1567 participants for this outcome.

Sixteen trials were conducted in North America (Ali Faisal 2016; Ashe 1993; Beckie 2010; Benz Scott 2013; Carroll 2007; Cossette 2012; Dolansky 2011; Farias-Godoy 2013; Focht 2004; Grace 2016; McGrady 2014; Oldridge 1983; Pack 2013; Parry 2009; Price 2012; Suskin 2007), three in Europe (Jolly 1999; McPaul 2007; Wyer 2001), and seven on other continents (Bertelsen 2017; Hwang 2017; Kraal 2014; Lynggaard 2017; Mosleh 2014; Pfaeffli Dale 2015; Varnfield 2014).

Cardiac rehabilitation programmes on average were 12.8 ± 4.6 weeks in duration (n = 10; 38.4% ≥ 3 months). Three (1.1%) trials offered a women-only (1) or gender-tailored (2) programme (380 participants; Beckie 2010; Grace 2016; Price 2012). Finally, in eight (30.8%) trials, researchers delivered some or all of the CR programme in an unsupervised setting.

Study design

Twenty-five (96.1%) trials were parallel-group RCTs (Ali Faisal 2016; Ashe 1993; Beckie 2010; Benz Scott 2013; Bertelsen 2017; Carroll 2007; Cossette 2012; Dolansky 2011; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Lynggaard 2017; McGrady 2014; McPaul 2007; Mosleh 2014; Oldridge 1983; Pack 2013; Parry 2009; Pfaeffli Dale 2015; Price 2012; Suskin 2007; Varnfield 2014; Wyer 2001). Most trials had two arms, but one had three arms (Grace 2016), and one used a two-by-two factorial design with four arms (Mosleh 2014). One trial was cluster randomised by general practice (Jolly 1999; see "unit of analysis" subsection above). Jolly 1999 evaluated a multi-faceted intervention involving liaison nurses who co-ordinated the transfer of care between hospital and general practice, together with patient-held record cards to prompt and guide follow-up.

Fourteen (53.8%) were multi-centre trials (Ali Faisal 2016; Ashe 1993; Bertelsen 2017; Carroll 2007; Dolansky 2011; Focht 2004; Grace 2016; Hwang 2017; Jolly 1999; Lynggaard 2017; McPaul 2007; Mosleh 2014; Pfaeffli Dale 2015; Benz Scott 2013). Most trials had small sample sizes, but three studies included more than 500 participants (Jolly 1999; Lynggaard 2017; Suskin 2007).

Twenty (76.9%) trials reported funding sources, none or which were industry related (Ali Faisal 2016; Beckie 2010; Benz Scott 2013; Bertelsen 2017; Carroll 2007; Cossette 2012; Dolansky 2011; Focht 2004; Grace 2016; Hwang 2017; Jolly 1999; Kraal 2014; Lynggaard 2017; McPaul 2007; Oldridge 1983; Pack 2013; Parry 2009; Pfaeffli Dale 2015; Price 2012; Varnfield 2014).

With regard to funding sources, one (3.8%) trial was not funded (Mosleh 2014), and five (19.2%) trials did not report funding sources (Ashe 1993; Farias-Godoy 2013; McGrady 2014; Suskin 2007; Wyer 2001). Eleven (42.3%) trials received government funding (Beckie 2010; Bertelsen 2017; Carroll 2007; Cossette 2012; Dolansky 2011; Focht 2004; Jolly 1999; Lynggaard 2017; McPaul 2007; Oldridge 1983; Varnfield 2014), eight (30.7%) trials received foundation funding (Cossette 2012; Grace 2016; Hwang 2017; Kraal 2014; Lynggaard 2017; Parry 2009; Pfaeffli Dale 2015; Price 2012), three (11.5%) trials received hospital funding (Pack 2013; Parry 2009; Price 2012), and two (7.6%) trials received university funding (Ali Faisal 2016; Benz Scott 2013). Some trials reported multiple sources of funding.

Participants

Most (i.e. ≥ 50%) participants in 21 (80.7%) trials were male, with rates ranging between 66.0% and 87.2% (Ali Faisal 2016; Ashe 1993; Benz Scott 2013; Bertelsen 2017; Cossette 2012; Farias-Godoy 2013; Focht 2004; Hwang 2017; Jolly 1999; Kraal 2014; Lynggaard 2017; McGrady 2014; McPaul 2007; Mosleh 2014; Oldridge 1983; Pack 2013; Parry 2009; Pfaeffli Dale 2015; Suskin 2007; Varnfield 2014; Wyer 2001). Three trials exclusively included women (Beckie 2010; Grace 2016; Price 2012).

Mean age of participants was 63.4 ± 10.4 years. Three trials exclusively focussed on older people (i.e. ≥ 50 years) with a mean age of 76.8 ± 6.6 years (Carroll 2007; Dolansky 2011; Focht 2004).

Most trials included more than one indication for CR (n = 22; 84.6%), and 10 (38.4%) studies included patients with HF in their sample (Ali Faisal 2016; Benz Scott 2013; Carroll 2007; Focht 2004; Hwang 2017; Lynggaard 2017; McGrady 2014; Pack 2013; Price 2012; Varnfield 2014). Please note that 27.2% of participants in one trial received primary prevention (Farias-Godoy 2013). We contacted study authors, but they did not provide data for eligible patients only. We nevertheless included the full sample in this review.

Interventions

Included trials tested a variety of strategies to increase utilisation of CR.

However, the intervention in many trials consisted of contacts by a healthcare provider during or shortly after an acute care hospitalisation.

For example, a few trials utilised a structured telephone call or visit after hospital discharge (Cossette 2012; Jolly 1999; McPaul 2007; Price 2012). Cossette 2012 studied the effect of a nursing intervention focussed on illness perceptions that provided a combination of telephone and face-to-face meetings during the 10 days after hospital discharge. Price 2012 studied the effects of a nurse-delivered telephone coaching programme. McPaul 2007 studied the effects of home visits versus telephone follow-up by an occupational therapist on CR attendance. In eight (30.7%) trials, a nurse or an allied healthcare provider delivered the intervention (Beckie 2010; Carroll 2007; Cossette 2012; Dolansky 2011; Jolly 1999; Lynggaard 2017; McPaul 2007; Price 2012). The intervention to increase utilisation involved some face-to-face interaction in 14 (53.8%) studies.

In 15 (57.7%) trials, the interventions were theory-based (Ashe 1993; Beckie 2010; Carroll 2007; Cossette 2012; Dolansky 2011; Farias-Godoy 2013; Focht 2004; Kraal 2014; Lynggaard 2017; McGrady 2014; Mosleh 2014; Oldridge 1983; Pfaeffli Dale 2015; Price 2012; Wyer 2001). For example, Wyer 2001 evaluated the effects of motivational letters based on the theory of planned behaviour (Ajzen 1986), and others performed evaluations based on social cognitive theory (Focht 2004; Pfaeffli Dale 2015; Price 2012). Four trials used peer navigation to promote utilisation (Ali Faisal 2016; Benz Scott 2013; Carroll 2007; Parry 2009).

Eight (30.8%) RCTs offered CR in an unsupervised or hybrid setting as the strategy to increase utilisation (Ali Faisal 2016; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Pfaeffli Dale 2015; Varnfield 2014); in four studies, these home-based programmes exploited information and communications technology (Hwang 2017; Kraal 2014; Pfaeffli Dale 2015; Varnfield 2014).

Overall, interventions to increase utilisation consisted of a mean of 14.5 ± 32.3 contacts. Almost all trials (n = 23; 88.5%) targeted the intervention to the cardiac patient; other targets included nurses (Jolly 1999), family (Dolansky 2011), and groups of participants (Focht 2004). Thirteen (50.0%) trials delivered the intervention before CR (Ali Faisal 2016; Carroll 2007; Cossette 2012; Dolansky 2011; Jolly 1999; McPaul 2007; Mosleh 2014; Pack 2013; Parry 2009; Price 2012; Benz Scott 2013; Suskin 2007; Wyer 2001).

Outcomes

In all 16 RCTs included for enrolment, the outcome could be quantified in a manner comparable with the definition used herein. Of the 11 RCTs included for adherence, we could quantify and report the outcomes for eight (72.7%) studies (contacted study authors when this was not the case) in a manner comparable with the definition used herein (exceptions were Bertelsen 2017, McGrady 2014, and Pack 2013). In all seven RCTs included for completion, again we could quantify the outcome in a manner comparable with the definition used herein. Ultimately we identified 24 (96.0%) trials that were appropriate for quantitative pooling.

We ascertained outcomes from charts rather than from self-reports for most (n = 13; 50.0%) trials (Ali Faisal 2016; Ashe 1993; Beckie 2010; Benz Scott 2013; Bertelsen 2017; Cossette 2012; Dolansky 2011; Farias-Godoy 2013; Grace 2016; Lynggaard 2017; McPaul 2007; Pack 2013; Wyer 2001), and from self-reports for four (15.4%) studies (Carroll 2007; Jolly 1999; Kraal 2014; Price 2012); however, the source of outcome data was unclear for nine (34.6%) trials (Focht 2004; Hwang 2017; McGrady 2014; Mosleh 2014; Oldridge 1983; Parry 2009; Pfaeffli Dale 2015; Suskin 2007; Varnfield 2014).

No studies measured arms systematically as a prespecified outcome for the intervention. Trials may have measured adverse events (or lack thereof) associated with CR participation. No trials included in the previous version of this review provided information on costs of the intervention nor on other resource implications (Karmali 2014). Two RCTs included herein incorporated an economic analysis (Bertelsen 2017; Kraal 2014). The former trial examined the role of home-based CR in increasing adherence, and the latter assessed the cost utility of offering CR shared between primary care and community rather than in hospital.

Six (23.1%) trials applied strategies to increase utilisation of CR in previously under-represented patient subsets of women - Beckie 2010, Grace 2016, Price 2012 - and older people - Carroll 2007, Dolansky 2011, Focht 2004 - as per our equity focus. For example, Beckie 2010 compared the effects of a gender-tailored CR programme with motivational interviewing versus traditional CR on attendance in exercise and educational sessions, and Grace 2016 compared utilisation rates among women referred to supervised mixed-sex (traditional), women-only (not necessarily gender-tailored), or home-based CR. Dolansky 2011 studied the effects of a family-directed intervention delivered post acute care to older patients discharged to an inpatient longer-term care facility or receiving home care. Allied healthcare providers in these settings provided cardiac self-management instruction and exercise monitoring.

Excluded studies

As outlined above, we considered excluded studies from the previous reviews for inclusion in this update, given the changes in PICOs, but none met the inclusion criteria.

For the current update, we excluded 85 studies after full-text review (Figure 1). We have provided a list of excluded studies, together with reasons for exclusion, in the Characteristics of excluded studies table. For most (n = 47; 55.3%) studies, the reason for exclusion was that the intervention was not focussed on increasing utilisation of CR; in 14 (16.5%) studies, CR programmes were not comprehensive (i.e. provided exercise only); in 14 (16.5%) studies, adherence or completion outcomes did not have a comparable CR programme in the control group; seven (8.2%) studies were not randomised; and three (3.5%) studies did not measure the outcomes of interest.

Ongoing studies

The previous review identified two RCT protocols (Karmali 2014). We considered both studies during full-text screening for this review. We included one RCT - Pfaeffli Dale 2015 - and excluded the other - Sangster 2015 - as the control group did not receive comprehensive CR.

We identified three new ongoing trials (Collela 2016; Gaalema 2014; Suhar 2016). One RCT is examining the effects of an "app" on CR enrolment during six to eight weeks post hospital discharge for bypass surgery (Collela 2016). Another study is using financial

incentives to promote increases in CR utilisation among patients of low socioeconomic status (Gaalema 2014). The third study is testing the effects of healing touch therapy while patients wait to enter a CR programme (Suhar 2016). We have provided details on all these studies in the Characteristics of ongoing studies table.

Studies awaiting classification

We identified no studies awaiting classification in the previous review. The updated search yielded six completed trials that met the inclusion criteria, for which more information is needed before we can include them in the review (Ivers 2017; LaValley 2017; Rouleau 2017; Sunamura 2018; Suskin 2006; Taylor 2010a); we have shown these in the Characteristics of studies awaiting classification table.

Risk of bias in included studies

We have presented in Figure 2 and Figure 3 the risk of bias for the 26 included trials based on available information. For 18 (69.2%) studies, risk was low in four or more of the six domains.

Figure 2. Methodological quality graph: review authors' judgments about each risk of bias element presented as percentages across all included studies.

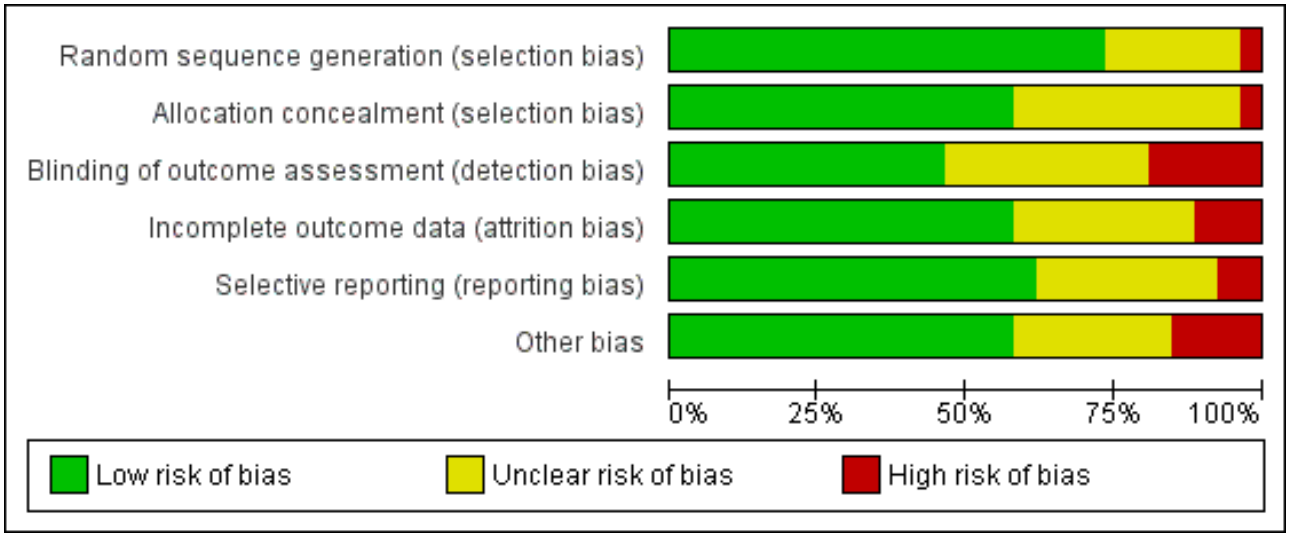


Figure 3. Methodological quality summary: review authors' judgments about each risk of bias item for each included study.

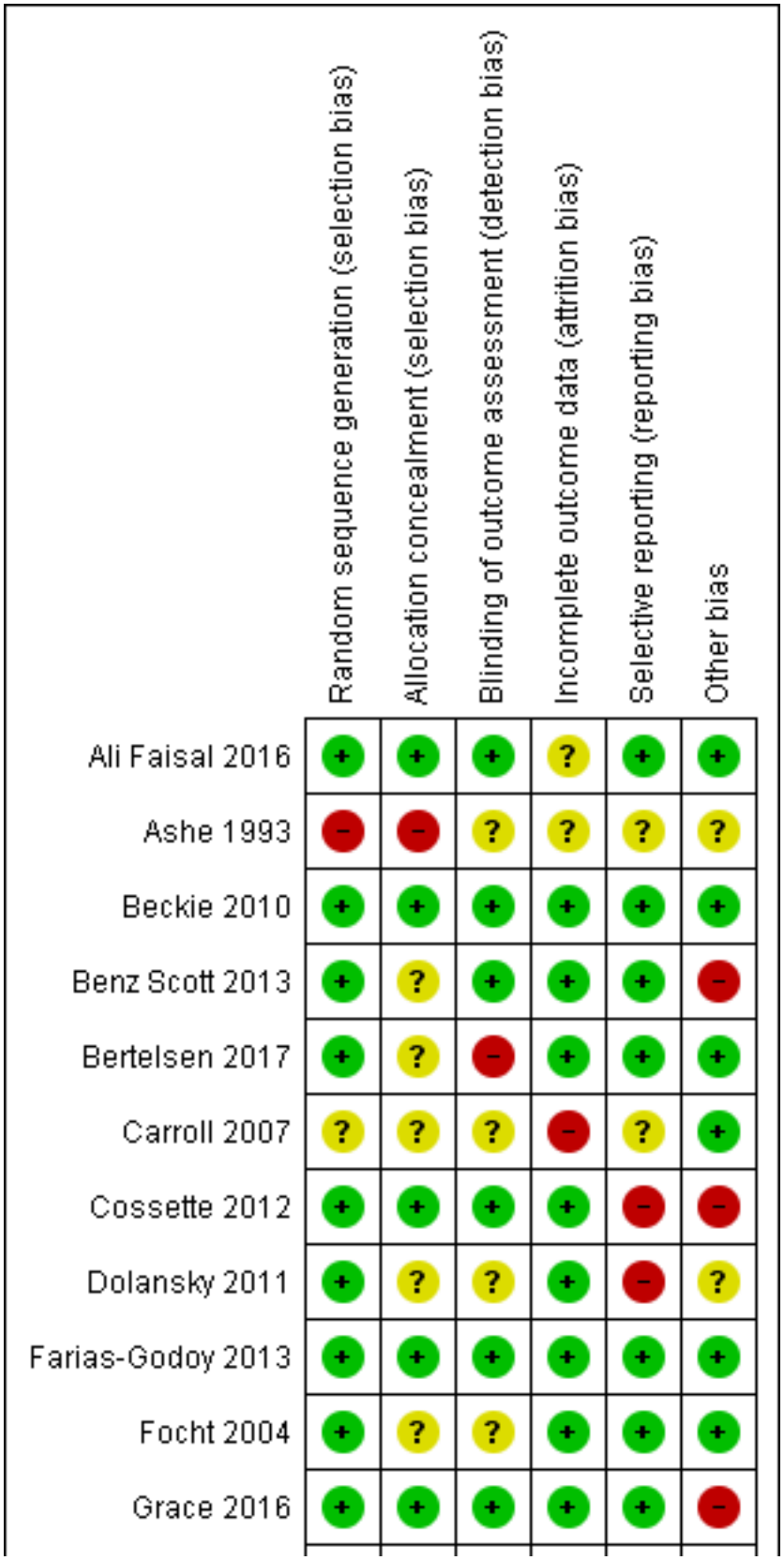
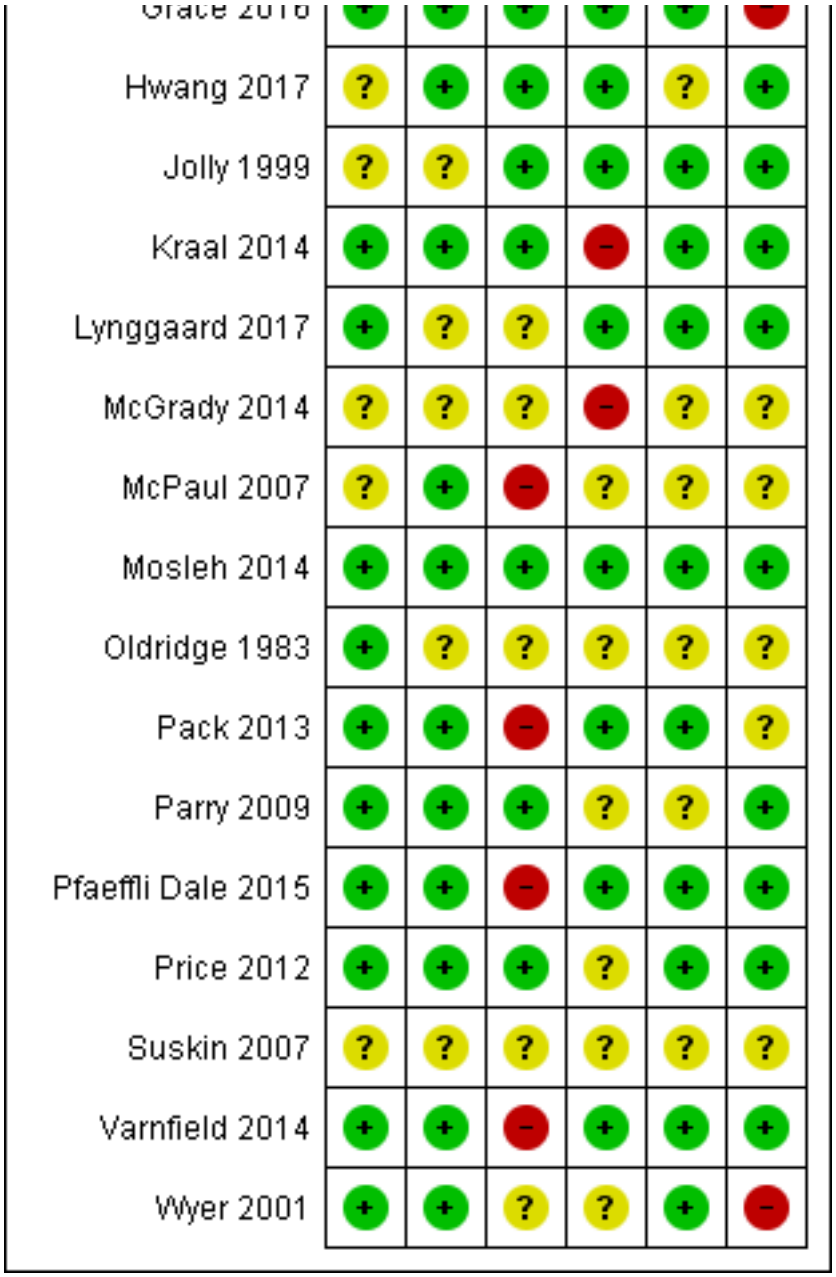


Figure 3. (Continued)



Allocation

Study authors described all studies as randomised, but five (19.2%) did not report the method of randomisation (Carroll 2007; Jolly 1999; McGrady 2014; McPaul 2007; Suskin 2007). Twenty (76.9%) studies reported details supporting appropriate generation of random sequence (Ali Faisal 2016; Beckie 2010; Benz Scott 2013; Bertelsen 2017; Cossette 2012; Dolansky 2011; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Lynggaard 2017; Mosleh 2014; Oldridge 1983; Pack 2013; Parry 2009; Pfaeffli Dale 2015; Price 2012; Varnfield 2014; Wyer 2001), and this method was not satisfactory in one study (Ashe 1993).

Two (7.6%) studies did not conceal allocation before entry to the study (Ashe 1993; Farias-Godoy 2013), and 11 (42.3%) studies provided unclear details (Benz Scott 2013; Bertelsen 2017; Carroll 2007; Dolansky 2011; Focht 2004; Jolly 1999; Lynggaard 2017; McGrady 2014; Oldridge 1983; Parry 2009; Suskin 2007). Thirteen (50.0%) studies adequately described methods used to conceal allocation (Ali Faisal 2016; Beckie 2010; Cossette 2012; Grace 2016; Hwang 2017; Kraal 2014; McPaul 2007; Mosleh 2014; Pack 2013; Pfaeffli Dale 2015; Price 2012; Varnfield 2014; Wyer 2001).

Blinding

Only 11 (42.3%) studies adequately performed blinding of outcome assessors (Ali Faisal 2016; Beckie 2010; Cossette 2012; Farias-Godoy

2013; Grace 2016; Hwang 2017; Jolly 1999; Kraal 2014; Mosleh 2014; Parry 2009; Price 2012). For ten studies, this could not be determined (Ashe 1993; Benz Scott 2013; Carroll 2007; Dolansky 2011; Focht 2004; McGrady 2014; Oldridge 1983; Pfaeffli Dale 2015; Suskin 2007; Wyer 2001), and for five studies, this method was not satisfactory (Bertelsen 2017; Lynggaard 2017; McPaul 2007; Pack 2013; Varnfield 2014). Again, due to the nature of the interventions, blinding of participants and personnel to treatment allocation was not deemed possible. So this is likely a source of bias in all included trials.

Incomplete outcome data

This domain is somewhat conflated with the review outcomes of adherence and completion. Nevertheless, investigators rarely reported reasons for loss to follow-up and for dropout, and they rarely performed intention-to-treat analyses. Only six (23.0%) studies adequately addressed incomplete data (Beckie 2010; Farias-Godoy 2013; Grace 2016; Jolly 1999; Kraal 2014; Pack 2013).

Selective reporting

Most studies reported all outcomes described in the Methods section or in their associated protocol. Only one (3.8%) study had high risk of bias for selective reporting of outcomes (Dolansky 2011).

Other potential sources of bias

Some other potential sources of bias should be considered. First, some studies applied unsupervised programmes as a means to increase utilisation. These programmes do not consist of typical on-site sessions. Therefore, adherence would be operationalised, as, for example, completing exercise diaries (Varnfield 2014), or logging in to an online system (Varnfield 2014). Thus for these trials, operationalisation of adherence would be different in both arms. Moreover, it could be argued that completing online sessions rather than going on-site in person for a discharge assessment are not highly comparable. Therefore, results provided by studies with unsupervised or hybrid arms should be considered closely (Ali Faisal 2016; Farias-Godoy 2013; Focht 2004; Grace 2016; Hwang 2017; Kraal 2014; Pfaeffli Dale 2015; Varnfield 2014). Second, in the CR4HER trial, a number of participants switched treatment groups (Grace 2016).

Effects of interventions

See: **Summary of findings for the main comparison** Interventions to promote patient utilisation of cardiac rehabilitation

Additional Table 1 shows results of the meta-regression when we found a sufficient number of trials in each subgroup to run the analysis.

Primary outcomes

Enrolment

Compared with control, the effects of interventions to increase enrolment were meaningful (16 trials; 19 comparisons; risk ratio (RR) 1.27, 95% confidence interval (CI) 1.13 to 1.42; participants = 3096; I^2 = 61%; low-quality evidence; Analysis 1.1). Heterogeneity was moderate.

Additional Table 1 shows the numbers of participants for subgroup analyses through meta-regression. The following factors were related to enrolment: intervention deliverer and delivery format. Analysis 1.5 and Analysis 1.6 display the forest plots. As shown, interventions targeting nurses or allied healthcare providers and delivered with at least some face-to-face element were more effective. For the other subgroup analyses that could be performed (i.e. intervention intensity, theory-based intervention, peer navigation, intervention target, outcome ascertainment, multi-centre study, cardiac indication, region and setting of CR), results show no differences between groups. Sensitivity analysis for risk of bias showed that the effect was consistent in trials at low risk (Analysis 1.13). Sensitivity analysis that removed the cluster randomised controlled trial Jolly 1999 did not alter the main finding (Analysis 1.14).

Adherence

Eight of 11 trials reported sufficient information for extraction or computation of standard deviations and operationalised adherence as per the definition herein; these trials reported the same numbers of prescribed sessions across all comparisons and hence could be pooled for meta-analysis. The number of trials was insufficient for performance of meta-regression.

Regarding the trials that could not be quantitatively pooled, Pack 2013 showed no differences in adherence rates with early initiation of CR (within 10 days of hospital discharge) than with usual access timing (i.e. 35 days). Bertelsen 2017 showed no improvement in adherence with a community-based model in which multiple healthcare workers provided care (including primary care) versus usual hospital-based CR. Finally, McGrady 2014 showed that four-session motivational interviewing and stress management/relaxation in addition to standard CR intervention resulted in significantly less dropout when compared with standard CR alone.

Results of meta-analysis revealed low-quality evidence suggesting that interventions to increase adherence had a positive effect (eight trials; nine comparisons; standardised mean difference (SMD) 0.38, 95% CI 0.20 to 0.55; participants = 1654; I^2 = 53%; Analysis 1.15). Heterogeneity was moderate. Subgroup analyses suggest that interventions were more effective when CR was delivered in an unsupervised setting (SMD 0.56, 95% CI 0.37 to 0.76; participants = 451; studies = 5; I^2 = 6%; test for subgroup differences P < 0.00001; Analysis 1.20). These findings should not be over-interpreted however, given, for instance that only five small studies looked at settings. Ohe other subgroup analyses that could be performed (i.e. intervention deliverer, delivery format, theory-based intervention, multi-centre study, cardiac indication and region) revealed no differences between groups.

Sensitivity analysis for risk of bias showed that the effect was consistent in trials at low risk (Analysis 1.23).

Completion

Compared with controls, the effects of interventions to increase CR completion were promising (7 trials; 8 comparisons; RR 1.13, 95% CI 1.02 to 1.25; participants = 1565; I^2 = 47%; moderate-quality evidence; Analysis 1.24). The number of trials was insufficient for meta-regression to be undertaken. Sensitivity analysis for risk of bias showed that the effect was consistent in trials at low risk (Analysis 1.32).

Heterogeneity was moderate. Note that in the forest plot, the effect size for Varnfield 2014 is considerably larger than for the other

studies, and this could be the source of some heterogeneity. Close consideration of the effect of this trial is warranted.

Subgroup analysis through meta-analysis (additional Table 1) revealed that the following factor was related to greater completion: number of sites (RR 1.46, 95% CI 1.17 to 1.82; participants = 388; studies = 3; I^2 = 8%; Analysis 1.28). Single-site studies more often resulted in greater completion than multi-site ones, suggesting that there may be an issue for generalisability of the interventions tested. The other subgroup analyses that could be performed (i.e. intervention intensity, intervention deliverer, delivery format, theory-based intervention, intervention target, cardiac indication, region and setting of CR, intervention timing, CR programme duration) showed no differences between groups.

Secondary outcomes

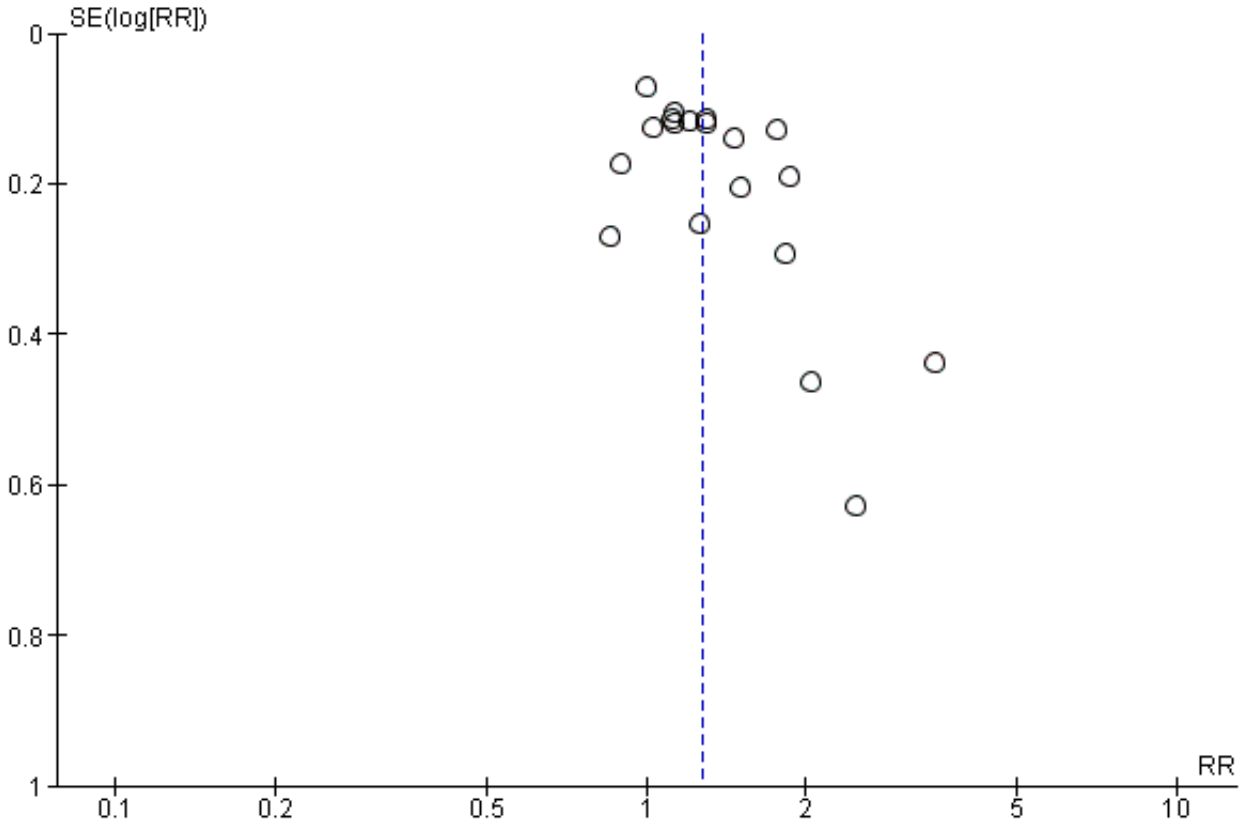
Information on the harms of utilisation interventions was not reported. In both trials reporting on costs, the approach used to increase utilisation was to deliver CR outside of a hospital setting. In one of the two studies that examined cost (Kraal 2014), researchers suggested that home-based CR may be more cost-effective than traditional supervised CR from a societal perspective. In the other study (Bertelsen 2017), study authors stated that average costs to deliver CR in the hospital versus shared between primary care and community were comparable, as were productivity losses in participants, in either model. They suggested that the shared care model could be cost-effective.

In terms of equity, investigators tested interventions designed to improve utilisation among women (Beckie 2010; Grace 2016; Price 2012), as well as among older patients (Carroll 2007; Dolansky 2011; Focht 2004), but review authors could not pool these data quantitatively. With regard to the former, results suggest that offering alternative models including women-only programmes alone may not be effective in increasing utilisation (Grace 2016), but tailoring existing models to meet women's unique needs by providing a motivational orientation may be effective (Beckie 2010). For older participants, peer navigation or postdischarge visits may improve enrolment, and group sessions promoting self-regulation skills may increase completion. No studies compared intervention effects by subpopulation.

Publication bias

We could not generate funnel plots for adherence and completion, as we identified too few studies. The funnel plot for enrolment is shown in Figure 4. The funnel plot showed a degree of asymmetry, but this was not supported by statistical analysis (Egger's test; P = 0.24).

Figure 4. Funnel plot of comparison: 1 CR utilisation, outcome: 1.1 Enrolment.



Quality of evidence from randomised controlled trials

Based on the GRADE method (GRADEpro GDT), we determined that the quality of evidence was low for enrolment and adherence, and was moderate for completion (Summary of findings for the main comparison). We downgraded the evidence for the outcomes of enrolment and adherence due to heterogeneity across studies and

indirectness (mostly male samples). We downgraded the evidence for completion due to indirectness (mostly male samples).

DISCUSSION

Cardiac rehabilitation (CR) supports recovery from coronary events and reduces the risk of future morbidity and mortality. Despite this, utilisation of CR is below recommended levels, especially in certain subgroups, including women. The aim of this systematic review was to determine the effects of interventions to increase patient enrolment in, adherence to, or completion of CR.

Summary of main results

Primary outcomes

Enrolment in cardiac rehabilitation

In this first quantitative pooling of trials of interventions to increase CR enrolment, it is established that such approaches are indeed successful, resulting in 27% greater enrolment than is observed with usual care. Heterogeneity is substantial, suggesting that some strategies are more effective than others. Interventions may be more successful if delivered by nurses or other allied healthcare professionals (e.g. physiotherapists), face-to-face, although further research is required to explore true effects, given the reported P values.

Adherence to cardiac rehabilitation

Researchers also found strategies to increase CR adherence to be effective. Unsupervised delivery appears to be key to increasing programme adherence.

Completion of cardiac rehabilitation

Again, in this first quantitative pooling of trials of interventions to increase CR completion, it is established that such approaches are indeed successful, resulting in 13% greater completion than is observed with usual care. However, caution is warranted, as heterogeneity is moderate, and effects are greater in single-centre versus multi-centre studies. None of the other characteristics that could be examined were meaningful.

Secondary outcomes

Harms or adverse effects of interventions to increase CR utilisation are not considered in the literature.

No trial considered the cost of delivering a utilisation intervention specifically. Given the nature of some of the interventions (e.g. healthcare providers making postdischarge home visits), these costs could be considerable and should be quantified in future trials. These costs would substantially impact implementation in the real world. Some tested interventions however could be particularly low cost (e.g. motivational letter by Wyer 2001), and hence could be scaled up across the cardiac population.

It is encouraging that researchers specifically tested some interventions to increase CR utilisation in under-represented groups. Qualitative analysis suggests that gender-tailored programmes with a motivational orientation may promote utilisation among women. For older patients, researchers identified a few promising interventions.

Overall completeness and applicability of evidence

Despite the fact that some included studies considered women and older patients specifically, most study participants included in this review were middle-aged male patients with acute coronary syndrome (± revascularisation). More studies in this review included patients with heart failure (HF) (only 13 participants in Duncan 2003 from the previous Karmali 2014), which is encouraging, given that this is now a recognised indication for CR (Yancy 2013), yet such patients may avoid exercise due to fear of placing excessive strain on the heart or because of functional limitations. The identification of effective techniques to increase CR utilisation in people with HF may, therefore, be particularly valuable.

Ethnicity often was not reported within the included studies (nine studies; 36.0%). Comorbidity burden or risk factors, such as diabetes (11 studies; 44%), smoking status (six studies; 24%), and depression (five studies; 20%), were seldom reported. This is a major gap given the impact of these factors on CR utilisation.

The identified studies have evaluated a range of different techniques to increase utilisation. As evidenced by the degree of heterogeneity, interventions were usually multi-faceted, and researchers studied many different combinations of techniques. Very few studies evaluated a single intervention strategy. Moreover, all aspects of the interventions were not consistently reported in accordance with reporting guidelines (Hoffman 2014), nor was content provided open source, such that the interventions could be readily replicated and tested. Although this review provides preliminary evidence that interventions to increase CR enrolment should be delivered face-to-face by a nurse or an allied healthcare provider, and that adherence interventions should alternatively be delivered remotely, we can provide little guidance on what the content of the structured contacts should entail.

In a literature review, Beswick identified a broad range of suggested interventions for increasing utilisation of CR (Beswick 2004), most of which have not been formally evaluated. Non-randomised studies have tested other interventions, which warrant testing in randomised controlled trials (RCTs), including systematic referral for augmenting enrolment (Grace 2011), among other quality improvement approaches (Pack 2013).

Few to no interventions identified in reviews have specifically targeted multi-level barriers (Resurrección 2018), such as those at the health system, provider, programme, and patient levels. Moreover, interventions have rarely targeted barriers frequently cited by patients (Clark 2012; Clark 2013; Shanmugasegaram 2011). Several studies did address transport difficulties and inconvenient timing by offering CR in unsupervised settings. Only one study identified illness perceptions of targeted patients (Cossette 2012). Given the failure to identify specific approaches to increase completion, factors associated with utilisation following referral, as reviewed in Taylor 2011, warrant consideration.

Quality of the evidence

Although the quality of reporting tended to be poorer for older studies and was improved in studies included from the updated search, this update reveals limitations in available RCT evidence examining interventions to promote utilisation of CR. Several studies have not provided enough detail to allow assessment of

their potential risk of bias (Figure 2; Figure 3). Study authors have not consistently described details of allocation concealment and blinding of outcomes assessment. Most trials insufficiently addressed incomplete outcome data (primarily due to losses to follow-up or dropouts) and rarely reported or performed intention-to-treat analyses. It is reassuring to note that sensitivity analyses for two utilization outcomes that could be tested show no substantial moderation of effect when only trials at low risk of bias are included.

The interventions evaluated were varied and were often multi-faceted, limiting our ability to determine consistency of findings. The small body of evidence for adherence in particular and the multi-faceted nature of the interventions evaluated mean that study findings are highly heterogeneous. In addition to indirectness due to homogeneity of included participants, this heterogeneity resulted in the GRADE rating of low to moderate for all outcomes.

Potential biases in the review process

Due to the nature of the interventions, blinding of participants and personnel to treatment allocation was not possible. Instead, we evaluated blinding of outcome assessors. Nevertheless, the lack of blinding of participants and personnel may introduce a potential source of bias in all these studies.

Finally, as outlined above, utilisation measurement in supervised and unsupervised settings may not be comparable. Careful consideration of outcome ascertainment in such trials is needed in future research.

Agreements and disagreements with other studies or reviews

An observational study has suggested that offering too much reassurance and optimism to patients about their recovery during CR discussions at the bedside may be associated with reduced enrolment (Pourhabib 2014). Although none of the interventions tested in the included studies were associated with significantly lower utilisation, it remains clear that the content of structured communications during interventions should be considered and standardised.

The safety and comparable efficacy of CR offered in non-supervised settings have been well established (Anderson 2017; Huang 2015; Rawstorn 2016), and thus there should be no concern about harm in this regard. One trial did look at cost, and results suggest potentially lower costs with home-based versus traditional CR (Kraal 2014). However, the Cochrane Review on this topic suggests equivalent costs of home versus supervised CR, concluding that an economic benefit is not likely associated with CR offered in alternative settings.

AUTHORS' CONCLUSIONS

Implications for practice

This review reveals that interventions can increase utilisation of CR. The quality of evidence is low to moderate due to heterogeneity of the interventions used among other factors. Effects on enrolment were larger in studies where the intervention was delivered face-to-face by a nurse or an allied healthcare provider, whereas the effect on adherence was larger in studies where the intervention was delivered remotely. These results should not be over-interpreted, as trials supporting these subgroup analyses were few and had relatively small sample sizes. The resource implications of face-to-face contacts with patients, particularly post-acute care discharge, warrant serious consideration, as they may not be feasible.

Implications for research

Interventions to promote greater CR utilisation among patients of lower socioeconomic status, as well as in ethnocultural minority groups, are greatly needed. Studies have not reported intervention effects by these characteristics. Given recommendations for sex- and gender-based analyses as well, all future trials should report results of these (Institute of Medicine 2012). Further trials of gender-tailored CR with mixed-sex comparison arms are needed to provide sufficient power to test whether or not this approach increases utilisation. Other strategies intended to increase use among women have been recently reviewed and should perhaps be the subject of an RCT (Supervia 2017). Intervention effectiveness in patients with HF and in those with comorbidities also remains to be tested. At this time, no well-established interventions are known to increase CR utilisation in under-represented groups.

As there is a good rationale for increasing utilisation of CR, further high-quality research is needed to examine how the interventions work and to ensure that they are replicable. Pooling of these diverse interventions is not informative for practice if there is no commonality and no understood mechanism. Interventions should be standardised/manualised for ready testing in real-world practice with barriers to utilisation in mind. Evaluation of single strategies will make it easier to identify the "active ingredients" of interventions. Moreover, the beneficial and adverse effects of these interventions should be studied within the context of the costs and resources that they require.

ACKNOWLEDGEMENTS

We would like to thank Mark Berendsen for undertaking the search update, and Roland B. Buchter for providing article translation assistance. We would also like to thank Andrew Beswick, Nicole Martin, Shah Ebrahim, Kunal Kamali, Karen Rees, Tiffany Moxham, Ingolf Griebsch, Madeline Burke, Robert R. West, J Victory, Juliet Brown, and Frances Wise - the authors of previous versions of this Cochrane review.

REFERENCES

References to studies included in this review

Ali Faisal 2016 *{published data only}*

Ali-Faisal SF, Benz Scott L, Johnston, L, Grace SL. Cardiac rehabilitation referral and enrolment across an academic health sciences centre with eReferral and peer navigation: a randomised controlled pilot trial. *BMJ Open* 2016;**6**(3):e010214. [DOI: https://dx.doi.org/10.1136/bmjopen-2015-010214]

Ashe 1993 *{published data only}*

Ashe ED. The effects of a relapse prevention program on adherence to a phase II cardiac exercise program. The Effects of a Relapse Prevention Program on Adherence to a Phase II Cardiac Exercise Program [PhD dissertation]. Tallahassee (FL): Florida State University, 1993.

Beckie 2010 *{published data only}*

Beckie TM. A behavior change intervention for women in cardiac rehabilitation. *Journal of Cardiovascular Nursing* 2006;**21**(2):146-53.

* Beckie TM, Beckstead JW. Predicting cardiac rehabilitation attendance in a gender-tailored randomized clinical trial. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2010;**30**(3):147-56.

Beckie TM, Beckstead JW, Schocken DD, Evans ME, Fletcher GF. The effects of a tailored cardiac rehabilitation program on depressive symptoms in women: a randomized clinical trial. *International Journal of Nursing Studies* 2011;**48**:3-12.

Benz Scott 2013 *{published data only}*

Benz Scott L, Gravely S, Sexton T, Brzostek S, Brown DL. Effect of patient navigation on enrollment in cardiac rehabilitation. *JAMA Internal Medicine* 2013;**11**(173):244-6.

* Benz Scott L, Gravely S, Sexton TR, Brzostek S, Brown DL. Examining the effect of a patient navigation intervention on outpatient cardiac rehabilitation awareness and enrollment. *Journal of Molecular Signaling* 2013;**33**(5):281-91. [DOI: https://dx.doi.org/10.1097/HCR.0b013e3182972dd6]

Bertelsen 2017 *{published data only}*

Bertelsen JB, Refsgaard J, Kanstrup H, Johnsen SP, Qvist I, Christensen B, et al. Hospital-based versus community-based shared care cardiac rehabilitation after acute coronary syndrome: protocol for a randomized clinical trial. *Danish Medical Journal* 2013;**60**(9):1-5.

* Bertelsen JB, Refsgaard J, Kanstrup H, Johnsen SøP, Qvist I, Christensen B, et al. Cardiac rehabilitation after acute coronary syndrome comparing adherence and risk factor modification in a community-based shared care model versus hospital-based care in a randomised controlled trial with 12 months of follow-up. *European Journal of Cardiovascular Nursing* 2017;**16**(4):334-43. [DOI: 10.1177/1474515116666781]

Carroll 2007 *{published data only}*

Carroll DL, Rankin SH, Cooper BA. The effects of a collaborative peer advisor / advanced practice nurse intervention and rehospitalization in older adults after a cardiac event. *Journal of Cardiovascular Nursing* 2007;**22**(4):313-9.

Cossette 2012 *{published data only}*

Cossette S, Frasure-Smith N, Dupuis J, Juneau M, Guertin MC. Randomized controlled trial of tailored nursing interventions to improve cardiac rehabilitation enrollment. *Nursing Research* 2012;**61**(2):111-20.

Dolansky 2011 *{published data only}*

Dolansky MA, Zullo MD, Boxer RS, Moore SM. Initial efficacy of a cardiac rehabilitation transition program: Cardiac TRUST. *Journal of Gerontological Nursing* 2011;**37**(12):36-44.

Farias-Godoy 2013 *{published data only}*

Farias-Godoy A, Chan S, Claydon VE, Ignaszewski A, Mendell J, Park JE, et al. The impact of reduced cardiac rehabilitation on maximal treadmill exercise time: a randomized controlled trial. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2018;**1**:24-30.

* Farias-Godoy AF. Design, implementation and evaluation of a reduced cardiac rehabilitation program. Design, Implementation and Evaluation of a Reduced Cardiac Rehabilitation Program [PhD dissertation]. Burnaby (BC): Simon Fraser University, 2013.

Focht 2004 *{published data only}*

Focht BC, Brawley LR, Rejeski WJ, Ambrosius WT. Group-mediated activity counseling and traditional exercise therapy programs: effects on health-related quality of life among older adults in cardiac rehabilitation. *Annals of Behavioral Medicine* 2004;**28**(1):52-61.

Grace 2016 *{published data only}*

* Grace SL, Midence L, Oh P, Brister S, Chessex C, Stewart DE, et al. Cardiac rehabilitation program adherence and functional capacity among women: a randomized controlled trial. *Mayo Clinic Proceedings* 2016;**91**(2):140-8. [DOI: https://dx.doi.org/10.1016/j.mayocp.2015.10.021]

Midence L. Women's cardiac rehabilitation program adherence and health behaviours following referral to three different program models: a randomized controlled trial. Women's Cardiac Rehabilitation Program Adherence and Health Behaviours Following Referral to Three Different Program Models: A Randomized Controlled Trial [PhD dissertation]. Toronto, Ontario, Canada: York University, 2015:1-246.

Hwang 2017 *{published data only}*

Hwang R, Bruning J, Morris NR, Mandrusiak A, Russell T. Home-based telerehabilitation is not inferior to a centre-based program in patients with chronic heart failure: a randomised trial. *Journal of Physiotherapy* 2017;**63**:101-7. [DOI: 10.1016/j.jphys.2017.02.017]

Jolly 1999 *{published data only}*

Jolly K, Bradley F, Sharp S, Smith H, Mant D. Follow-up care in general practice of patients with myocardial infarction or angina

pectoris: initial results of the SHIP trial. Southampton Heart Integrated Care Project. *Family Practice* 1998;**15**(6):548-55.

* Jolly K, Bradley F, Sharp S, Smith H, Thompson S, Kinmonth AL, et al. Randomised controlled trial of follow up care in general practice of patients with myocardial infarction and angina: final results of the Southampton Heart Integrated Care Project (SHIP). The SHIP Collaborative Group. *BMJ* 1999;**318**(7185):706-11.

Kraal 2014 *{published data only}*

Kraal JJ, Peek N, Akker-Van Marle ME, Kemps HMC. Effects and costs of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: the FIT@Home study. *BMC Cardiovascular Disorders* 2013;**13**(82):1-9.

Kraal JJ, Peek N, Van den Akker-Van Marle ME, Kemps HM. Effects of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: short-term results of the FIT@Home study. *European Journal of Prevenventive Cardiology* 2014;**21**(2 Suppl):26-31. [DOI: doi:10.1177/2047487317710803]

* Kraal JJ, Van den Akker-Van Marle ME, Abu-Hanna A, Stut W, Peek N, Kemps HM. Clinical and cost-effectiveness of home-based cardiac rehabilitation compared to conventional, centre-based cardiac rehabilitation: results of the FIT@Home study. *European Journal of Prevenventive Cardiology* 2017;**24**(12):1260-73.

Lynggaard 2017 *{published data only}*

Lynggaard V, May O, Beauchamp A, Nielsen CV, Wittrup I. LC-REHAB: randomised trial assessing the effect of a new patient education method - learning and coping strategies – in cardiac rehabilitation. *BMC Cardiovascular Disorders* 2014;**14**(186):1-9.

* Lynggaard V, Nielsen CV, Zwisler AD, Taylor RS, May O. The patient education - learning and coping strategies - improves adherence in cardiac rehabilitation (LC-REHAB): a randomised controlled trial. *International Journal of Cardiology* 2017;**1**(236):65-70. [DOI: 10.1016/j.ijcard.2017.02.051]

McGrady 2014 *{published data only}*

McGrady A, Burkes R, Badenhop D, McGinnis R. Effects of a brief intervention on retention of patients in a cardiac rehabilitation program. *Applied Psychophysiology and Biofeedback* 2014;**39**(3-4):163-70. [DOI: https://dx.doi.org/10.1007/s10484-014-9252-y]

McPaul 2007 *{published data only}*

McPaul J. Home Visit Versus Telephone Follow-up in Phase II Cardiac Rehabilitation Following Myocardial Infarction [MSc dissertation]. Chester, UK: University of Chester, 2007.

Mosleh 2014 *{published data only}*

* Mosleh SM, Bond CM, Lee AJ, Kiger A, Campbell NC. Effectiveness of theory-based invitations to improve attendance at cardiac rehabilitation: a randomized controlled trial. *European Journal of Cardiovascular Nursing* 2014;**13**(3):201-10. [DOI: https://dx.doi.org/10.1177/1474515113491348]

Mosleh SM, Kiger A, Campbell N. Improving uptake of cardiac rehabilitation: using theoretical modelling to design an intervention. *European Journal of Cardiovascular Nursing* 2008;**8**:161-8.

Oldridge 1983 *{published data only}*

Oldridge NB, Jones NL. Improving patient compliance in cardiac exercise rehabilitation: effects of written agreement and self-monitoring. *Journal of Cardiac Rehabilitation* 1983;**3**:257-62.

Pack 2013 *{published data only}*

Pack QR, Mansour M, Barboza JS, Hibner BA, Mahan MG, Ehrman JK, et al. An early appointment to outpatient cardiac rehabilitation at hospital discharge improves attendance at orientation: a randomized, single-blind, controlled trial. *Circulation* 2013;**127**(3):349-55.

Parry 2009 *{published data only}*

Parry MJ, Watt-Watson J, Hodnett E, Tranmer J, Dennis CL, Brooks D. Cardiac home education and support trial (CHEST): a pilot study. *Canadian Journal of Cardiology* 2009;**25**(12):e393-8.

Pfaeffli Dale 2015 *{published data only}*

Pfaeffli Dale L, Whittaker R, Jiang Y, Stewart R, Rolleston A, Maddison R. Improving coronary heart disease self-management using mobile technologies (Text4Heart): a randomised controlled trial protocol. *Trials* 2014;**15**(71):1-9.

* Pfaeffli Dale L, Whittaker R, Jiang Y, Stewart R, Rolleston A, Maddison R. Text message and internet support for coronary heart disease self-management: results from the Text4Heart randomized controlled trial. *Journal of Medical Internet Research* 2015;**17**(10):e237. [DOI: https://dx.doi.org/10.2196/jmir.4944]

Price 2012 *{published data only}*

Price J. A Pilot Trial of a Coaching Intervention Designed to Increase Women's Attendance at Cardiac Rehabilitation Intake [PhD thesis]. Toronto, Ontario, Canada: University of Toronto, 2012.

Suskin 2007 *{published data only}*

Suskin N, Irvine J, Arnold JMO, Turner R, Zandri J, Prior P, et al. Improving cardiac rehabilitation participation in women and men, the CR participation study. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2007;**27**(5):342.

Varnfield 2014 *{published data only}*

* Varnfield M, Karunanithi M, Lee CK, Honeyman E, Arnold D, Ding H, et al. Smartphone-based home care model improved use of cardiac rehabilitation in post myocardial infarction patients: results from a randomised controlled trial. *Heart* 2014;**100**(22):1770-9. [DOI: https://dx.doi.org/10.1136/heartjnl-2014-305783]

Walters DL, Sarela A, Fairfull A, Neighbour K, Cowen C, Stephens B, et al. A mobile phone-based care model for outpatient cardiac rehabilitation: the care assessment platform (CAP). *BMC Cardiovascular Disorders* 2010;**10**(5):1-8.

Wyer 2001 *{published data only}*

Wyer SJ, Earll L, Joseph S, Harrison J, Giles M, Johnston M. Increasing attendance rates at a cardiac rehabilitation programme: an intervention study using the Theory of Planned Behaviour. *Coronary Health Care* 2001;**5**:154-9.

References to studies excluded from this review

Aamot 2014 *{published data only}*

Aamot IL, Forbord SH, Gustad K, Lockra V, Stensen A, Berg AT, et al. Home-based versus hospital-based high-intensity interval training in cardiac rehabilitation: a randomized study. *European Journal of Preventive Cardiology* 2014;**21**(9):1070-8. [DOI: https://dx.doi.org/10.1177/2047487313488299]

Antypas 2014 *{published data only}*

Antypas K, Wangberg SC. An Internet- and mobile-based tailored intervention to enhance maintenance of physical activity after cardiac rehabilitation: short-term results of a randomized controlled trial. *Journal of Medical Internet Research* 2014;**16**(3):e77. [DOI: https://dx.doi.org/10.2196/jmir.3132]

Arietaleanizbeascoa 2015 *{published data only}*

Arietaleanizbeascoa MS, Arce V, Domingo M, Torcal J, Sanz A, Gomez M, et al. Supervised exercise programme in primary care to improve quality of life and functional capacity for heart failure patients. *European Journal of Heart Failure* 2015;**17**:356. [DOI: 10.1002/ejhf.277]

Arrigo 2008 *{published data only}*

Arrigo I, Brunner-LaRocca H, Lefkovits M, Pfisterer M, Hoffmann A. Comparative outcome one year after formal cardiac rehabilitation: the effects of a randomized intervention to improve exercise adherence. *European Journal of Cardiovascular Prevention and Rehabilitation* 2008;**15**(3):306–11.

Barkley 2013 *{published data only}*

Barkley SA, Fahrenwald NL. Evaluation of an intervention to increase self-efficacy for independent exercise in cardiac rehabilitation. *Behavioral Medicine* 2013;**39**(4):104-10. [DOI: https://dx.doi.org/10.1080/08964289.2013.804804]

Berg 2015 *{published data only}*

Berg SK, Pedersen PU, Zwisler AD, Winkel P, Gluud C, Pedersen BD, et al. Comprehensive cardiac rehabilitation improves outcome for patients with implantable cardioverter defibrillator. Findings from the COPE-ICD randomised clinical trial. *European Journal of Cardiovascular Nursing* 2015;**14**(1):34-44. [DOI: https://dx.doi.org/10.1177/1474515114521920]

Bikmoradi 2016 *{published data only}*

Bikmoradi A, Masmouei B, Ghomeisi M, Roshanaei G. Impact of tele-nursing on adherence to treatment plan in discharged patients after coronary artery bypass graft surgery: a quasi-experimental study in Iran. *International Journal of Medical Informatics* 2016;**86**:43-8. [DOI: https://dx.doi.org/10.1016/j.ijmedinf.2015.12.001]

Blumenthal 2016 *{published data only}*

Blumenthal JA, Sherwood A, Smith PJ, Watkins L, Mabe S, Kraus WE, et al. Enhancing cardiac rehabilitation with stress management training: a randomized clinical efficacy trial. *Circulation* 2016;**133**(14):1341-50. [DOI: 10.1161/CIRCULATIONAHA.115.018926]

Borg 2017 *{published data only}*

Borg S, Oberg B, Nilsson L, Soderlund A, Back M. The role of a behavioural medicine intervention in physiotherapy for the effects of rehabilitation outcomes in exercise-based cardiac rehabilitation (ECRA) - the study protocol of a randomised, controlled trial. *BMC Cardiovascular Disorders* 2017;**17**(1):134.

Boyne 2014 *{published data only}*

Boyne JJ, Vrijhoef HJ, Spreeuwenberg M, De Weerd G, Kragten J, Gorgels AP, et al. Effects of tailored telemonitoring on heart failure patients' knowledge, self-care, self-efficacy and adherence: a randomized controlled trial. *European Journal of Cardiovascular Nursing* 2014;**13**(3):243-52. [DOI: https://dx.doi.org/10.1177/1474515113487464]

Bubnova 2014 *{published data only}*

Bubnova MG, Aronov DM, Krasnitskii VB, Ioseliani DG, Novikova NK, Rodzinskaia EM. A home exercise training program after acute coronary syndrome and/or endovascular coronary intervention: efficiency and a patient motivation problem. *Terapevticheskii Arkhiv* 2014;**86**(1):23-32.

Çavuşoğlu 2017 *{published data only}*

Çavuşoğlu Y, Zoghi M, Eren M, Bozçalı E, Kozdağ G, Şentürk T, et al. Post-discharge heart failure monitoring program in turkey: hit-point. *Anatolian Journal of Cardiology* 2017;**17**(2):107-12. [DOI: 10.14744/AnatolJCardiol.2016.6812]

CebrickGrossman 2010 *{published data only}*

Cebrick-Grossman J. Uptake of a phase II cardiac rehabilitation program with systematic interventions for patients diagnosed with an acute myocardial infarction. Uptake of a Phase II Cardiac Rehabilitation Program With Systematic Interventions for Patients Diagnosed With an Acute Myocardial Infarction. Center Valley, PA: Marywood University, 2010:103p.

CebrickGrossman 2016 *{published data only}*

Cebrick-Grossman JA. Cardiac rehabilitation enrollment and the impact of systematic nursing interventions for postmyocardial infarction and stent patients. *Clinical Nursing Research* 2016;**25**(4):378-90.

Chair 2012 *{published data only}*

Chair SY, Chan SW, Thompson DR, Leung KP, Ng SK, Choi KC. Short-term effect of motivational interviewing on clinical and psychological outcomes and health-related quality of life in cardiac rehabilitation patients with poor motivation in Hong Kong: a randomized controlled trial. *European Journal of Preventive Cardiology* 2012;**19**(6):1383-92. [DOI: https://dx.doi.org/10.1177/1741826711425428]

Chokshi 2018 *{published data only}*

Chokshi NP, Adusumalli S, Small DS, Morris A, Feingold J, Ha YP, et al. Loss-framed financial incentives and personalized goal-

setting to increase physical activity among ischemic heart disease patients using wearable devices: the ACTIVE REWARD randomized trial. *Journal of the American Heart Association* 2018;**7**(12):e009173.

Claes 2017 *{published data only}*

Claes J, Buys R, Woods C, Briggs A, Geue C, Aitken M, et al. PATHway I: design and rationale for the investigation of the feasibility, clinical effectiveness and cost-effectiveness of a technology-enabled cardiac rehabilitation platform. *BMJ Open* 2017;**7**(6):e016781.

Cooper 2016 *{published data only}*

Cooper LB, Mentz RJ, Sun JI, Schulte PJ, Fleg JI, Cooper LS, et al. Psychosocial factors, exercise adherence, and outcomes in heart failure patients: insights from heart failure: a controlled trial Investigating outcomes of exercise training (HF-ACTION). *Circulation. Heart Failure* 2016;**8**(6):1044-51. [DOI: 10.1161/CIRCHEARTFAILURE.115.002327]

Daltroy 1985 *{published data only}*

Daltroy LH. Improving cardiac patient adherence to exercise regimens: a clinical trial of health education. *Journal of Cardiac Rehabilitation* 1985;**5**:40-9.

Dankner 2015 *{published data only}*

Dankner R, Drory Y, Geulayov G, Ziv A, Novikov I, Zlotnick AY, et al. A controlled intervention to increase participation in cardiac rehabilitation. *European Journal of Preventive Cardiology* 2015;**22**(9):1121-8. [DOI: https://dx.doi.org/10.1177/2047487314548815]

Devi 2014 *{published data only}*

Devi R, Powell J, Singh S. A web-based program improves physical activity outcomes in a primary care angina population: randomized controlled trial. *Journal of Medical Internet Research* 2014;**16**(9):e186. [DOI: https://dx.doi.org/10.2196/jmir.3340]

Doletsky 2014 *{published data only}*

Doletsky A, Andreev DA, Martynova VV, Svet AV. Skype and tele-ECG in control of home-based exercise training after planned PCI - a useful tool?. *European Journal of Preventive Cardiology* 2014;**21**(2):42. [DOI: 10.1177/2047487314553173]

Dougherty 2015 *{published data only}*

Dougherty CM, Glenny RW, Burr RL, Flo GL, Kudenchuk PJ. Prospective randomized trial of moderately strenuous aerobic exercise after an implantable cardioverter defibrillator. *Circulation* 2015;**131**(21):1835-42. [DOI: https://dx.doi.org/10.1161/CIRCULATIONAHA.114.014444]

Duncan 2003 *{published data only}*

Duncan K, Pozehl B. Effects of an exercise adherence intervention on outcomes in patients with heart failure. *Rehabilitation Nursing* 2003;**28**(4):117-22.

Duncan 2014 *{published data only}*

Duncan K, Pozehl B, Hertzog M, Norman JF. Psychological responses and adherence to exercise in heart failure. *Rehabilitation Nursing* 2014;**39**(3):130-9. [DOI: https://dx.doi.org/10.1002/rnj.106]

Everson-Rose 2016 *{published data only}*

Everson-Rose S. Mindfulness & stress management study for cardiac patients. clinicaltrials.gov/ct2/show/nct02722213 (first received 29 March 2016).

Frederix 2013a *{published data only}*

Frederix I, Hansen D, Berger J, Van Driessche N, Bonne K, Alders T, et al. The effect of an internet-based telerehabilitation programme on the physical fitness of coronary artery disease patients after the acute rehabilitation phase. *Acta Cardiologica* 2013;**68**(1):114-5. [DOI: 10.2143/AC.68.1.2959636]

Frederix 2013b *{published data only}*

Frederix I, Hansen D, Berger J, Bonne K, Van Driessche N, Dendale P. The influence of a web-based tele-rehabilitation program on the physical fitness of coronary artery disease patients after the acute rehabilitation phase. *European Journal of Preventive Cardiology* 2013;**20**(1):S133. [DOI: 10.1177/2047487314530052]

Frederix 2014 *{published data only}*

Frederix I, Van Driessche N, Hansen D, Berger J, Bonne K, Alders T, et al. Cost reduction by an internet-based telerehabilitation program in coronary artery disease patients after the acute rehabilitation phase. *European Journal of Preventive Cardiology* 2014;**21**(1):S103. [DOI: 10.1177/2047487314534582]

Frederix 2015 *{published data only}*

Frederix I, Hansen D, Coninx K, Vandervoort P, Vandijck D, Hens N, et al. Medium-term effectiveness of a comprehensive Internet-based and patient-specific telerehabilitation program with text messaging support for cardiac patients: randomized controlled trial. *Journal of Medical Internet Research* 2015;**17**(7):e185. [DOI: https://dx.doi.org/10.2196/jmir.4799]

Frederix 2016 *{published data only}*

Frederix I, Hansen D, Coninx K, Vandervoort P, Vandijck D, Hens N, et al. Effect of comprehensive cardiac telerehabilitation on one-year cardiovascular rehospitalization rate, medical costs and quality of life: a cost-effectiveness analysis. *European Journal of Preventive Cardiology* 2016;**23**(7):674-82. [DOI: https://dx.doi.org/10.1177/2047487315602257]

Fulton 2011 *{published data only}*

Fulton RL, Witham MD, Greig C, Johnston D, Lang CC, Van Der Pol M, et al. A randomised controlled trial of exercise training for older heart failure patients. *Age and Ageing* 2011;**40**:ii9. [DOI: 10.1093/ageing/afr099]

Gaalema 2016 *{published data only}*

Gaalema DE, Savage PD, Rengo JL, Cutler AY, Higgins ST, Ades PA. Financial incentives to promote cardiac rehabilitation participation and adherence among Medicaid patients. *Preventive Medicine* 2016;**92**:47-50.

Garcia 2013 *{published data only}*

Garcia JP, Giraldo VM, Barrado JJ, Casasola CD. Tennis training sessions as a rehabilitation instrument for patients after acute myocardial infarction. *Journal of Sports Science and Medicine* 2013;**12**(2):316-22.

Hawkes 2013 *{published data only}*

Hawkes AL, Patrao TA, Atherton J, Ware RS, Taylor CB, O'Neil A, et al. Effect of a telephone-delivered coronary heart disease secondary prevention program (proactive heart) on quality of life and health behaviours: primary outcomes of a randomised controlled trial. *International Journal of Behavioral Medicine* 2013;**20**(3):413-24. [DOI: https://dx.doi.org/10.1007/s12529-012-9250-5]

Hillebrand 1995 *{published data only}*

Hillebrand T, Frodermann H, Lehr D, Wirth A. Increased participation in coronary groups by means of an outpatient care program [Vermehrte Teilnahme an ambulaten Herzgruppen durch poststationare Nachsorge]. *Herz Kreislauf* 1995;**27**:346-9.

Irazusta-Cordoba 2017 *{published data only}*

Irazusta-Cordoba FJ, Blazquez-Bermejo Z, Castro-Conde A, Dalmau-Gonzalez-Gallarza R, Velez-Salas A, Hernandez-Munoz D, et al. Impact of an intensive program on the outcomes of cardiac rehabilitation: MAS POR MENOS study. *European Journal of Preventive Cardiology* 2017;**24**(1):S36.

Izawa 2005 *{published data only}*

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

Kaminsky 2013 *{published data only}*

Kaminsky L, Ozemek C, Riggin K, Byun W, Strath S. Pedometer feedback - superior for increasing daily physical activity in cardiac rehabilitation patients. *Circulation* 2013;**127**(12):AP176.

Kidholm 2016 *{published data only}*

Kidholm K, Rasmussen MK, Andreasen JJ, Hansen J, Nielsen G, Spindler H, et al. Cost-utility analysis of a cardiac telerehabilitation program: the Teledialog Project. *Telemedicine Journal and E-health* 2016;**22**(7):553-63.

Korzeniowska-Kubacka 2014 *{published data only}*

Korzeniowska-Kubacka I, Bilinska M, Dobraszkiewicz-Wasilewska B, Piotrowicz R. Comparison between hybrid and standard centre-based cardiac rehabilitation in female patients after myocardial infarction: a pilot study. *Kardiologia Polska* 2014;**72**(3):269-74. [DOI: https://dx.doi.org/10.5603/KP.a2013.0283]

Korzeniowska Kubacka 2015 *{published data only}*

Korzeniowska-Kubacka I, Bilinska M, Dobraszkiewicz-Wasilewska B, Piotrowicz R. Hybrid model of cardiac rehabilitation in men and women after myocardial infarction. *Cardiology Journal* 2015;**22**(2):212-8. [DOI: https://dx.doi.org/10.5603/CJ.a2015.0004]

Lear 2014 *{published data only}*

Lear SA, Singer J, Banner-Lukaris D, Horvat D, Park JE, Bates J, et al. Randomized trial of a virtual cardiac rehabilitation program delivered at a distance via the internet. *Circulation* 2014;**7**(6):952-9.

Lear 2015 *{published data only}*

Lear SA, Singer J, Banner-Lukaris D, Horvat D, Park JE, Bates J, et al. Improving access to cardiac rehabilitation using the internet: a randomized trial. *Studies in Health Technology and Informatics* 2015;**209**:58-66.

Lewinter 2014 *{published data only}*

Lewinter C, Thygesen L, Doherty P, Kober L, Zwisler AD. Effectiveness of cardiac rehabilitation in HF patients: a long-term follow-up of the DANREHAB-trial. *European Journal of Heart Failure* 2014;**16**:60. [DOI: 10.1002/ejhf.93_4]

Li 2015 *{published data only}*

Li X, Xu S, Zhou L, Li R, Wang J. Home-based exercise in older adults recently discharged from the hospital for cardiovascular disease in China: randomized clinical trial. *Nursing Research* 2015;**64**(4):246-55. [DOI: https://dx.doi.org/10.1097/NNR.0000000000000102]

Mayer Berger 2016 *{published data only}*

Mayer-Berger WJ, Schroeer S, Pieper C. Positive effects of long-term adherence to Viniyoga in high-risk cardiac rehabilitation patients with systolic blood pressure between 140-160 mmHg Refonet. *European Journal of Preventive Cardiology* 2016;**23**:S15. [DOI: 10.1177/2047487316668118]

Melin 2014 *{published data only}*

Melin M, Hagglund E, Frie F, Lynga P, Ullman B, Persson H, et al. Patient-centered home-based management of heart failure, findings from a randomized clinical trial evaluating effects on knowledge, self-care and quality of life. *European Heart Journal* 2014;**35**:838. [DOI: 10.1093/eurheartj/ehu324]

Meng 2016 *{published data only}*

Meng K, Musekamp G, Schuler M, Seekatz B, Glatz J, Karger G, et al. The impact of a self-management patient education program for patients with chronic heart failure undergoing inpatient cardiac rehabilitation. *Patient Education and Counseling* 2016;**99**(7):1190-7. [DOI: 10.1016/j.pec.2016.02.010]

Mohammadi 2018 *{published data only}*

Mohammadi N, Aghayousefi A, Nikrahan GR, Adams CN, Alipour A, Sadeghi M. A randomized trial of an optimism training intervention in patients with heart disease. *General Hospital Psychiatry* 2018;**51**:46-53.

Moholdt 2012 *{published data only}*

Moholdt T, Bekken Vold M, Grimsmo J, Slordahl SA, Wisloff U. Home-based aerobic interval training improves peak oxygen uptake equal to residential cardiac rehabilitation: a randomized, controlled trial. *PLoS ONE* 2012;**7**(7):e41199. [DOI: https://dx.doi.org/10.1371/journal.pone.0041199]

Moore 2006 *{published data only}*

Moore SM, Charvat JM, Gordon NH, Pashkow F, RibislP, Roberts BL, et al. Effects of a CHANGE intervention to increase exercise maintenance following cardiac events. *Annals of Behavioral Medicine* 2006;**31**(1):53-62.

Murray 2014 *{published data only}*

Murray KA, Murphy DJ, Clements SJ, Brown A, Connolly SB. Comparison of uptake and predictors of adherence in primary and secondary prevention of cardiovascular disease in a community-based cardiovascular prevention programme (MyAction Westminster). *Journal of Public Health* 2014;**36**(4):644-50. [DOI: https://dx.doi.org/10.1093/pubmed/fdt118]

O'Neil 2012 *{published data only}*

O'Neil A, Hawkes A, Atherton J, Patrao T, Taylor C, Oldenburg B. Telephone-delivered, health coaching improves psychological outcomes after myocardial infarction: the 'proactive heart' trial. *Heart Lung and Circulation* 2012;**21**:S315. [DOI: 10.1016/j.hlc.2012.05.779]

Oerkild 2012 *{published data only}*

Oerkild B, Frederiksen M, Hansen JF, Prescott E. Home-based cardiac rehabilitation is an attractive alternative to no cardiac rehabilitation for elderly patients with coronary heart disease: results from a randomised clinical trial. *BMJ Open* 2012;**2**(6):e001820. [DOI: https://dx.doi.org/10.1136/bmjopen-2012-001820]

Pandey 2016 *{published data only}*

Pandey AK, Patel T, Suskin N, Choudhry N. Education as a determinant of adherence to pharmacological and lifestyle interventions post-myocardial infarction. *Canadian Journal of Cardiology* 2016;**32**:S158.

Pandey 2017 *{published data only}*

Pandey A. Novel strategies to improve cardiometabolic status and adherence to exercise regimens in patients at high risk for cardiovascular disease (BURST). clinicaltrials.gov/ct2/show/nct03103854 (first received 6 April 2017).

Pattyn 2016 *{published data only}*

Pattyn N, Vanhees L, Cornelissen VA, Coeckelberghs E, De Maeyer C, Goetschalckx K, et al. The long-term effects of a randomized trial comparing aerobic interval versus continuous training in coronary artery disease patients: 1-year data from the SAINTEX-CAD study. *European Journal of Preventive Cardiology* 2016;**23**(11):1154-64. [DOI: 10.1177/2047487316631200]

PeclatFlores 2015 *{published data only}*

Peclat Flores PV, Arruda CS, Cavalcanti ACD, Pereira JMV, Scofano BS, Rocha BL, et al. Effect of a group orientation in self-care and compliance of patients with heart failure. *European Journal of Heart Failure* 2015;**17**:165. [DOI: 10.1002/ejhf.277]

Peixoto 2015 *{published data only}*

Peixoto TC, Begot I, Bolzan DW, Machado L, Reis MS, Papa V, et al. Early exercise-based rehabilitation improves health-related quality of life and functional capacity after acute myocardial infarction: a randomized controlled trial. *Canadian Journal of Cardiology* 2015;**31**(3):308-13. [DOI: https://dx.doi.org/10.1016/j.cjca.2014.11.014]

PfaeffliDale 2015a *{published data only}*

PfaeffliDale L, Whittaker R, Dixon R, Stewart R, Jiang Y, Carter K, et al. Acceptability of a mobile health exercise-based cardiac rehabilitation intervention: a randomized trial. *Journal of Molecular Signal* 2015;**35**(5):312-9. [DOI: https://dx.doi.org/10.1097/HCR.0000000000000125]

Piotrowicz 2012 *{published data only}*

Piotrowicz E, Barbara DW, Grzebielichowski A, Jasionowska A, Maria BB, Gwilkowska J, et al. New model of home telemonitored cardiac rehabilitation based on nordic walking training in patients with heart failure: safety, effectiveness and compliance. *Circulation* 2012;**125**(19):e719. [DOI: 10.1161/CIR.0b013e31824fcd6b]

Piotrowicz 2015 *{published data only}*

Piotrowicz E, Zielinski T, Bodalski R, Rywik T, Dobraszkiewicz-Wasilewska B, Sobieszczanska-Malek M, et al. Home-based telemonitored Nordic walking training is well accepted, safe, effective and has high adherence among heart failure patients, including those with cardiovascular implantable electronic devices: a randomised controlled study. *European Journal of Preventive Cardiology* 2015;**22**(11):1368-77. [DOI: https://dx.doi.org/10.1177/2047487314551537]

Poortaghi 2013 *{published data only}*

Poortaghi S, Baghernia A, Golzari SE, Safayian A, Atri SB. The effect of home-based cardiac rehabilitation program on self efficacy of patients referred to cardiac rehabilitation center. *BMC Research Notes* 2013;**6**:287. [DOI: https://dx.doi.org/10.1186/1756-0500-6-287]

Reyes 2013 *{published data only}*

Reyes JMA, Ruiz FM, Canete JA, Luque GN, Zafra RM, Gamez MG, et al. Secondary prevention of cardiovascular events: is an educational intervention helpful? A randomized clinical trial. *European Journal of Cardiovascular Nursing* 2013;**12**:S39. [DOI: 10.1177/1474515113477019]

Rodrigues 2013 *{published data only}*

Rodrigues RC, Joao TM, Gallani MC, Cornelio ME, Alexandre NM. The "Moving Heart Program": an intervention to improve physical activity among patients with coronary heart disease. *Revista Latino-Americana de Enfermagem* 2013;**21 Spec No**:180-9.

Ruivo 2017 *{published data only}*

Ruivo JM, Karim K, O'Shea R, Oliveira RCS, Keary L, O'Brien C, et al. In-class active videogame supplementation and adherence to cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2017;**37**(4):274-8. [DOI: 10.1097/HCR.0000000000000224]

Safiyari Hafizi 2016 *{published data only}*

Safiyari-Hafizi H, Taunton J, Ignaszewski A, Warburton DE. The health benefits of a 12-week home-based interval training cardiac rehabilitation program in patients with heart failure.

Canandian Journal of Cardiology 2016;**32**(4):561-7. [DOI: https://dx.doi.org/10.1016/j.cjca.2016.01.031]

Sangster 2015 *{published data only}*

Sangster J, Furber S, Allman-Farinelli M, Phongsavan P, Redfern J, Haas M, et al. Effectiveness of a pedometer-based telephone coaching program on weight and physical activity for people referred to a cardiac rehabilitation program: a randomized controlled trial. *Journal of Molecular Signaling* 2015;**35**(2):124-9. [DOI: https://dx.doi.org/10.1097/HCR.0000000000000082]

Sanjuan 2016 *{published data only}*

Sanjuan P, Montalbetti T, Perez-Garcia AM, Bermudez J, Arranz H, Castro A. A randomised trial of a positive Intervention to promote well-being in cardiac patients. *Applied Psychology Health Well Being* 2016;**8**(1):64-84. [DOI: https://dx.doi.org/10.1111/aphw.12062]

Shahriari 2013 *{published data only}*

Shahriari M, Ahmadi M, Babaee S, Mehrabi T, Sadeghi M. Effects of a family support program on self-care behaviors in patients with congestive heart failure. *Iranian Journal of Nursing Midwifery Research* 2013;**18**(2):152-7.

Skobel 2017 *{published data only}*

Skobel E, Knackstedt C, Martinez-Romero A, Salvi D, Vera-Munoz C, Napp A, et al. Internet-based training of coronary artery patients: the Heart Cycle Trial. *Heart and Vessels* 2017;**32**(4):408-18. [DOI: 10.1007/s00380-016-0897-8]

Sniehotta 2006 *{published data only}*

Sniehotta F, Scholz U, Schwarzer R. Action plans and coping plans for physical exercise: a longitudinal intervention study in cardiac rehabilitation. *British Journal of Health Psychology* 2006;**11**(1):23-37.

Takase 2015 *{published data only}*

Takase K, Matsuo Y, Yanagisawa Y, Higashine K, Oda M, Manabe M, et al. Efficacy of a home-based exercise program for recently hospitalized chronic heart failure patients. *Physiotherapy* 2015;**101**:eS1477. [DOI: 10.1016/j.physio.2015.03.1448]

terHoeve 2018 *{published data only}*

ter Hoeve N, Sunamura M, Stam HJ, Boersma E, Geleijnse ML, van Domburg RT, et al. Effects of two behavioral cardiac rehabilitation interventions on physical activity: a randomized controlled trial. *International Journal of Cardiology* 2018;**255**:221-8.

Turkstra 2013 *{published data only}*

Turkstra E, Hawkes AL, Oldenburg B, Scuffham PA. Cost-effectiveness of a coronary heart disease secondary prevention program in patients with myocardial infarction: results from a randomised controlled trial (ProActive Heart). *BMC Cardiovascular Disorders* 2013;**13**:33. [DOI: https://dx.doi.org/10.1186/1471-2261-13-33]

Uysal 2015 *{published data only}*

Uysal H, Ozcan S. The effect of individual education on patients' physical activity capacity after myocardial infarction. *International Journal of Nursing Practice* 2015;**21**(1):18-28. [DOI: https://dx.doi.org/10.1111/ijn.12193]

Vahedian Azimi 2016 *{published data only}*

Vahedian-Azimi A, Miller AC, Hajiesmaieli M, Kangasniemi M, Alhani F, Jelvehmoghaddam H, et al. Cardiac rehabilitation using the family-centered empowerment model versus home-based cardiac rehabilitation in patients with myocardial infarction: a randomised controlled trial. *Open Heart* 2016;**3**(1):e000349. [DOI: https://dx.doi.org/10.1136/openhrt-2015-000349]

Vanhees 2014 *{published data only}*

Vanhees L. Telerehabilitation in coronary heart disease (TRiCH). clinicaltrials.gov/ct2/show/nct02047942 (first received January 28 2014).

Widmer 2017 *{published data only}*

Widmer RJ, Allison TG, Lennon R, Lopez-Jimenez F, Lerman LO, Lerman A. Digital health intervention during cardiac rehabilitation: a randomized controlled trial. *American Heart Journal* 2017;**188**:65-72.

Wieczorrek 2016 *{published data only}*

Wieczorrek G, Weber U, Wienke A, Egner E, Schroder J, Vogt A. Adherence to phase III cardiac rehabilitation programs: a prospective, randomized comparison between a conventionally conducted program and a Tai Chi-based program [Adhärenz in Herzgruppen: Ein prospektiver, randomisierter Vergleich einer konventionell durchgefuhrten Herzgruppe zu einer Tai-Chi-Herzgruppe]. *Sportverletzung Sportschaden* 2016;**30**(2):95-100.

Wojcieszczyk 2012 *{published data only}*

Wojcieszczyk J, Kalka D, Bugaj R, Szczepanska-Gieracha J, Grzebieniak T, Kucharski W, et al. Impact of different cardiac rehabilitation programs on exertion tolerance, quality of life and depression in women with ischemic heart disease. *European Journal of Preventive Cardiology* 2012;**19**(1):S28. [DOI: 10.1177/2047487312448007]

Wolszakiewicz 2015 *{published data only}*

Wolszakiewicz J, Piotrowicz E, Foss-Nieradko B, Dobraszkiewicz-Wasilewska B, Piotrowicz R. A novel model of exercise walking training in patients after coronary artery bypass grafting. *Kardiologia Polska* 2015;**73**(2):118-26. [DOI: https://dx.doi.org/10.5603/KP.a2014.0165]

Wood 2016 *{published data only}*

Wood PW, Padwal RS. Feasibility and effectiveness of remote virtual reality-based cardiac rehabilitation. clinicaltrials.gov/ct2/show/nct02711631 (first received 17 March 2016).

Young 2016 *{published data only}*

Young L, Hertzog M, Barnason S. Effects of a home-based activation intervention on self-management adherence and readmission in rural heart failure patients: the PATCH randomized controlled trial. *BMC Cardiovascular Disorders* 2016;**16**(1):1. [DOI: 10.1186/s12872-016-0339-7]

References to studies awaiting assessment

Ivers 2017 *{published data only}*

Ivers N, Schwalm JD, Witteman HO, Presseau J, Taljaard M, McCready T, et al. Interventions supporting long-term adherence and decreasing cardiovascular events (ISLAND): pragmatic randomized trial protocol. *American Heart Journal* 2017;**190**:64-75.

LaValley 2017 *{published data only}*

* La Valley GA, Szalai H, Pack QR, Storer A. A telephone intervention to improve patient return rates in cardiac rehabilitation: a pilot study. AACVPR 32nd Annual Meeting Scientific Abstract Presentations. 2017; Vol. 37, issue 5:S209.

Pack Q, Visintainer P, Farah M, LaValley G, Szalai H, Lindenauer PK. Risk stratification for non-adherence in cardiac rehabilitation: a simple tool. AACVPR 33rd Annual Meeting Scientific Abstract Presentations. 2018; Vol. 38:S108.

Rouleau 2017 *{published data only}*

Rouleau C, King-Shier KM, Tomfohr-Madsen LM, Bacon SL, Aggarwal S, Arena R, et al. The evaluation of a brief motivational intervention to promote intention to participate in cardiac rehabilitation: a randomized controlled trial. *Patient Education and Counseling* 2018;**101**:1914-1923.

Sunamura 2018 *{published data only}*

Sunamura M, Ter Hoeve N, Van Den Berg-Emons RJG, Geleijnse ML, Haverkamp M. Randomised controlled trial of two advanced and extended cardiac rehabilitation programmes. *Heart* 2018;**104**(5):430-7.

Suskin 2006 *{published data only}*

Suskin N. Evaluation of an introductory videotape intervention to improve cardiac rehabilitation participation. clinicaltrials.gov/ct2/show/nct00372671 (first received 7 September 2006).

Taylor 2010a *{published data only}*

Taylor GH. Improving cardiac rehabilitation session attendance: a randomised controlled trial. clinicaltrials.gov/ct2/show/results/NCT00956657 (first received 11 August 2010).

References to ongoing studies

Collela 2016 *{published data only}*

Collela T. My Cardiac Recovery (MyCaRe): a pilot RCT. clinicaltrials.gov/ct2/show/NCT02778165 (first received 19 May 2016).

Gaalema 2014 *{published data only}*

Gaalema D. Increasing cardiac rehabilitation participation among Medicaid enrollees. clinicaltrials.gov/ct2/show/NCT02172820 (first received 24 June 2014).

Suhar 2016 *{published data only}*

Suhar C, Stuart E. Healing touch intervention in post-cardiac event patients prior to starting a cardiac rehab program. clinicaltrials.gov/ct2/show/NCT02695134 (first received 1 March 2016).

Additional references

Ajzen 1986

Ajzen I, Madden TJ. Prediction of goal-directed behaviour: attitudes, intentions and perceived behavioural control. *Journal of Experimental Social Psychology* 1986;**22**:453-74.

Amsterdam 2014

Amsterdam EA, Wenger NK, Brindis RG, Casey DE Jr, Ganiats TG, Holmes DR Jr, et al. 2014 AHA/ACC guideline for the management of patients with non–ST-elevation acute coronary syndromes. *Journal of the American College of Cardiology* 2014;**64**(24):e139-e228.

Anderson 2016

Anderson L, Thompson DR, Oldridge N, Zwisler AD, Rees K, Martin N, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database of Systematic Reviews* 2016, Issue 1. [DOI: 10.1002/14651858.CD001800.pub3]

Anderson 2017

Anderson L, Sharp GA, Norton RJ, Dalal H, Dean SG, Jolly K, et al. Home-based versus centre-based cardiac rehabilitation. *Cochrane Database of Systematic Reviews* 2017, Issue 6. [DOI: 10.1002/14651858.CD007130.pub4]

BACPR 2012

British Association for Cardiovascular Prevention and Rehabilitation (BACPR). Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation [http://www.bacpr.com/resources/8BZ_BACPR_Standards_and_Core_Components_2012.pdf]. The BACPR. 2nd. London, UK: BACPR, (accessed 14 February 2018).

BACPR 2017

British Association for Cardiovascular Prevention and Rehabilitation (BACPR). Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation. http://www.bacpr.com/resources/AC6_BACPRStandards&CoreComponents2017.pdf. 3rd. London, UK: British Association for Cardiovascular Prevention and Rehabilitation, (accessed 23 June 2018).

Beatty 2018

Beatty AL, Truong M, Schopfer DW, Shen H, Bachmann JM, Whooley MA. Geographic variation in cardiac rehabilitation participation in Medicare and Veterans Affairs populations: opportunity for improvement. *Circulation* 2018;**137**(18):1899-908. [PUBMED: 17893274]

Borenstein 2009

Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. Meta-regression. Introduction to Meta-analysis. New York, NY: John Wiley & Sons Ltd, 2009.

Clark 2012

Clark AM, King-Shier KM, Thompson DR, Spaling MA, Duncan AS, Stone JA, et al. A qualitative systematic review of influences on attendance at cardiac rehabilitation programs after referral. *American Heart Journal* 2012;**164**:835–45.

Clark 2013

Clark AM, King-Shier KM, Spaling MA, Duncan AS, Stone JA, Jaglal SB, et al. Factors influencing participation in cardiac rehabilitation programmes after referral and initial attendance: qualitative systematic review and meta-synthesis. *Clinical Rehabilitation* 2013;**27**(10):948-59.

Colbert 2014

Colbert JD, Martin BJ, Haykowsky MJ, Hauer TL, Austford LD, Arena RA, et al. Cardiac rehabilitation referral, attendance and mortality in women. *European Journal of Preventive Cardiology* 2014;**22**:979–86.

COVIDENCE [Computer program]

Veritas Health Innovation. Covidence systematic review software. Melbourne, Australia: Veritas Health Innovation, 2014.

Davies 2010b

Davies EJ, Moxham T, Rees K, Singh S, Coats AJ, Ebrahim S, et al. Exercise based rehabilitation for heart failure. *Cochrane Database of Systematic Reviews* 2010, Issue 4. [DOI: 10.1002/14651858.CD003331.pub3]

Doll 2015

Doll JA, Hellkamp A, Thomas L, Ho PM, Kontos MC, Whooley MA, et al. Effectiveness of cardiac rehabilitation among older patients after acute myocardial infarction. *American Heart Journal* 2015;**170**:855-64.

Egger 1997

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

Fihn 2012

Fihn SD, Gardin JM, Abrams J, Berra K, Blankenship JC, Dallas AP, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: executive summary. *Circulation* 2012;**126**:357-471.

Grace 2011

Grace SL, Russell KL, Reid RD, Oh P, Anand S, Rush J, et al. Effect of cardiac rehabilitation referral strategies on utilization rates: a prospective, controlled study. *Archives of Internal Medicine* 2011;**171**(3):235-41.

GRADEpro GDT [Computer program]

McMaster University. GRADEpro Guideline Development Tool [accessed 8 May 2018]. Hamilton, Canada: McMaster University, 2015.

Hammill 2010

Hammill BBG, Curtis LHL, Schulman K, Whellan DJ. Relationship between cardiac rehabilitation and long-term risks of death and myocardial infarction among elderly medicare beneficiaries. *Circulation* 2010;**121**:63-70.

Heran 2011

Heran BS, Chen JM, Ebrahim S, Moxham T, Oldridge N, Rees K, et al. Exercise-based cardiac rehabilitation for coronary heart disease. *Cochrane Database of Systematic Reviews* 2011, Issue 7. [DOI: 10.1002/14651858.CD001800.pub2]

Higgins 2011

Higgins JP, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. www.cochrane-handbook.org (accessed 26 April 2017).

Hillis 2011

Hillis LD, Smith PK, Anderson JL, Bittl JA, Bridges CR, Bryne JG, et al. 2011 ACCF/AHA guideline for coronary artery bypass graft surgery: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2011;**124**(23):e652-735.

Hoffman 2014

Hoffmann T, Glasziou P, Boutron I, Milne R, Perera R, Moher D, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014;**348**:g1687.

Huang 2015

Huang K, Liu W, He D, Huang B, Xiao D, Peng Y, et al. Telehealth interventions versus center-based cardiac rehabilitation of coronary artery disease: a systematic review and meta-analysis. *European Journal of Preventive Cardiology* 2015;**22**(8):959-71.

Institute of Medicine 2012

Institute of Medicine Board on Population Health and Public Health Practice. Sex-Specific Reporting of Scientific Research: A Workshop Summary. Washington (DC): National Academies Press, 2012.

Kachur 2017

Kachur S, Chongthammakun V, Lavie CJ, De Schutter A, Arena R, Milani RV, et al. Impact of cardiac rehabilitation and exercise training programs in coronary heart disease. *Progress in Cardiovascular Diseases* 2017;**60**:103-14.

Kotseva 2018

Kotseva K, Wood D, De Bacquer D, EUROASPIRE Investigators. Determinants of participation and risk factor control according to attendance in cardiac rehabilitation programmes in coronary patients in Europe: EUROASPIRE IV survey. *European Journal of Preventive Cardiology* 2018;**25**(12):1242-51.

Lefebvre 2011

Lefebvre C, Manheimer E, Glanville J. Chapter 6: Searching for studies. In: Higgins JP, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. www.cochrane-handbook.org (accessed 26 April 2017).

Levine 2011

Levine GN, Bates ER, Blankenship JC, Bailey SR, Bittl JA, Cercek B, et al. 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention. *Journal of the American College of Cardiology* 2011;**58**(24):e44-e122.

Levine 2016

Levine GN, Bates ER, Blankenship JC, Bailey SR, Bittl JA, Cercek B, et al. 2015 ACC/AHA/SCAI Focused update on primary percutaneous coronary intervention for patients with ST-elevation myocardial infarction: an update of the 2011 ACCF/AHA/SCAI guideline for percutaneous coronary intervention and the 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction. *Journal of the American College of Cardiology* 2016;**67**:1235-50.

Matata 2017

Matata BM, Williamson SA. A review of interventions to improve enrolment and attendance to cardiac rehabilitation among patients aged 65 years of above. *Current Cardiology Reviews* 2017;**13**(4):252-62.

Mosca 2011

Mosca L, Benjamin EJ, Berra K, Bezanson JL, Dolor RJ, Lloyd-Jones DM, et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women - 2011 update: a guideline from the American Heart Association. *Circulation* 2011;**123**(11):1243-62.

NACR 2017

British Heart Foundation. National Audit of Cardiac Rehabilitation (NACR) Annual Statistical Report 2017. www.bhf.org.uk/informationsupport/publications/statistics/national-audit-of-cardiac-rehabilitation-annual-statistical-report-2017 (accessed 31 October 2017):1-72.

O'Gara 2013

O'Gara PT, Kushner FG, Ascheim DD, Casey DE Jr, Chung MK, de Lemos JA, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013;**124**(4):e362-e425.

Oosenbrug 2016

Oosenbrug E, Marinho RP, Zhang J, Marzolini S, Colella TJF, Pakosh M, et al. Sex differences in cardiac rehabilitation adherence: a meta-analysis. *Canadian Journal of Cardiology* 2016;**32**:1316–24.

Peters 2017

Peters AE, Keeley EC. Trends and predictors of participation in cardiac rehabilitation following acute myocardial infarction: data from the behavioral risk factor surveillance system. *Journal of the American Heart Association* 2017;**7**(1):1-6.

Pourhabib 2014

Pourhabib S, Kentner AC, Grace SL. The impact of patient-healthcare provider discussions on enrollment in cardiovascular rehabilitation. *Journal of Rehabilitation Medicine* 2014;**46**(9):924-31.

Rawstorn 2016

Rawstorn JC, Gant N, Direito A, Beckman C, Maddison R. Telehealth exercise-based cardiac rehabilitation: a systematic review and meta-analysis. *Heart* 2016;**102**:1183-92.

Resurrección 2018

Resurrección DM, Moreno-Peral P, Gómez-Herranz M, Rubio-Valera M, Pastor L, Caldas de Almeida JM, et al. Factors associated with non-participation in and dropout from cardiac rehabilitation programmes: a systematic review of prospective cohort studies. *European Journal of Cardiovascular Nursing* 2018;**ePub**(0):1-10. [PUBMED: 17329279]

RevMan 2014 [Computer program]

TheNordic Cochrane Centre, The Cochrane Collaboration. Review Manager (RevMan). Version accessed 18 April 2017. Copenhagen, Denmark: TheNordic Cochrane Centre, The Cochrane Collaboration, 2014.

Samayoa 2014

Samayoa L, Grace SL, Gravely S, Scott LB, Marzolini S, Colella T, et al. Sex differences in cardiac rehabilitation enrollment: a meta-analysis. *Canadian Journal of Cardiology* 2014;**30**:793-800.

Santiago de Araujo Pio 2017

Santiago de Araujo Pio C, Marzolini S, Pakosh M, Grace SL. Dose of cardiac rehabilitation across the globe. Toronto General Research Institute Research Day. Toronto, Canada, 2016.

Shanmugasegaram 2011

Shanmugasegaram S, Gagliese L, Oh P, et al. Psychometric validation of the cardiac rehabilitation barriers scale. *Clinical Rehabilitation* 2012;**26**(2):152-64.

Smith 2011

Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, et al. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update: a guideline from the American Heart Association and American College of Cardiology Foundation. *Circulation* 2011;**124**(22):2458-73.

STATA 2017 [Computer program]

StataCorp LLC. Stata Statistical Software: Release 15. Version accessed 8 December 2017. College Station, TX: StataCorp LLC, 2017.

Supervia 2017

Supervia M, Medina-Inojosa JR, Yeung C, Lopez-Jimenez F, Squires RW, Pérez-Terzic CM, et al. Cardiac rehabilitation for women: a systematic review of barriers and solutions. *Mayo Clinic Proceedings* 2017;**92**(4):565-77.

Taylor 2010b

Taylor RS, Dalal H, Jolly K, Moxham T, Zawada A. Home-based versus centre-based cardiac rehabilitation. *Cochrane Database of Systematic Reviews* 2010, Issue 1. [DOI: 10.1002/14651858.CD007130.pub2]

Taylor 2011

Taylor GH, Wilson SL, Sharp J. Medical, psychological, and sociodemographic factors associated with adherence to cardiac rehabilitation programs: a systematic review. *Journal of Cardiovascular Nursing* 2011;**26**(3):202-9.

Turk-Adawi 2015

Turk-Adawi KI, Grace SL. Narrative review comparing the benefits of and participation in cardiac rehabilitation in high-, middle- and low-income countries. *Heart Lung Circulation* 2015;**24**(5):510-20.

Whalley 2011

Whalley B, Rees K, Davies P, Bennett P, Ebrahim S, Liu Z, et al. Psychological interventions for coronary heart disease. *Cochrane Database of Systematic Reviews* 2011, Issue 8. [DOI: 10.1002/14651858.CD002902.pub3]

Whellan 2009

Whellan DJ, Shaw LK, Bart BA, Kraus WE, Califf RM, O'Connor CM. Cardiac rehabilitation and survival in patients with left ventricular systolic dysfunction. *American Heart Journal* 2009;**54**:25-33.

WHO 2014

World Health Organization. Global Status Report on Noncommunicable Diseases 2014. Geneva, Switzerland: World Health Organization, 2014.

Wong 2006

Wong SS, Wilczynski NL, Haynes RB. Developing optimal search strategies for detecting clinically sound treatment studies in EMBASE. *Journal of the Medical Library Association* 2006;**94**(1):41-7.

Wong 2006b

Wong SS, Wilczynski NL, Haynes RB. Optimal CINAHL search strategies for identifying therapy studies and review articles. *Journal of Nursing Scholarship* 2016;**38**(2):194-9.

Yancy 2013

Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Journal of the American College of Cardiology* 2013;**62**(16):e147-e239.

References to other published versions of this review

Beswick 2004

Beswick AD, Rees K, Griebsch I, Taylor FC, Burke M, West RR, et al. Provision, uptake and cost of cardiac rehabilitation programmes: improving services to under-represented groups. Health Technology Assessment 2004; Vol. 8, issue 41.

Beswick 2005

Beswick AD, Rees K, West RR, Taylor FC, Burke M, Griebsch I, et al. Improving uptake and adherence in cardiac rehabilitation: literature review. *Journal of Advanced Nursing* 2005;**49**(5):538-55.

Davies 2010a

Davies P, Taylor F, Beswick A, Wise F, Moxham T, Rees K, et al. Promoting patient uptake and adherence in cardiac rehabilitation. *Cochrane Database of Systematic Reviews* 2010, Issue 7. [DOI: 10.1002/14651858.CD007131.pub2]

Karmali 2014

Karmali KN, Davies P, Taylor F, Beswick A, Martin N, Ebrahim S. Promoting patient uptake and adherence in cardiac rehabilitation. *Cochrane Database of Systematic Reviews* 2014;**6**:CD007131.

* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

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

Ali Faisal 2016

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Date patients recruited:** May 2014 to December 2014
Participants	**Inclusion criteria:** adult cardiac inpatients eligible for CR with ACS, PCI, CABG, valve surgery, arrhythmia, stable HF, congenital heart disease, and/or non-disabling stroke **Exclusion criteria:** major musculoskeletal, neuromuscular, visual, cognitive, or non-dysphoric psychiatric condition, or any serious or terminal illness; discharged to long-term care; unable to ambulate; not residing in Ontario, Canada **N randomised:** total: 94; intervention: 46; comparator: 48 **N lost to follow-up:** total: 18; intervention: 7; comparator: 11

Ali Faisal 2016 *(Continued)*

	N analysed: total: 76; intervention: 39; comparator: 37 **Age (mean ± SD):** intervention: 62.6 ± 13.1; comparator: 62.7 ± 16.5 **Sex (% women):** intervention: 30.4%; comparator: 31.2% **Race/ethnicity (% white):** intervention: 82.6%; comparator: 83.0%
Interventions	**Intervention:** peer navigation intervention. Participants were visited at the bedside by the CR peer navigator to build rapport and encourage the participant to obtain a CR referral from his or her health-care provider before discharge from the hospital. A "get well soon" card was mailed by the CR navigator to the participant's home. Two weeks after discharge, the CR navigator called the participant to discuss any barriers to CR enrolment **Comparison:** received eReferral system as part of usual care **Theoretical basis:** NR **Intervention provider:** peer **Mode of delivery:** face-to-face + card + telephone call **Time of delivery:** pre-CR **Intervention intensity:** 3 contacts **Intervention target:** patient **Materials provided:** written materials about the benefits of CR **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as patient attendance at first CR programme visit
Notes	**Sponsorship source:** funding from Stony Brook University (United States), Toronto General and Western Hospital Foundation, Peter Munk Cardiac Centre campaign (Canada)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation sequence was generated by a statistician and was stratified by sex in random blocks of 4, 8, and 12
Allocation concealment (selection bias)	Low risk	Random assignment was concealed through the use of opaque envelopes
Blinding of outcome assessment (detection bias) All outcomes	Low risk	CR enrolment and referral were ascertained by a research assistant blinded to random assignment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	15% and 23% of participants in the intervention and control groups, respectively, were lost to follow-up
Selective reporting (reporting bias)	Low risk	The protocol is not available; however study authors verified that all of the study's prespecified (primary and secondary) outcomes of interest to the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Ashe 1993

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** October 1992 to December 1992
Participants	**Inclusion criteria:** patients referred to CR programmes following a variety of heart problems: angina, MI, valve problems, CABG, and coronary artery disease **Exclusion criteria:** NR **N randomised:** total: 41. intervention: 21; comparator: 20 **N lost to follow-up:** none **N analysed:** total: 41; intervention: 21; comparator: 20 **Age (mean ± SD):** intervention: 62.6 ± 13.1; comparator: 62.7 ± 16.5 **Sex (% women):** intervention: 30.4%; comparator: 31.2% **Race/ethnicity (% white):** 95% intervention: 82.6%; comparator: 83.0%
Interventions	**Intervention:** the trial offered a motivational relapse prevention intervention that was delivered during the course of the CR programme. The intervention was started after 4 or 5 exercise sessions. The intervention was based on Marlatt and Gordon's model. Participants received individual sessions, once a week for 3 weeks *Session 1*: based on pretest information, factors found to interfere with adherence were introduced. Participants discussed their perceptions on the value of exercise, listed their goals for the programme, and anticipated outcomes *Session 2*: participants were introduced to decision-making concepts and cognitive interference factors. Discussion with regard to coping with "slips" and introduction to appropriate ways to re-frame perspectives. Participants filled in daily activity sheets *Session 3*: focussed on the importance of lifestyle balance. Participants were asked to refer to daily activity sheets to introduce concepts of shoulds and wants. Stressors were identified that may affect lifestyle balance and were discussed, as was the importance of positive thinking and use of medication **Comparison:** during the course of the exercise programme, participants received a "benign" education intervention, which covered basic exercise concepts, guidelines for proper exercise participation, exercise tips and handouts, and the benefits of exercise **Theoretical basis:** Marlatt and Gordon's relapse prevention model **Intervention provider:** experimenter **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 3 contacts **Intervention target:** patient **Materials provided:** handouts **Tailoring:** NR **CR setting:** supervised
Outcomes	Adherence - defined as total number of prescribed sessions completed

Ashe 1993 *(Continued)*

	Completion - defined as completion of the programme after a follow-up assessment
Notes	**Sponsorship source:** NR

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Allocated to groups by presenting patients with a packet containing a form coded A or B
Allocation concealment (selection bias)	High risk	Allocation was unlikely to have been concealed due to the use of alternate allocation in assigning participants to treatment groups
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	9 (22%) dropouts matched between treatment allocation, but reason not provided
Selective reporting (reporting bias)	Unclear risk	Insufficient information to permit judgement of "low risk" or "high risk". Study protocol not available to identify unreported outcomes
Other bias	Unclear risk	Similarity of groups at baseline unclear

Beckie 2010

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** January 2004 to March 2008
Participants	**Inclusion criteria:** women aged > 21 years old referred to an outpatient CR programme with multiple CHD conditions/procedures (MI, angina, or CABG) and able to read, write, and speak English **Exclusion criteria:** lack of insurance coverage for 36 exercise sessions, cognitive impairment, inability to ambulate, implantation of internal cardiac defibrillator in the last year **N randomised:** total: 252; intervention: 141; comparator: 111 **N lost to follow-up:** total: 11; intervention: 7; comparator: 4 **N analysed:** total: 252; intervention: 141; comparator: 111 **Age (mean ± SD):** intervention: 63.0 ± 11.0; comparator: 64.0 ± 11.0 **Sex (% women):** intervention: 100%; comparator: 100% **Race/ethnicity (% white):** overall: 82%
Interventions	**Intervention:** gender-tailored CR programme in which participants exercised exclusively with women. Psychologists and nurse specialists provided to participants 1-hour individualised motivational interviewing sessions at weeks 1 and 6 based on the transtheoretical model (TTM) of behaviour change. Psychoeducational classes were held weekly before exercise sessions **Comparison:** traditional CR programme based on the case management model that was delivered by female nurses and exercise physiologists. The exercise protocol consisted of aerobic and resistance

Beckie 2010 *(Continued)*

	training 3 days/week for 12 weeks. CR personnel provided educational classes focussed on CHD risk factor modification at 5 different times weekly **Theoretical basis:** transtheoretical model of behaviour change + motivational interviewing **Intervention provider:** research nurse + exercise physiologists **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 36 contacts (delivered during each CR session) **Intervention target:** patient **Materials provided:** 280-page educational manual **Tailoring:** participants received 1-hour individualised motivational interviewing (MI) sessions at weeks 1 and 6 with a clinical psychologist or a clinical nurse specialist formally trained in motivational interviewing focussed on factors affecting women's CR utilisation **CR setting:** supervised
Outcomes	Adherence - defined as exercise session attendance and educational session attendance
Notes	**Sponsorship source:** National Institutes of Health grant 5 RO1 NR007678, Florida, USA

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Biased coin randomisation was performed
Allocation concealment (selection bias)	Low risk	Statistician provided treatment assignment sheets that were placed in opaque envelopes, sealed, and delivered to the project director
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Completely separate and blinded outcome assessors (a dedicated research nurse with no contact with participants during the intervention) collected all 3-month and 6-month follow-up data
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	Low risk	Confirmed with study author that all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	Groups were comparable at baseline, including all major prognostic factors

Benz Scott 2013

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** May 2009 to June 2011

Benz Scott 2013 *(Continued)*

Participants	**Inclusion criteria:** ≥ 21 years old with MI, stable HF, PCI, CABG, or valve surgery **Exclusion criteria:** psychiatric disorders, substance abuse, non-English-speaking, assisted living, did not have a phone **N randomised:** total: 181; intervention: 90; comparator: 91 **N lost to follow-up:** total: 3; intervention: 1; comparator: 2 **N analysed:** total: 178; intervention: 89; comparator: 89 **Age (mean ± SD):** intervention: 60.2 ± 9.9; comparator: 60.7 ± 11.1 **Sex (% women):** intervention: 36.0%; comparator: 31.5% **Race/ethnicity (% white):** intervention: 87.7%; comparator: 85.5%
Interventions	**Intervention:** participant navigators provided basic information and support to participants at hospital bedside, by phone, or by mail. Participants were given information about CR (i.e. likely benefits of participation, locations of local programmes, and details on how to access CR), and their navigator facilitated enrolment into a programme **Comparator:** the control group received standard discharge instructions provided to all participants **Theoretical basis:** NR **Intervention provider:** peer **Mode of delivery:** face-to-face or letter + telephone call **Time of delivery:** pre-CR **Intervention intensity:** 2 contacts **Intervention target:** patient **Materials provided:** letter about the benefits of CR **Tailoring:** NR **CR Setting:** NR
Outcomes	Enrolment - defined as having attended at least 1 outpatient CR session (beyond that for initial intake assessment)
Notes	**Sponsorship source:** funded by Grants for Catalyzing Research Clusters GRANT # MO1RR10710 and a Targeted Research Opportunity Fusion Award, with matching funds provided by the Schools of Medicine and Health Technology & Management

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "All consenting patients were consecutively assigned to either intervention or usual care groups using computer-generated block randomisation"
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Quote: "The in-depth interviews were conducted by a group of survey researchers located at the Center for Survey Research at Stony Brook University who worked independent of the authors/investigative team, and they were not aware of patient assignment while conducting the interviews"

Benz Scott 2013 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were reported
Selective reporting (reporting bias)	Low risk	The study protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	High risk	Despite random assignment to study groups, more participants with HF were included in the usual care group than in the intervention group

Bertelsen 2017

Methods	**Study design:** RCT parallel - 2 arms **Country:** Denmark **Date patients recruited:** October 2011 to March 2013
Participants	**Inclusion criteria:** > 18 to 80 years of age, angiographically documented coronary thrombosis or stenosis, resident in one of the participating municipalities: Aarhus, Viborg, Silkeborg, Skive, Samsø, Favrskov, or Skanderborg; no previous CR **Exclusion criteria:** MI on a non-thrombotic basis, ejection fraction < 40%, lack of physical or mental ability to participate in CR, inability to write and understand Danish without help, other disease causing severe disability **N randomised:** total: 212; intervention: 106; comparator: 106 **N lost to follow-up:** total: 22; intervention: 9; comparator: 13 **N analysed:** total: 190; intervention: 97; comparator: 93 **Age, mean (range) :** intervention: 60 (40 to 79); comparator: 60 (30 to 78) **Sex (% women):** intervention: 29.2%; comparator: 20.7.5% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** CR delivered through shared care. The general practitioner was responsibility for CR components not delivered in the community, as well as for pharmacological treatment and risk factor management after the initial visit to the hospital outpatient clinic. Municipal health care centres provided courses on smoking cessation, nutrition, and exercise training, along with patient education and psychosocial support **Comparison:** CR was delivered entirely within hospital outpatient clinics. CR was terminated upon consultation with a cardiologist concerning risk factors and future medication **Theoretical basis:** NR **Intervention provider:** NA **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 3 contacts **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR

Bertelsen 2017 *(Continued)*

	CR setting: hybrid
Outcomes	Adherence - defined as a composite of participation in different components of the programme (smoking cessation, dietary advice, exercise training, clinical assessment by a doctor, and patient education)
Notes	**Sponsorship source:** funded by the Central Region Denmark as part of the chronic care programme

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer randomisation was performed after consent was obtained
Allocation concealment (selection bias)	Unclear risk	Information was insufficient for judgement; information was not presented in the paper
Blinding of outcome assessment (detection bias) All outcomes	High risk	Study authors declared that blinding was not possible
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were reported
Selective reporting (reporting bias)	Low risk	The study protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Carroll 2007

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** January 2004 to March 2008
Participants	**Inclusion criteria**: > 65 years old, diagnosis of MI or CABG, unpartnered (single, widowed, divorced), able to speak and read English, had access to a telephone **Exclusion criteria:** NR **N randomised:** total: 247; intervention: 126; comparator: 121 **N lost to follow-up:** none **N analysed:** total: 247; intervention: 126; comparator: 121 **Age (mean ± SD):** intervention: 76.4 ± 6.4; comparator: 76.2 ± 6.2 **Sex (% women):** intervention: 63.0%; comparator: 69.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** standard of care plus community-based collaborative peer advisor and advanced practice nurse intervention. The intervention was started within 48 hours of discharge and lasted 12 weeks.

Carroll 2007 *(Continued)*

	A nurse made a home visit and contacted participants over the telephone at least 3 times during the intervention; the peer advisor made weekly calls to participants for 12 weeks **Comparison:** standard of care (CR) **Theoretical basis:** social cognitive theory **Intervention provider:** nurse + peer. Peer advisors were recruited from CR programmes, were older than 60 years, had a history of MI or CABG, had successfully completed a CR programme, and were actively participating in a healthy lifestyle **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 16 contacts **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** supervised
Outcomes	Enrolment - defined as enrolment in a CR programme
Notes	**Sponsorship source:** grant from the National Institute of Nursing Research (RO1 NR05205)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information about the sequence generation process was insufficient to permit judgement of "low risk" or "high risk"
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	High risk	12 participants died and 34 dropped out of the study (18.6% attrition rate). Dropout reasons were not reported
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol was not available to identify unreported outcomes
Other bias	Low risk	The study appears to be free of other sources of bias

Cossette 2012

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Date patients recruited:** October 2006 to September 2009

Cossette 2012 *(Continued)*

Participants	**Inclusion criteria:** adult patients hospitalised for suspected acute coronary syndrome **Exclusion criteria:** discharged to a short-term rehabilitation centre or to long-term care; inability to speak French or English; living more than 50 miles away from the rehabilitation centre; having physical, psychological, or cognitive problems; referred for surgery; already receiving regular outpatient follow-up; previously completed a CR programme; final diagnosis other than acute coronary syndrome **N randomised:** total: 242; intervention: 121; comparator: 121 **N lost to follow-up:** none **N analysed:** 242; intervention: 121; comparator: 121 **Age (mean ± SD):** intervention: 59.4 ± 10.5; comparator: 59.4 ± 9.4 **Sex (% women):** intervention: 19.0%; comparator: 9.9% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** 3 encounters over 10 days. The first encounter was face-to-face and occurred before discharge to address participants' symptoms and physical activity after discharge, understanding of the illness, and concerns and worries. The second encounter occurred 3 days post discharge via telephone call and focussed on participants' clinical condition, including their ability to manage the disease. The third encounter occurred 10 days post discharge via telephone call or hospital meeting with the focus of addressing risk factors and lifestyle modification including CR enrolment **Comparison:** participants were referred to the rehabilitation centre affiliated with the academic hospital and were encouraged to call the rehabilitation centre themselves to schedule an appointment. All study participants received telephone calls from staff to enrol in CR, and those who accepted were scheduled for a first appointment within 6 weeks of discharge **Theoretical basis:** Leventhal's self-regulation theory **Intervention provider:** research nurse + exercise physiologists **Mode of delivery:** face-to-face and telephone call **Time of delivery:** pre-CR **Intervention intensity:** 3 contacts **Intervention target:** patient **Materials provided:** NA **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as at least 1 visit to CR
Notes	**Sponsorship source:** Fonds de la Recherche en Sante du Quebec (FRSQ), the Quebec Inter-university Nursing Intervention Research Group (GRIISIQ), and the Montreal Heart Institute Foundation and Research Center. CR was free of charge. Enrolment at surrounding rehabilitation facilities was not ascertained

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation was carried out in advance by a statistician at the co-ordinating centre

Cossette 2012 *(Continued)*

Allocation concealment (selection bias)	Low risk	Study nurses were provided with sealed opaque envelopes that they opened after each participant had completed the baseline questionnaire
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Enrolment in CR was assessed by database as well as by independent data entry performed by the co-ordinating centre
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for exclusion and withdrawal were reported
Selective reporting (reporting bias)	High risk	Study was registered as ISRCTN95784143. Study authors listed health services utilisation as a secondary outcome in the trial registry, above the primary outcome of enrolment that was reported. However no other health services utilisation outcome was reported in the paper
Other bias	High risk	Control group had more men and higher rates of obesity and physical inactivity. The intervention arm included more people with hypertension

Dolansky 2011

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** NR
Participants	**Inclusion criteria:** adults 65 years of age or older admitted to a nursing facility or receiving home health care following hospitalisation for a cardiac event **Exclusion criteria:** NR **N randomised:** total: 40 (subgroup not specified) **N lost to follow-up:** 2 **N analysed:** total: 38; intervention: 17; comparator: 21 **Age (mean ± SD):** intervention: 77.6 ± 6.9; comparator: 76.5 ± 6.7 **Sex (% women):** intervention: 52.9%; comparator: 71.4% **Race/ethnicity (% white):** intervention: 52.9%; comparator: 61.9%
Interventions	**Intervention:** the Cardiac TRUST programme, which consisted of cardiac self-management instruction and exercise monitoring during the immediate post-acute care period. The educational component consisted of 2 × 30-minute family sessions to identify values/goals, develop problem-solving and decision-making skills, and establish healthcare partnerships. The action component consisted of monitoring the cardiac response to physical therapy. A prescription for distance to walk was provided and was progressively increased each day. Participants were taught to rate their exertion and keep an exercise log. Family members were encouraged to participate in walking sessions **Comparison:** all participants received usual post-acute care services that included daily sessions of physical and occupational therapy, as well as discharge instructions on physical activity, medications, and follow-up **Theoretical basis:** self-management framework **Intervention provider:** nurse **Mode of delivery:** face-to-face

Dolansky 2011 *(Continued)*

	Time of delivery: pre-CR **Intervention intensity:** 2 contacts **Intervention target:** patient and family **Materials provided:** NA **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as outpatient CR attendance at 6 weeks post discharge
Notes	**Sponsorship source:** award number P30NR010676 from the National Institute of Nursing Research Each participants was given USD20 for participation in the study. Nine participants with missing data were excluded from analysis

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random numbers table was used
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	High risk	Satisfaction was reported for the intervention arm but not for the control arm
Other bias	Unclear risk	Groups were comparable across major prognostic factors, but more participants in the usual care arm were caregivers, lived with others, and were African American

Farias-Godoy 2013

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Date patients recruited:** May 2006 to May 2010
Participants	**Inclusion criteria:** men and women with risk factors for IHD (primary prevention) or documented IHD (secondary prevention) accepted into CR; secondary prevention patients classified as low or moderate risk according to AACVPR risk stratification criteria **Exclusion criteria:** presence of poorly controlled metabolic risk factors; scheduled revascularisation procedures; unlikely to survive due to non-cardiac causes; psychiatric diagnosis that would interfere with compliance; congenital heart disease with no IHD risk factors

Farias-Godoy 2013 *(Continued)*

	N randomised: total: 121; intervention: 61; comparator: 60 **N lost to follow-up:** total: 19; intervention: 11; comparator: 8 **N analysed:** total: 102; intervention: 50; comparator: 52 **Age (mean ± SD):** intervention: 61.6 ± 10.5; comparator: 60.6 ± 10.7 **Sex (% women):** intervention: 18.0%; comparator: 20.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** reduced (i.e. shorter) CR programme. The programme was designed to include the core elements of standard CR, with fewer hospital-based exercise sessions (10 sessions). The first 2 weeks was the same for both groups (a total of 2 in-hospital exercise sessions/week), and during this time, participants were able to learn exercise routines and were evaluated by staff **Comparison:** hospital-based CR over 4 months (32 sessions) **Theoretical basis:** transtheoretical model of change and motivational interviewing **Intervention provider:** experimenter **Mode of delivery:** not face-to-face **Time of delivery:** during CR **Intervention intensity:** NR **Intervention target:** patient **Materials provided:** logbook and an educational package with weekly topics **Tailoring:** NR **CR setting:** hybrid
Outcomes	Adherence - defined as per cent attendance at prescribed sessions
Notes	**Sponsorship source:** NR If, during this period, staff considered the participant more suitable for the standard CR programme for safety reasons, or if the participant decided that he/she preferred to be in the standard CR programme, an exit strategy was applied. A total of 4 participants who were randomised to the reduced CR programme used the exit strategy

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "participants were stratified by gender and randomised using a computer-generated block randomisation (blocks of four, six and eight). Randomization by this procedure ensured that at the end of each block, an equal number of participants were assigned to each group. This block list was incorporated into a telephone randomisation system"
Allocation concealment (selection bias)	Low risk	Quote: "participants were advised that due to the randomisation process, they would not know which group they would be assigned to prior to giving consent; therefore, if one or both groups of the study were unacceptable to them for any reason, they were advised not participate"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Quote: "Exercise capacity and IHD risk factors were measured by technicians who were blinded to group randomisation. Although the study manager and

Farias-Godoy 2013 *(Continued)*

		participants were aware of group assignments, the primary and many secondary outcomes were measured by blinded third parties"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	Low risk	The dissertation is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Focht 2004

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** NR
Participants	**Inclusion criteria:** older adults between 50 and 80 years of age; documented MI, PCI, chronic stable angina, stable HF, or cardiovascular surgery (coronary artery or valvular heart disease) in the past 6 months; self-reported disability and not actively engaging in exercise or CR for preceding 6 months **Exclusion criteria:** psychiatric illness (major depression within past 5 years); severe symptomatic heart disease (unstable angina, unstable HF, or exercise-induced complex ventricular arrhythmias); severe systemic disease; active treatment for cancer; hearing or sight impairment; alcoholism; inability to speak or read English; judgement of clinical staff; current participation in another medical intervention study **N randomised:** total: 147; intervention: 73; comparator: 74 **N lost to follow-up:** total: 5; intervention: 5; comparator: 0 **N analysed:** total: 142; intervention: 68; comparator: 74 **Age (mean ± SD):** intervention: 64.7 ± 7.2; comparator: 64.9 ± 6.8 **Sex (% women):** intervention: 45.2%; comparator: 50.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** group-delivered cognitive–behavioural physical activity programme, designed to gradually wean participants from dependency on the CR staff and group programme toward independent self-regulation of physical activity. For the first and second months, participants engaged in centre-based CR 2 times each week. During the third month, centre-based training was reduced to 1 time per week. In each of these months, self-planned home-based activity by participants provided additional sessions of exercise for a frequency equivalent to control treatment. Following each exercise therapy session, participants engaged in a 20- to 25-minute period of instruction and discussion regarding learning and using self-regulatory tools to maintain long-term physical activity **Comparison:** participants received 3 months of centre-based CR 3 days/week. In addition to exercise therapy, weekly educational lectures were given on topics that related to modification of risk factors for cardiovascular disease **Theoretical basis:** social-cognitive theory **Intervention provider:** certified exercise leaders **Mode of delivery:** face-to-face

Focht 2004 *(Continued)*

	Time of delivery: during CR **Intervention intensity:** 3 contacts **Intervention target:** patient **Materials provided:** NA **Tailoring:** NR **CR setting:** hybrid
Outcomes	Adherence - defined as percentage of the total number of sessions attended during the first 3 months of the trial Completion - defined as the number completing the CR programme and follow-up assessment
Notes	**Sponsorship source:** grants from the National Institutes for Aging AG14131 and 5P60 AG10484, and General Clinical Research Center Grant M01–RR007122

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"a randomized block design was used with stratification by gender"
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". The method of concealment was not described
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	Low risk	All relevant outcomes described in the methods were reported
Other bias	Low risk	The study appears to be free of other sources of bias

Grace 2016

Methods	**Study design:** RCT parallel - 3 arms **Country:** Canada **Date patients recruited:** November 2009 to July 2013
Participants	**Inclusion criteria:** women residing in proximity to CR programmes; proficiency in the English language; written approval to participate in CR provided by the patient's cardiac specialist or general practitioner (in the case of inpatient recruitment); eligibility for home-based CR (i.e. low to moderate risk as demonstrated by (1) lack of complex ventricular dysrhythmia, (2) NYHA class of 1 or 2 and left ventricular ejection fraction (LVEF) > 40%, or (3) CCS class 1 or 2) **Exclusion criteria:** musculoskeletal, neuromuscular, visual, cognitive, or non-dysphoric psychiatric condition; any serious or terminal illness not otherwise specified that would preclude CR eligibility

Grace 2016 *(Continued)*

	based on CR guidelines; physician deemed patient not suitable for CR at time of intake exercise stress test (i.e. < 3 minutes completed on Bruce protocol treadmill stress test, or < 6 minutes on modified Bruce protocol treadmill stress test, or workload < 300 kpm on a cycle ergometer test, or significant ST segment depression, uncontrolled dysrhythmias, abnormal heart rate or blood pressure measurements in response to exercise); planning to leave the area before the anticipated end of the study; being discharged to a long-term care facility; previous participation in CR; participation in another clinical trial with behavioural interventions; in the case of inpatient recruitment, having been referred to a CR programme by their healthcare provider before study randomisation was completed **N randomised:** total: 169; women-only CR: 55; home-based CR: 55; traditional mixed-sex CR: 59 **N lost to follow-up:** total: 101; women-only CR: 34; home-based CR: 37; traditional mixed-sex CR: 30 **N analysed:** total: 58; women-only CR: 21; home-based CR: 18; traditional mixed-sex CR: 19 **Age (mean ± SD):** women-only: 66.2 ± 10.2; home-based: 63.1 ± 10.9; mixed-sex comparator: 61.5 ± 9.7 **Sex (% women):** women-only: 100.0%; home-based: 100.0%; comparator: 100.0% **Race/ethnicity (% white):** women-only: 59.1%; home-based: 65.3%; comparator: 62.7%
Interventions	**Intervention:** women-only or home-based CR **Comparison:** traditional hospital-based mixed-sex CR. The only differences between site-based programme models were sex composition and some educational session content **Theoretical basis:** NA **Intervention provider:** NA **Mode of delivery:** not face-to-face **Time of delivery:** during CR **Intervention intensity:** NA **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** women-only: supervised; home-based: unsupervised; comparator: supervised
Outcomes	Enrolment - defined as patient attendance at first CR programme visit Adherence - defined as percentage of prescribed sessions attended Completion - defined as attended at least some of the CR intervention components and underwent formal re-assessment by the CR team at the conclusion of the CR intervention
Notes	**Sponsorship source:** funded by the Heart and Stroke Foundation of Ontario (Grant in Aid no. NA 6682) CR4HER trial

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "The randomisation sequence was computer- generated, in blocks of 6, and stratified by condition (myocardial infarction/percutaneous coronary intervention or coronary artery disease/coronary artery bypass graft and/or valve surgery) through randomize.net"

Grace 2016 *(Continued)*

Allocation concealment (selection bias)	Low risk	Quote: "allocation concealed"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Quote: "A masked research assistant then extracted these data from the CR program charts to calculate adherence"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for attrition and loss to follow-up were reported
Selective reporting (reporting bias)	Low risk	Grant proposal was secured from primary author, and all 3 outcomes were provided for this review
Other bias	High risk	Some participants switched treatment groups, and this may have introduced bias

Hwang 2017

Methods	**Study design:** RCT parallel - 2 arms **Country:** Australia **Date patients recruited:** July 2013 to February 2016
Participants	**Inclusion criteria:** HF, over 18 years of age **Exclusion criteria:** did not meet safety screening criteria as outlined by the Australian exercise guidelines for patients with chronic HF, such as symptomatic severe aortic stenosis and significant ischaemia at low exercise intensity; lived in an institution such as a nursing home; lived more than an hour driving distance from the treating hospital; had no support person at home **N randomised:** total: 53; intervention: 24; comparator: 29 **N lost to follow-up:** total: 4; intervention: 1; comparator: 3 (6 months' follow-up) **N analysed:** total: 102; intervention: 23; comparator: 26 **Age (mean ± SD):** intervention: 68.0 ± 14.0; comparator: 67.0 ± 11.0 **Sex (% women):** intervention: 20.8%; comparator: 27.5% **Race/ethnicity (% white):** intervention: 92%; comparator: 93%
Interventions	**Intervention:** short-term, real-time, group-based HF rehabilitation programme delivered at each participant's home via an online telerehabilitation system. The programme was delivered via a synchronous videoconferencing platform across the Internet to groups of up to 4 participants within the home. Two-way audiovisual communication enabled interaction of all parties, and the physiotherapist guided participants through an exercise programme similar to the control. This approach enabled the physiotherapist to watch participants performing the exercises and to provide real-time feedback and modification, as required, as well as to facilitate peer support from other participants. Participants were provided with additional home exercises similar to those in the control group. Participants were encouraged to watch the designated presentation individually or with their support person, in their own time, in preparation for subsequent online group discussions. A 15-minute interaction period was held at the start of each telerehabilitation session to facilitate these discussions **Comparison:** the control group received a centre-based rehabilitation programme based on current recommended guidelines encompassing education, aerobics, and strength training exercise. This traditional HF rehabilitation programme was led by physiotherapists over a 12-week period; it consisted of 60 minutes of exercise per session, 2 sessions per week, at the treating hospital. Each session consisted of a 10-minute warm-up, 40 minutes of aerobic and strength exercises, and a 10-minute cool-down. Ex-

Hwang 2017 *(Continued)*

	ercise prescription was tailored to the participant's goal, and the treating physiotherapist continuously reviewed it to ensure appropriate progression. The control group attended educational sessions at the hospital on the same day as the exercise sessions **Theoretical basis:** NR **Intervention provide**r: NA **Mode of delivery:** not face-to-face **Time of delivery:** during CR **Intervention intensity:** NA **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** unsupervised
Outcomes	Adherence - defined on basis of the proportion of prescribed sessions attended (in person or online)
Notes	**Sponsorship source:** supported by the Princess Alexandra Hospital Research Support Scheme Small Grant 2013; the Prince Charles Hospital Foundation Novice

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Quote: "patients were allocated 1:1 using a non-blocked random allocation sequence" Information regarding sequence generation was insufficient to permit judgement of risk
Allocation concealment (selection bias)	Low risk	Quote: "Allocation was concealed through the use of opaque, sealed and numbered envelopes, and administered by an experienced, independent researcher at a central location"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Quote: "blinded outcome assessors"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for exclusion and losses to follow-up were reported
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol is not available to identify unreported outcomes
Other bias	Low risk	The study appears to be free of other sources of bias

Jolly 1999

Methods	**Study design:** RCT cluster **Country:** UK

Jolly 1999 *(Continued)*

	Date patients recruited: NR
Participants	**Inclusion criteria:** patients admitted to hospital with MI or with angina of recent onset seen in hospital from 1 of 67 general practices in a specified geographical area; patients judged well enough to participate by medical and nursing staff on the ward or in the clinic **Exclusion criteria:** NR **N randomised:** total: 597; intervention: 277; comparator: 320 **N lost to follow-up:** total: 38; intervention: 15; comparator: 23 (12 months' follow-up) **N analysed:** total: 559; intervention: 262; comparator: 297 **Age (mean ± SD):** intervention: 63.0 ± 10.0; comparator: 64.0 ± 10.0 **Sex (% women):** intervention: 32.0%; comparator: 26.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** specialist cardiac liaison nurses co-ordinated the transfer of participant care between hospital and general practice. The liaison nurse saw participants in hospital and encouraged them to see a practice nurse after discharge. Each participant was given a patient-held record card that prompted and guided follow-up at standard intervals. Support was provided to practice nurses by regular contact, including a telephone call shortly before participant discharge to discuss care and book at first follow-up visit to the practice. Practice nurses were encouraged to telephone the liaison nurse to discuss problems or to seek advice on clinical and organisational issues **Comparison:** usual care without care co-ordination **Theoretical basis:** NR **Intervention provider:** nurse **Mode of delivery:** face-to-face **Time of delivery:** pre-CR **Intervention intensity:** 1 **Intervention target:** nurse **Materials provided:** NA **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as attendance at at least 1 CR session
Notes	**Sponsorship source:** funded by a research and development national programme grant from the NHS Executive, with service support from Southampton and South West Hampshire Health Authority

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

Jolly 1999 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Low risk	Follow-up of participants carried out by a nurse not responsible for delivering the intervention to the participant's practice
Incomplete outcome data (attrition bias) All outcomes	Low risk	10% of participants lost to follow-up; similar rates for intervention arm and control arm
Selective reporting (reporting bias)	Low risk	The protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Kraal 2014

Methods	**Study design:** RCT parallel - 2 arms **Country:** the Netherlands **Date patients recruited:** March 2013 to March 2014
Participants	**Inclusion criteria:** patients who entered CR after hospitalisation for MI, unstable angina, or a revascularisation procedure (PCI or CABG); low to moderate risk of future cardiac events according to the Dutch CR guidelines **Exclusion criteria:** NR **N randomised:** total: 55; intervention: 29; comparator: 26 **N lost to follow-up:** total: 5; intervention: 4; comparator: 1 **N analysed:** total: 50; intervention: 25; comparator: 25 **Age (mean ± SD):** intervention: 60.6 ± 7.5; comparator: 56.1 ± 8.7 **Sex (% women):** intervention: 12.0%; comparator: 16.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** the FIT@HOME intervention combined motivational interviewing in the initial CR phase with ongoing objective feedback on training progression. After 3 supervised training sessions in the outpatient clinic, participants started training in their home environment. The coach remotely supervised the training sessions performed at home and offered appropriate support via telephone using a semi-structured interview **Comparison:** group-based training sessions on a treadmill or cycle ergometer, supervised by physical therapists and exercise specialists. The programme lasted for 12 weeks, with at least 2 training sessions per week. Participants were instructed to exercise for 45 to 60 minutes per session at 70% to 85% of their maximal heart rate **Theoretical basis:** behavioural change (goal-setting and motivational interviewing) **Intervention provider:** NA **Mode of delivery:** not face-to-face **Time of delivery:** during CR **Intervention intensity:** NA

Kraal 2014 *(Continued)*

	Intervention target: patient **Materials provided:** NR **Tailoring:** NR **CR setting:** hybrid
Outcomes	Adherence - defined as percentage of prescribed sessions completed
Notes	**Sponsorship source:** funded by ZonMw, the Dutch Organisation for Health Research and Development (project number 837001003)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation was based on randomisation with variable block size (2 or 4) performed with dedicated computer software by a researcher who was not present at the time of allocation
Allocation concealment (selection bias)	Low risk	To conceal allocation, numbered and sealed opaque envelopes were opened between the baseline cardiopulmonary exercise test and the start of exercise training
Blinding of outcome assessment (detection bias) All outcomes	Low risk	No information for the outcome of interest was provided; however the outcome measurement is not likely to be influenced by lack of blinding
Incomplete outcome data (attrition bias) All outcomes	High risk	29 and 26 participants were randomised, but the study provided data for 25 participants in each arm, suggesting missing outcome data
Selective reporting (reporting bias)	Low risk	All outcomes described in the protocol were reported - although through different publications (cost analysis was published in a different article)
Other bias	Low risk	Groups were comparable at baseline, including all major prognostic factors. The study appears to be free of other sources of bias

Lynggaard 2017

Methods	**Study design:** RCT parallel - 2 arms **Country:** the Netherlands **Date patients recruited:** November 2010 to December 2012
Participants	**Inclusion criteria:** aged 18 years and older, discharged from hospital with ischaemic heart disease or HF; assigned and motivated for CR **Exclusion criteria:** acute coronary syndrome less than 5 days before randomisation; active peri-, myo-, or endocarditis; symptomatic and untreated valve disease; severe hypertension with blood pressure > 200/110 mmHg; other severe cardiac or extracardiac disease; planned revascularisation; senile dementia; assessed as having low compliance; former participation in the study **N randomised:** total: 825; intervention: 413; comparator: 412 **N lost to follow-up:** total: 8; intervention: 4; comparator: 4

Lynggaard 2017 *(Continued)*

	N analysed: total: 825; intervention: 413; comparator: 412 **Age (mean ± SD):** intervention: 63.0 ± 10.0; comparator: 63.0 ± 11.0 **Sex (% women):** intervention: 24.0%; comparator: 24.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** based on learning and coping strategies. The intervention group received individual clarifying interviews before and after the CR programmes. Participants had an initial interview to help clarify their needs before CR and to prepare them to learn how to cope with living with a chronic heart disease. In the finishing interview, the patient and the health professional in partnership clarified what benefits the patient had derived from CR and discussed future strategies for coping with their chronic heart disease. Narratives told by experienced patients were used as good learning examples **Comparison:** the control group received group-based CR lasting 8 weeks, with exercise training sessions 3 times a week and education once a week **Theoretical basis:** learning and coping - Illness perception, use of narratives, appreciative approach **Intervention provider:** nurse, physiotherapist, and experienced former CR patients (co-educators and narrators). Each week, a 1-hour evaluation meeting was held by the nurse, the physiotherapist, and the experienced patient assigned to each specific class **Mode of delivery:** face-to-face **Time of delivery:** pre-CR and post-CR **Intervention intensity:** 2 **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** supervised
Outcomes	Adherence - defined as percentage of prescribed sessions completed
Notes	**Sponsorship source:** funded by the Danish Ministry of Health (54804/22), the Health Research Fund of Central Denmark Region, and the Danish Foundation

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "blocks of two to four using a web-based system that was implemented independently of the research team"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Quote: "it was not possible to blind patients or health professionals. However, as the primary adherence outcomes were assessed objectively, it is unlikely to be subject to patient reporting bias"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for exclusion and losses to follow-up were reported; intention-to-treat analysis was performed

Lynggaard 2017 *(Continued)*

Selective reporting (reporting bias)	Low risk	The protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

McGrady 2014

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** NR
Participants	**Inclusion criteria:** patients admitted to Phase II of the CR after MI, CABG surgery, stable angina, chronic heart failure (CHF, NYHA class I or II), or other procedure (stent placement, valve replacements, aortic aneurism repair, atrial fibrillation, and heart transplant) **Exclusion criteria:** NR **N randomised:** total: 304; intervention: 136; comparator: 168 **N lost to follow-up:** NR **N analysed:** total: 304; intervention: 136; comparator: 168 **Age (mean ± SD):** intervention: 60.3 ± 11.7; comparator: 62.8 ± 13.1 **Sex (% women):** intervention: 34.0%; comparator: NR **Race/ethnicity (% white):** NR
Interventions	**Intervention:** the intervention consisted of four 30-minute sessions conducted during the first weeks of CR. Participants participated in groups of 2 to 6. Sessions rotated so that a participant could begin at any time in the 4 sessions. Each session consisted of about 15 minutes of motivational interviewing and about 15 minutes of relaxation. The motivational interviewing portions focused on participants' personal goals, fostering an optimistic view of the benefits of rehabilitation, decreasing negative self-talk, and overcoming barriers to completing the exercise programme. The relaxation portion comprised mindful breathing, progressive relaxation, and simple imagery **Comparison:** the historical control group received group-based CR lasting 12 weeks, with exercise training sessions 3 times a week and education once a week **Theoretical basis:** NA **Intervention provider:** nurse, physiotherapist, and experienced former CR patients (co-educators and narrators). Each week, a 1-hour evaluation meeting was held by the nurse, the physiotherapist, and the experienced patient assigned to each specific class **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 4 **Intervention target:** patient **Materials provided:** handouts for each relaxation technique were provided to all attendees; practice was encouraged but was not formally monitored **Tailoring:** NR

McGrady 2014 *(Continued)*

	CR setting: supervised
Outcomes	Adherence - defined as percentage of prescribed sessions completed
Notes	**Sponsorship source:** NR

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	High risk	Table 4 shows baseline scores for completers and non-completers of the intervention; however dropout reasons were not stated
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol or trial register is not available to identify unreported outcomes
Other bias	Unclear risk	Whether comparison groups were similar at baseline remains unclear

McPaul 2007

Methods	**Study design:** RCT parallel - 2 arms **Country:** United Kingdom **Date patients recruited:** December 2006 to June 2007
Participants	**Inclusion criteria:** non-ST elevation MI **Exclusion criteria:** patients considered mentally unable to complete a questionnaire (e.g. due to dementia or mental handicap) or considered too ill to be asked to participate; those living too far away to be visited at home; those with a known history of violence because they may have been a threat to the researcher visiting them at home; prisoners due to their lack of freedom to decide for themselves whether or not to attend; those who died, were discharged, or were transferred to another hospital **N randomised:** total: 25; intervention: 15; comparator: 10 **N lost to follow-up:** total: 4; intervention: 3; comparator: 1 **N analysed:** total: 21; intervention: 12; comparator: 9 **Age (mean ± SD):** overall: 67.2 ± 13.9 **Sex (% women):** overall: 16.0% **Race/ethnicity (% white):** NR

McPaul 2007 *(Continued)*

Interventions	**Intervention:** a home visit by the researcher to the participant (and relative if required) with a semi-structured discussion format used during the visit. The visit started with a general discussion about the participant's physical and mental health since hospital discharge. Counselling was provided about appropriate level of physical activity, medications, diet, and smoking cessation. The researcher invited the participant to attend and encouraged participation in CR **Comparison:** a telephone call using the same semi-structured interview format; participants were invited to attend CR and were invited to attend a pre-CR clinic **Theoretical basis:** NR **Intervention provider:** allied healthcare provider (occupational therapist) **Mode of delivery:** face-to-face **Time of delivery:** pre-CR **Intervention intensity:** 1 **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** supervised
Outcomes	Enrolment - defined as attendance at CR
Notes	**Sponsorship source:** funded by Epsom and St Helier NHS Trust All control participants who attended the pre-CR clinic attended CR later

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Envelopes allocating to intervention or treatment were randomly arranged by the researcher
Allocation concealment (selection bias)	Low risk	Sealed envelopes were used
Blinding of outcome assessment (detection bias) All outcomes	High risk	Study personnel were not blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	4 participants were lost to follow-up and excluded from analysis. Analyses were based on the 21 participants who completed the study. ITT analyses were not performed
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol is not available to identify unreported outcomes
Other bias	Unclear risk	No significant differences were noted in baseline measurements of anxiety and depression, but information on major cardiovascular risk factors was not collected

Mosleh 2014

Methods	**Study design:** RCT parallel - 4 arms **Country:** Israel **Date patients recruited:** January 2007 to December 2007
Participants	**Inclusion criteria:** patients admitted with MI, CABG, or PCI and referred to hospital-based CR programme or to 1 of the 3 community CR programmes **Exclusion criteria:** terminal illness, arrhythmia, alcohol or drug abuse, mental or physical disability **N randomised:** total: 375; intervention 1 (theory-based letter): 96; intervention 2 (standard letter + leaflet): 92; intervention 3 (theory-based letter + leaflet): 91; comparator (standard letter): 96 **N lost to follow-up:** none **N analysed:** total: 375; intervention 1 (theory-based letter): 96; intervention 2 (standard letter + leaflet): 92; intervention 3 (theory-based letter + leaflet): 91; comparator (standard letter): 96 **Age (mean ± SD):** intervention 1: 60.3 ± 12.5; intervention 2: 63.4 ± 10.3; intervention 3: 63.2 ± 11.3; comparator: 63.0 ± 10.3 **Sex (% women):** intervention 1: 29.1%; intervention 2: 33.5%; intervention 3: 32.6%; comparator: 33.3% **Race/ethnicity (% white):** NR
Interventions	**Interventions:** 2 postal interventions to increase attendance at CR. An invitation letter and a supportive leaflet were both developed in accordance with theories. The CR programme secretary posted the standard letter or the new letter, with or without the supplementary leaflet (according to group allocation), to the participant's home address 2 weeks before the participant was due to attend outpatient CR. The leaflet included instructions that it should be read the day before the participant's first appointment **Comparator:** received a standard letter of invitation to attend CR; as per usual practice, participants in all groups received a telephone call to encourage attendance **Theoretical basis:** theory of planned behaviour and commonsense model of illness **Intervention provider:** not a healthcare provider or nurse **Mode of delivery:** mail **Time of delivery:** pre-CR **Intervention intensity:** 1 or 2 **Intervention target:** patient **Materials provided:** letter and leaflet about the benefits of CR **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as patient attendance at 1 or more biweekly sessions
Notes	**Sponsorship source:** no specific grant from any funding agency in the public, commercial, or not-for-profit sector

Risk of bias

Bias	Authors' judgement	Support for judgement

Mosleh 2014 *(Continued)*

Random sequence generation (selection bias)	Low risk	Quote: "An independent statistician randomly allocated a list of ID numbers into four groups and provided this to the CR secretary, who posted the appropriate invitation letter plus or minus the leaflet according to the allocation"
Allocation concealment (selection bias)	Low risk	Quote: "Details of which participants were allocated to which groups were released to the researcher and the researcher's advisors after all participants had completed the eight-week outpatient CR program and data collection was complete. In addition, the CR secretary kept the allocation schedule secure from the other CR staff in a computerized locked file"
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Quote: "The researchers were kept blind to group allocation"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	Low risk	The protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias; groups were comparable at baseline

Oldridge 1983

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Date patients recruited:** NR
Participants	**Inclusion criteria:** all male patients admitted with a documented diagnosis of coronary heart disease (MI, CABG, and angina) and referred to CR **Exclusion criteria:** NR **N randomised:** total: 120; intervention: 63; comparator: 57 **N lost to follow-up:** none **N analysed:** total: 120; intervention: 63; comparator: 57 **Age (mean ± SD):** overall: 51.5 ± 8.7 **Sex (% women):** 0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** usual comprehensive CR programme plus self-management techniques, including an agreement to participate in the programme for 6 months to be signed by the participant and the co-ordinator, and self-report diaries to be completed and discussed with the co-ordinator at regular intervals. Diaries included 6 graphs for plotting self-monitored submaximal heart rates each month, at 33%, 50%, and 75% of the maximum power output achieved in the previous exercise test, and 6 × 24-hour recall questionnaires of daily activities on a randomly chosen day to be completed each month. In addition, a weight loss diary to be filled in each week was given to participants who initially agreed to lose weight, and similar diaries were used to record the number of cigarettes smoked each day (as applicable). Follow-up was provided at the end of the intervention period of 6 months

Oldridge 1983 *(Continued)*

	Comparison: usual comprehensive CR programme **Theoretical basis:** self-management **Intervention provider:** physician and exercise leaders **Mode of delivery:** face-to-face **Time of delivery:** during CR **Intervention intensity:** 1 **Intervention target:** patient **Materials provided:** contract, diaries, logs **Tailoring:** NR **CR setting:** supervised
Outcomes	Completion - defined as percentage of those who attended 60% or more of the 48 scheduled supervised CR sessions
Notes	**Sponsorship source:** Health and Welfare, Canada, National Health Research and Development Program, grant 6606-1586-44 Participants were stratified by smoking status, occupation, leisure habits, and number of prior infarctions before randomisation. These variables were shown to be predictors of dropout

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number list was used
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Attendance of dropouts was similar in intervention and control groups (21% with intervention vs 16% with control) and was also similar for compliers (74% with intervention vs 76% with control). Not all participants in the intervention group signed the agreement to participate. Compliance was significantly higher among the 48 people who signed (65%) than in the 15 who refused to sign (20%)
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol is not available to identify unreported outcomes
Other bias	Unclear risk	Whether comparison groups were similar at baseline remains unclear

Pack 2013

Methods	**Study design:** RCT parallel - 2 arms

Pack 2013 *(Continued)*

	Country: USA **Date patients recruited:** February 2011 to November 2011
Participants	**Inclusion criteria:** patients > 18 years of age with a qualifying diagnosis for referral to CR (MI, PCI, or angina with an ischaemic stress ECG, stress echocardiogram, or stress myocardial perfusion imaging study) **Exclusion criteria:** patients who had undergone recent CABG, valve surgery, or cardiac transplantation **N randomised:** total: 150; intervention: 76; comparator: 74 **N lost to follow-up:** total: 2; intervention: 2; comparator: 0 **N analysed:** total: 148; intervention: 74; comparator: 74 (for attendance) **Age (mean ± SD):** intervention: 61.0 ± 12.0; comparator: 59.0 ± 12.0 **Sex (% women):** intervention: 39.2%; comparator: 50.0% **Race/ethnicity (% white):** intervention: 45.0%; comparator: 42.0%
Interventions	**Intervention:** early appointment for orientation class for CR (within 10 days) **Comparison:** participants randomised to standard care were scheduled for an orientation appointment within 35 days from the index event **Theoretical basis:** NR **Intervention provider:** NA **Mode of delivery:** not face-to-face **Time of delivery:** pre-CR **Intervention intensity:** NR **Intervention target:** patient **Materials provided:** NA **Tailoring:** NR **CR setting:** supervised
Outcomes	Enrolment - defined as attendance at orientation class for CR Adherence - defined as total number of exercise sessions attended Completion - defined as completion of CR
Notes	**Sponsorship source:** funding for statistical analysis came from the Department of Graduate Medical Education at Henry Ford Hospital Study was terminated early due to relocation of the trial principal investigator. An unplanned interim analysis revealed a statistically significant difference in attendance rate for CR, so recruitment was terminated early

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence generation was created via a computerised random number generator

Pack 2013 *(Continued)*

Allocation concealment (selection bias)	Low risk	Allocation cards were kept in opaque sequential sealed envelopes until the time of participant randomisation
Blinding of outcome assessment (detection bias) All outcomes	High risk	CR staff recorded primary outcomes and were not blinded to treatment allocation
Incomplete outcome data (attrition bias) All outcomes	Low risk	2 participants in the intervention group withdrew consent and were excluded; they were treated as non-attenders in analyses; ITT analysis was performed
Selective reporting (reporting bias)	Low risk	All relevant outcomes described in the methods were reported
Other bias	Unclear risk	Trial was terminated early due to unplanned interim analysis

Parry 2009

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Dates patients recruited:** February 2006 to February 2007
Participants	**Inclusion criteria:** men and women having first-time non-emergency CABG surgery, ready for discharge home, and able to communicate via telephone **Exclusion criteria:** NR **N randomised:** total: 101; intervention: 49; comparator: 52 **N lost to follow-up:** total: 7; intervention: 5; comparator: 2 **N analysed:** total: 95; intervention: 45; comparator: 50 **Age (mean ± SD):** intervention: 62.0 ± 11.0; comparator: 64.0 ± 10.0 **Sex (% women):** intervention: 16.3%; comparator: 17.3% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** participants received peer-generated telephone calls for 8 weeks following hospital discharge. Telephone calls focussed on pain management, exercise, and encouragement to enroll in a CR programme. Dose and frequency of calls were determined by peer-patient dyad, and most telephone calls were peer-initiated **Comparison:** usual care consisted of standard preoperative and postoperative education and visits from in-hospital peer volunteers **Theoretical basis:** NR **Intervention provider:** peer volunteers included men and women who had undergone CABG surgery within the previous 5 years and had attended a CR programme. Peer volunteers attended a 4-hour training session to develop skills required for effective telephone support. Peer volunteers received a training manual intended to guide the training sessions and the intervention **Mode of delivery:** not face-to-face **Time of delivery:** pre-CR **Intervention intensity:** 12

Parry 2009 *(Continued)*

	Intervention target: patient **Materials provided:** NR **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined as attendance at at least 1 session
Notes	**Sponsorship source:** Heart and Stroke Foundation of Canada, Canadian Institutes of Health Research FUTURE Program for Cardiovascular Nurse Scientists, Cardiac Science Medtronic Research Grant/ Kingston General Hospital, Canadian Council of Cardiovascular Nurses Research Grant, Nurse Practitioner Association of Ontario Cardiovascular Acute Care Nurse Practitioner Pfizer Award, and a Canadian Pain Society Nursing Research Award A wide range in the number of contacts, as well as in time per contact, was evident. Only 17 (18%) participants attended CR at 9 weeks post surgery

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random assignment was centrally controlled by an Internet-based randomisation service, with stratification based on sex and variable block sizes of 4 and 8
Allocation concealment (selection bias)	Low risk	Centralised randomisation was performed
Blinding of outcome assessment (detection bias) All outcomes	Low risk	Outcome data were collected via telephone interview by a research assistant blinded to group allocation
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	6 dropouts were balanced between intervention and control arms. Unclear whether ITT analysis was performed. Text refers to "intention to treat analyses", but figure suggests that excluded participants were not included in the analyses
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol is not available to identify unreported outcomes
Other bias	Low risk	The study appears to be free of other sources of bias

Pfaeffli Dale 2015

Methods	**Study design:** RCT parallel - 2 arms **Country:** New Zealand **Date patients recruited:** recruited over 10 months between 2013 and 2014
Participants	**Inclusion criteria:** English-speaking adults with a documented diagnosis of CHD (MI, angina, or revascularisation). Although participants were not required to have computer or Internet literacy, access to the Internet (e.g. at home, work, or library) was a requirement. Participants need not own a mobile phone with text messaging capability because phones were supplied for the duration of the study if necessary

Pfaeffli Dale 2015 *(Continued)*

	Exclusion criteria: those with untreated ventricular tachycardia, severe HF, life-threatening coexisting disease with life expectancy less than 1 year, and/or significant exercise limitations for reasons other than CHD **N randomised:** total: 123; intervention: 61; comparator: 62 **N lost to follow-up:** none **N analysed:** total: 123; intervention: 61; comparator: 62 **Age (mean ± SD):** intervention: 59.0 ± 10.5; comparator: 59.9 ± 11.8 **Sex (% women):** intervention: 21.0%; comparator: 16.0% **Race/ethnicity (% white):** intervention: 75%; comparator: 73%
Interventions	**Intervention:** a theoretically framed comprehensive programme of evidence-based CR. The intervention group received a 24-week mHealth programme sent by automated daily text messages and access to a supporting website commencing within a week of the baseline assessment. The aim was to mirror current CR programmes in educating participants about their cardiovascular risk factors and in supporting them to make relevant lifestyle changes Additionally, they received usual care, which included inpatient rehabilitation and encouragement to attend centre-based CR. Traditional CR offered at hospital recruiting sites consisted of one 1-hour outpatient educational programme per week for 6 weeks at a hospital or community centre, covering a range of topics, including cardiovascular risk factors, lifestyle change, and psychosocial support. Participants also were encouraged to attend a 16-session supervised exercise programme at the participating hospital or outpatient centre **Comparison:** usual care group received inpatient rehabilitation and encouragement to attend centre-based CR **Theoretical basis:** social cognitive theory **Intervention provider:** NA **Mode of delivery:** not face-to-face **Time of delivery:** during CR **Intervention intensity:** 144 **Intervention target:** patient **Materials provided:** NR **Tailoring:** messages were tailored to participants' names and preferred times of day to receive messages **CR setting:** supervised
Outcomes	Enrolment - defined as having attended at least 1 session of usual care CR
Notes	**Sponsorship source:** funded in part by a Health Research Council Sir Charles Hercus Fellowship and a HOPE Selwyn Foundation Scholarship in Ageing Research

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "The randomisation sequence was computer generated by a statistician independent to the project using a block size of 6"

Pfaeffli Dale 2015 *(Continued)*

Allocation concealment (selection bias)	Low risk	Allocation was concealed in sequentially numbered, opaque, sealed envelopes
Blinding of outcome assessment (detection bias) All outcomes	High risk	Quote: "Because of the nature of the intervention, participants and outcome assessors were not blinded to their treatment allocation"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Reasons for exclusion and losses to follow-up were reported; intention-to-treat analysis was not performed
Selective reporting (reporting bias)	Low risk	The study protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Price 2012

Methods	**Study design:** RCT parallel - 2 arms **Country:** Canada **Date patients recruited:** NR
Participants	**Inclusion criteria:** female patients who were hospitalised for a cardiac diagnosis (MI, angina, HF, CABG, CABG/valve or valve surgery, or PCI); were eligible for referral to CR; were judged ready for discharge; had access to and were able to communicate over a telephone; and were able to read, write, and understand English **Exclusion criteria:** NR **N randomised:** total: 70; intervention: 34; comparator: 36 **N lost to follow-up:** total: 4; intervention: 1; comparator: 3 **N analysed:** total: 66; intervention: 33; comparator: 33 **Age (mean ± SD):** intervention: 67.0 ± 12.0; comparator: 68.0 ± 11.0 **Sex (% women):** intervention: 100.0%; comparator: 100.0% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** usual care plus an individualised personal coaching programme. The coaching programme consisted of scheduled, coach-generated telephone calls between hospital discharge and CR intake appointment to explain the benefits of CR, clarify concerns, motivate women to enrol, and overcome any individual barriers to entering a programme. Coaching emphasised problem-solving, decision-making, and confidence-building. Intervention calls were initiated within 1 to 2 weeks of hospital discharge. They were scheduled every 2 weeks, with at least 3 telephone calls completed, or the participant attended an intake appointment **Comparison:** usual care consisted of a referral to CR followed by a letter from the programme informing the participant of his or her intake appointment **Intervention provider:** nurse **Mode of delivery:** telephone call **Time of delivery:** Pre-CR

Price 2012 *(Continued)*

	Theoretical basis: social cognitive theory **Intervention intensity:** 5 contacts **Intervention target:** patient **Materials provided:** NR **Tailoring:** NR **CR setting:** supervised
Outcomes	Enrolment - defined as attendance at the initial CR appointment
Notes	**Sponsorship source:** funded by Heart and Stroke Foundation of Canada, FUTURE Program for Cardiovascular Nurse Scientists, Canadian Council of Cardiovascular Nursing Research Grant, Sunnybrook and Women's Health Science's Nursing Graduate Award, and the Jesse Young Award from Women's College Hospital and the Academic Cardiology Group at Women's College Hospital

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation was centrally controlled by a Web-based randomisation service
Allocation concealment (selection bias)	Low risk	The primary investigator and participants were unaware of the next assignment in the randomisation sequence
Blinding of outcome assessment (detection bias) All outcomes	Low risk	The research assistant, blinded to group allocation, collected all outcome data
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	4 participants were lost to follow-up, and 4 discontinued/refused to complete. Analyses were described as ITT, but participants lost to follow-up were excluded from analyses
Selective reporting (reporting bias)	Low risk	The dissertation is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	Groups were comparable at baseline, including major prognostic factors

Suskin 2007

Methods	**Study design:** RCT parallel - 2 arms **Country:** USA **Date patients recruited:** May 2003 to October 2006
Participants	**Inclusion criteria:** patients admitted for MI, unstable angina, PCI, and CABG **Exclusion criteria:** NR **N randomised:** total: 548; intervention: 275; comparator: 273 **N lost to follow-up:** NR

Suskin 2007 *(Continued)*

	N analysed: total: 548; intervention: 275; comparator: 273 **Age (mean ± SD):** NR **Sex (% women):** intervention: 31.6%; comparator: 31.1% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** participants received a strong endorsement of CR through a pre-discharge personalised letter written by the attending cardiologist (or the cardiac surgeon), encouraging participation in CR. In addition to the standard CR referral, participants were given their CR programme intake appointment dates before hospital discharge **Comparison:** participants received a standard CR referral alone **Theoretical basis:** NR **Intervention provider:** doctor **Mode of delivery:** letter **Time of delivery:** pre-CR **Intervention intensity:** 1 contact **Intervention target:** patient **Materials provided:** letter encouraging CR attendance **Tailoring:** NR **CR setting:** NR
Outcomes	Enrolment - defined by attendance at the CR programme within 4 months of index hospital discharge
Notes	**Sponsorship source:** NR Abstract only

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Allocation concealment (selection bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Reasons for withdrawal were provided
Selective reporting (reporting bias)	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk". Study protocol is not available to identify unreported outcomes
Other bias	Unclear risk	Information was insufficient to assess whether an important risk of bias exists

Varnfield 2014

Methods	**Study design:** RCT parallel - 2 arms **Country:** Australia **Date patients recruited:** May 2009 to February 2011
Participants	**Inclusion criteria:** patients admitted for MI and referred to CR **Exclusion criteria:** unable to participate in self-management programmes or to operate smartphone for purposes of trial due to medical care needs (e.g. vision, hearing, cognitive or dexterity impairment); attending CR or involved in another behavioural trial; or had no experience with mobile/smartphones **N randomised:** total: 120; intervention: 60; comparator: 60 **N lost to follow-up:** total: 48; intervention: 14; comparator: 34 **N analysed:** total: 72; intervention: 46; comparator: 26 (6-week assessment) **Age (mean ± SD):** intervention: 54.9 ± 9.6; comparator: 56.2 ± 10.1 **Sex (% women):** intervention: 31.6%; comparator: 31.1% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** the CAP-CR platform used a smartphone for health and exercise monitoring, and delivered motivational and educational materials to participants via text messages and pre-installed audio and video files (including understanding cardiovascular disease, symptoms, and management). The platform included a Web portal with participant data for mentors to provide weekly consultations **Comparison:** community centres **Theoretical basis:** NR **Intervention provider:** technology; mentors on CAP-CR **Mode of delivery:** smartphone **Time of delivery:** during CR **Intervention intensity:** NR **Intervention target:** patient **Materials provided:** smartphone with all applications necessary for the CR intervention **Tailoring:** NR **CR setting:** unsupervised
Outcomes	Enrolment - defined as attending baseline assessment and at least 1 gym exercise session for the comparison group, and upload of exercise data to the Web portal for the CAP-CR group Adherence - defined as attendance for 4 weeks (8 or more gym sessions) for the traditional CR group, or upload of 4 weeks' exercise data for the CAP-CR group Completion - defined as completion of the 6-week CR programme
Notes	**Sponsorship source:** funding provided through a Joint Venture between Australian eHealth Research Centre and Queensland Health
Risk of bias	

Varnfield 2014 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "Permuted-block randomisation, by computer-generated random numbers with variable block sizes of 4, 6 and 8"
Allocation concealment (selection bias)	Low risk	Quote: "sequentially numbered opaque, sealed envelopes, was conducted prior to baseline assessment to randomise patients to one of two parallel groups"
Blinding of outcome assessment (detection bias) All outcomes	High risk	Quote: "unblinded randomised controlled trial"
Incomplete outcome data (attrition bias) All outcomes	Low risk	Primary outcome measures of uptake and completion were analysed on an intention-to-treat basis. Adherence was assessed only among those who undertook the programme. Reasons for exclusion and losses to follow-up were reported
Selective reporting (reporting bias)	Low risk	The protocol is available, and all of the study's prespecified (primary and secondary) outcomes of interest in the review have been reported in the prespecified way
Other bias	Low risk	The study appears to be free of other sources of bias

Wyer 2001

Methods	**Study design:** RCT parallel - 2 arms **Country:** United Kingdom **Date patients recruited:** April 2000 to December 2000
Participants	**Inclusion criteria:** adult patients hospitalised for acute myocardial infarction and referred to a CR programme **Exclusion criteria:** NR **N randomised:** total: 87; intervention: 43; comparator: 44 **N lost to follow-up:** total: 19; intervention: 6; comparator: 13 **N analysed:** total: 68; intervention: 37; comparator: 31 **Age (mean):** intervention: 62.2; comparator: 63.3 **Sex (% women):** intervention: 13.9%; comparator: 11.3% **Race/ethnicity (% white):** NR
Interventions	**Intervention:** letters based on the theory of planned behaviour (Ajzen 1986) designed to increase attendance at outpatient CR clinic were given to participants 3 days post MI and were sent 3 weeks post MI. The first letter was designed to influence acceptance, and the second was designed to influence attendance. Participants also received a nominal letter of thanks at 3 days, and the standard letter detailing course dates was sent to control participants. After allocation to groups, the cardiac rehabilitation nurse saw all participants for routine assessment and personal invitation to the programme. For participants who declined the offer of a place, a brief second letter was sent to wish them well and to inform them that they were still welcome to contact the team **Comparison:** nominal letter of thanks given to participants at 3 days post MI along with the standard letter detailing course dates

Wyer 2001 *(Continued)*

	Theoretical basis: theory of planned behaviour **Intervention provider:** NA **Mode of delivery:** letter **Time of delivery:** pre-CR **Intervention intensity:** 2 contacts **Intervention target:** patient **Materials provided:** letters to increase attendance **Tailoring:** NR **CR setting:** unsupervised
Outcomes	Enrolment - defined as attendance at the outpatient CR programme
Notes	**Sponsorship source:** NR Women were less likely to attend the programme, but neither age nor distance lived from the programme predicted attendance. Study authors noted that the intervention may have worked by acting as a fear message, rather than through implementation of the theory of planned behaviour

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Allocation was done by random number assignment
Allocation concealment (selection bias)	Low risk	Participants were handed a sealed numbered envelope with a nominal letter. Half of the envelopes also contained an intervention letter. Envelope contents were known to a research assistant only
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	Information was insufficient to permit judgement of "low risk" or "high risk"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	13 participants were excluded but were not told treatment allocation
Selective reporting (reporting bias)	Low risk	Information was insufficient to permit judgement of "low risk" or "high risk". The study protocol is not available to identify unreported outcomes
Other bias	High risk	CR nurse was not aware of group assignments; however, no procedure was in place to stop participants from telling the nurse which letter they received

AACVPR: American Association of Cardiovascular and Pulmonary Rehabilitation; ACS: acute coronary syndrome; CABG: coronary artery bypass graft; CAP-CR: Care Assessment Platform-Cardiac Rehabilitation; CCS: Canadian Cardiovascular Society; CHD: coronary heart disease; CR: cardiac rehabilitation; ECG: electrocardiogram; HF: heart failure; IHD: ischaemic heart disease; ITT: intention-to-treat; LVEF: left ventricular ejection fraction; MI: motivational interviewing; MI: myocardial infarction; NA: not applicable; NR: not reported; NYHA: New York Heart Association; PCI: percutaneous coronary intervention; RCT: randomised controlled trial; SD: standard deviation; TTM: transtheoretical model.

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

Study	Reason for exclusion
Aamot 2014	Wrong intervention
Antypas 2014	Wrong intervention
Arietaleanizbeascoa 2015	Wrong intervention
Arrigo 2008	Wrong intervention and outcomes
Barkley 2013	Wrong intervention
Berg 2015	Wrong intervention
Bikmoradi 2016	Wrong comparator - no comparable CR programme
Blumenthal 2016	Wrong intervention
Borg 2017	CR not comprehensive
Boyne 2014	CR not comprehensive
Bubnova 2014	Wrong intervention
CebrickGrossman 2010	Wrong comparator - no comparable CR programme
CebrickGrossman 2016	Wrong intervention
Chair 2012	Wrong intervention
Chokshi 2018	CR not comprehensive
Claes 2017	Outcomes of interest not measured
Cooper 2016	Wrong intervention
Daltroy 1985	CR not comprehensive (i.e. exercise only)
Dankner 2015	Wrong study design
Devi 2014	Wrong comparator - no comparable CR programme
Doletsky 2014	CR not comprehensive
Dougherty 2015	CR not comprehensive
Duncan 2003	CR not comprehensive
Duncan 2014	CR not comprehensive (i.e. exercise only)
Everson-Rose 2016	Wrong comparator - no comparable CR programme
Frederix 2013a	Wrong intervention
Frederix 2013b	Wrong intervention
Frederix 2014	Wrong intervention

Study	Reason for exclusion
Frederix 2015	Wrong intervention
Frederix 2016	Wrong intervention
Fulton 2011	CR not comprehensive
Gaalema 2016	Wrong study design
Garcia 2013	Wrong intervention
Hawkes 2013	Wrong comparator - no comparable CR programme
Hillebrand 1995	Wrong intervention - intervention delivered after CR
Irazusta-Cordoba 2017	Outcomes of interest not measured
Izawa 2005	Wrong intervention - intervention delivered after CR
Kaminsky 2013	CR not comprehensive
Kidholm 2016	Outcomes of interest not measured
Korzeniowska Kubacka 2015	Wrong study design
Korzeniowska-Kubacka 2014	Wrong study design
Lear 2014	Wrong comparator - no comparable CR programme
Lear 2015	Wrong comparator - no comparable CR programme
Lewinter 2014	Wrong intervention
Li 2015	Wrong comparator - no comparable CR programme
Mayer Berger 2016	Wrong intervention
Melin 2014	Wrong intervention
Meng 2016	Wrong intervention
Mohammadi 2018	Wrong intervention
Moholdt 2012	Wrong intervention
Moore 2006	Wrong intervention - intervention delivered after CR
Murray 2014	Wrong study design
O'Neil 2012	Wrong intervention
Oerkild 2012	Wrong comparator - no comparable CR programme
Pandey 2016	Wrong intervention
Pandey 2017	Wrong comparator - no comparable CR programme

Study	Reason for exclusion
Pattyn 2016	Wrong intervention
PeclatFlores 2015	Wrong intervention
Peixoto 2015	Wrong comparator - no comparable CR programme
PfaeffliDale 2015a	Wrong comparator - no comparable CR programme
Piotrowicz 2012	Wrong study design
Piotrowicz 2015	Wrong comparator - no comparable CR programme
Poortaghi 2013	Wrong intervention
Reyes 2013	Wrong intervention
Rodrigues 2013	Wrong intervention
Ruivo 2017	CR not comprehensive
Safiyari Hafizi 2016	Wrong intervention
Sangster 2015	Wrong intervention
Sanjuan 2016	Wrong intervention
Shahriari 2013	Wrong intervention
Skobel 2017	Wrong intervention
Sniehotta 2006	CR not comprehensive (i.e. exercise only)
Takase 2015	Wrong comparator - no comparable CR programme
terHoeve 2018	Wrong intervention
Turkstra 2013	Wrong intervention
Uysal 2015	Wrong study design
Vahedian Azimi 2016	Wrong intervention
Vanhees 2014	Wrong intervention
Widmer 2017	Wrong intervention - no specific aim to increase CR utilisation
Wieczorrek 2016	CR not comprehensive
Wojcieszczyk 2012	Wrong intervention
Wolszakiewicz 2015	Wrong study design
Wood 2016	CR not comprehensive
Young 2016	Wrong intervention

Study	Reason for exclusion
Çavuşoğlu 2017	Wrong intervention

CR: cardiac rehabilitation.

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

Ivers 2017

Methods	Pragmatic, multi-centre, 3-arm RCT
Participants	Patients post MI
Interventions	Eligible patients were randomised to 1 of 3 study arms: (1) usual care (no standardised follow-up interventions); (2) usual care plus a series of mail-outs with content specifically designed to target the determinants of medication persistence and completion of CR, including information for participants to share with their personal clinicians; or (3) usual care, plus the same mail-outs, plus automated reminder telephone calls to identify participants at risk of non-adherence and a trained lay health worker (LHW) to provide additional support and navigation for such participants via telephone
Outcomes	One of 2 co-primary outcomes was assessed 12 months post MI: completion of CR. Secondary outcomes measured at 12 months included extent of CR attendance
Notes	Note that the protocol is published, and the trial has been concluded. Analyses are currently being performed

LaValley 2017

Methods	2-parallel-group RCT, single-blind
Participants	Sequential patients at risk for non-adherence to CR, based upon barriers identified at CR intake
Interventions	Participants randomised to the intervention group (n = 49) received a telephone call that centred on the participant's motivation for change, review of education received at orientation, risk factors, and goals. The control group received the standard of care (n = 61)
Outcomes	Percentage of participants in each group that attended the second exercise session Overall return rate
Notes	The manuscript presenting results has been drafted and submitted to journals for review

Rouleau 2017

Methods	2 parallel groups (1:1 concealed allocation), unblinded
Participants	Patients with acute coronary syndrome; 96 patients randomised to intervention (n = 47) and comparator groups (n = 49)
Interventions	Participants were randomised to a single 45-minute motivational interviewing session delivered after referral to, but before enrolment in, a 24-session outpatient CR programme or to usual care.

Rouleau 2017 *(Continued)*

	The intervention was aimed at enhancing perceived benefits of CR and eliminating barriers to enrolment/attendance
Outcomes	Primary outcome was intention to attend CR Secondary outcomes included CR participation
Notes	UPBEAT manuscript with outcomes is soon to be published in *Patient Education & Counselling*

Sunamura 2018

Methods	Parallel-group trial - 3 arms
Participants	Participants with acute coronary syndrome referred for CR who attended the initial orientation session; 914 participants randomised to intervention 1 (n = 309), intervention 2 (n = 299), or comparator (n = 306)
Interventions	Participants were randomised to 3 interventions: (1) 3-month standard CR; (2) standard CR including 3 additional face-to-face active lifestyle counselling sessions and extended with 3-group fitness training and general lifestyle counselling sessions in the first 9 months after standard CR; or (3) standard CR extended for 9 months with 5 to 6 telephone general lifestyle counselling sessions
Outcomes	Primary outcome: systematic coronary risk evaluation (SCORE) for 10-year cardiovascular mortality risk at 18-month follow-up
Notes	OPTICARE authors contacted for further details, as completion of allocated treatment was reported in each arm at the beginning of the results section but was not defined

Suskin 2006

Methods	2-parallel-group, single-blind
Participants	> 18 years of age; patients post MI, unstable angina, CABG surgery, or coronary angioplasty; 60 participants
Interventions	Pre-discharge videotape introducing the concept and benefit of CR; control participants not exposed to videotape
Outcomes	Primary outcome: expressed intent to participate in a CR secondary prevention programme Secondary outcomes: number of participants who continued to adhere to the 6-month CR secondary prevention programme beyond the initial expressed intent to participate
Notes	Study author contacted to verify if the study was conducted and published (i.e. no results are posted despite statement that final data were collected in August 2005)

Taylor 2010a

Methods	2 parallel groups (18 intervention and 13 control)
Participants	> 18 years of age; attending first CR class at 1 of 3 hospital sites

Taylor 2010a *(Continued)*

Interventions	1-session psychological intervention, aimed at changing participants' illness beliefs via motivational interviewing; control group received treatment as usual
Outcomes	Primary outcome: CR adherence operationalised as the number of total sessions attended, ascertained 3 months post recruitment
Notes	Trial shown as complete on clinicaltrials.gov (identifier # NCT00956657), but only very basic results posted. Study author contacted for further details

CABG: coronary artery bypass graft; CR: cardiac rehabilitation; LHW: lay health worker; MI: myocardial infarction; RCT: randomised controlled trial.

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

Collela 2016

Trial name or title	MyCardiacRecovery (MyCaRe)
Methods	2-parallel-group, pilot, single-blinded RCT
Participants	> 35 years of age; undergoing CABG surgery with an uncomplicated postoperative course; standard length of hospital stay (4 to 8 days); access to wifi Internet in their home; able to hear telephone conversation; residing within the greater Toronto region (GTA) or, if outside GTA, willing to return devices via mail upon study completion
Interventions	MyCardiacRecovery (MyCaRe) is an interactive platform (app) that includes a standardised educational curriculum and interactive tracking (e.g. activity progression using photo capabilities and Fitbit flex accelerometer) for support during the first 6 to 8 weeks post hospital discharge. This application will help patients and families navigate their way through the continuum of care by providing (1) an integrated link between acute care and outpatient CR for efficient co-ordination of information and reduction in duplication of services; (2) participant care and educational materials designed to address salient recovery questions; (3) improved communication between the participant and care providers; and (4) ensured streamlined systematic referral to CR. Control group receives usual care (which often includes CR referral); 20 participants per arm
Outcomes	Primary outcome: enrolment in CR (6 to 8 weeks post bypass)
Starting date	1 July 2016
Contact information	Tracey Colella, University of Health Network, Toronto, Ontario, Canada; email: tracey.colella@uhn.ca
Notes	

Gaalema 2014

Trial name or title	Increasing CR participation among Medicaid enrollees trial
Methods	2-parallel group RCT; unblinded
Participants	Medicaid (government-supported insurance plan for low-income patients) patients > 18 years old with recent myocardial infarction, revascularisation, or heart failure Randomising 130 participants

Gaalema 2014 *(Continued)*

Interventions	Using financial incentives for increasing CR participation. Participants will receive financial incentives contingent on initiation of and continued attendance at CR sessions Usual care group receives no incentives
Outcomes	Attendance at CR exercise sessions; cost-effectiveness also being tested
Starting date	1 January 2017
Contact information	Diann Gaalema, The University of Vermont, Human Behavioral Pharm Lab, Burlington, Vermont, United States; email: diann.gaalema@uvm.edu
Notes	Trial may not be eligible for this review, as primary outcome is attendance at exercise sessions (not CR sessions)

Suhar 2016

Trial name or title	Healing touch intervention in post-cardiac event patients prior to starting a cardiac rehab program trial
Methods	Parallel-group RCT
Participants	Patients referred for CR
Interventions	6 one-hour treatments over 3 weeks of healing touch therapy while participants wait to enter a CR programme
Outcomes	Improvement in stress and anxiety symptoms Metabolic equivalent of task Body mass index Attendance at CR sessions
Starting date	1 July 2017
Contact information	Christopher Suhar, Scripps Center for Integrative Medicine, San Diego, California, United States; email: suhar.christopher@scrippshealth.org
Notes	

CABG: coronary artery bypass graft; CR: cardiac rehabilitation; GTA: Greater Toronto area; RCT: randomised controlled trial.

DATA AND ANALYSES

Comparison 1. CR utilisation

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Enrolment	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2 Enrolment - CR setting	9	1650	Risk Ratio (M-H, Random, 95% CI)	1.12 [1.04, 1.21]
2.1 supervised	6	1247	Risk Ratio (M-H, Random, 95% CI)	1.11 [1.01, 1.22]
2.2 at least some unsupervised	4	403	Risk Ratio (M-H, Random, 95% CI)	1.15 [0.99, 1.32]
3 Enrolment - intervention target	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
3.1 patient	14	2499	Risk Ratio (M-H, Random, 95% CI)	1.22 [1.10, 1.35]
3.2 other	2	597	Risk Ratio (M-H, Random, 95% CI)	1.79 [1.40, 2.29]
4 Enrolment - intervention contacts	13	2659	Risk Ratio (M-H, Random, 95% CI)	1.32 [1.13, 1.54]
4.1 ≥ 5 contacts	4	535	Risk Ratio (M-H, Random, 95% CI)	1.38 [0.93, 2.05]
4.2 < 5 contacts	9	2124	Risk Ratio (M-H, Random, 95% CI)	1.31 [1.09, 1.57]
5 Enrolment - deliverer	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
5.1 any healthcare provider	6	1177	Risk Ratio (M-H, Random, 95% CI)	1.60 [1.28, 2.00]
5.2 other or no one	10	1919	Risk Ratio (M-H, Random, 95% CI)	1.17 [1.06, 1.29]
6 Enrolment - delivery format	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
6.1 any face-to-face	7	1361	Risk Ratio (M-H, Random, 95% CI)	1.59 [1.24, 2.05]
6.2 no face-to-face	9	1735	Risk Ratio (M-H, Random, 95% CI)	1.16 [1.06, 1.26]
7 Enrolment - theory-based	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
7.1 yes	7	1182	Risk Ratio (M-H, Random, 95% CI)	1.28 [1.09, 1.51]
7.2 no	9	1914	Risk Ratio (M-H, Random, 95% CI)	1.26 [1.07, 1.49]
8 Enrolment - outcome ascertainment	11	1835	Risk Ratio (M-H, Random, 95% CI)	1.42 [1.20, 1.68]
8.1 self-report	3	876	Risk Ratio (M-H, Random, 95% CI)	1.71 [1.40, 2.08]
8.2 chart report	8	959	Risk Ratio (M-H, Random, 95% CI)	1.33 [1.10, 1.61]
9 Enrolment - number of sites	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
9.1 multi-site	9	1786	Risk Ratio (M-H, Random, 95% CI)	1.22 [1.05, 1.43]
9.2 single-centre	7	1310	Risk Ratio (M-H, Random, 95% CI)	1.37 [1.13, 1.65]
10 Enrolment - cardiac indication	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
10.1 some patients with HF included	6	839	Risk Ratio (M-H, Random, 95% CI)	1.42 [1.18, 1.71]

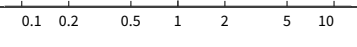
Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
10.2 no patients with HF included	10	2257	Risk Ratio (M-H, Random, 95% CI)	1.21 [1.06, 1.38]
11 Enrolment - region	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
11.1 North America	10	1811	Risk Ratio (M-H, Random, 95% CI)	1.35 [1.14, 1.61]
11.2 other	6	1285	Risk Ratio (M-H, Random, 95% CI)	1.21 [1.03, 1.42]
12 Enrolment - peer navigation	16	3096	Risk Ratio (M-H, Random, 95% CI)	1.27 [1.13, 1.42]
12.1 yes	4	596	Risk Ratio (M-H, Random, 95% CI)	1.69 [1.16, 2.45]
12.2 no	12	2500	Risk Ratio (M-H, Random, 95% CI)	1.23 [1.10, 1.37]
13 Enrolment - sensitivity analysis - low risk of bias studies	11	2155	Risk Ratio (M-H, Random, 95% CI)	1.29 [1.13, 1.48]
14 Enrolment - sensitivity analysis - without cluster RCT (Jolly)	15	2537	Risk Ratio (M-H, Random, 95% CI)	1.23 [1.11, 1.36]
15 Adherence	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
16 Adherence - deliverer	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
16.1 any healthcare provider	2	1077	Std. Mean Difference (IV, Random, 95% CI)	0.25 [0.05, 0.45]
16.2 other or no one	6	577	Std. Mean Difference (IV, Random, 95% CI)	0.44 [0.22, 0.66]
17 Adherence - delivery format	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
17.1 any face-to-face	5	1384	Std. Mean Difference (IV, Random, 95% CI)	0.37 [0.16, 0.59]
17.2 no face-to-face	3	270	Std. Mean Difference (IV, Random, 95% CI)	0.40 [0.05, 0.75]
18 Adherence - number of sites	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
18.1 multi-site	5	1233	Std. Mean Difference (IV, Random, 95% CI)	0.33 [0.08, 0.57]
18.2 single-centre	3	421	Std. Mean Difference (IV, Random, 95% CI)	0.46 [0.26, 0.65]
19 Adherence - cardiac indication	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]

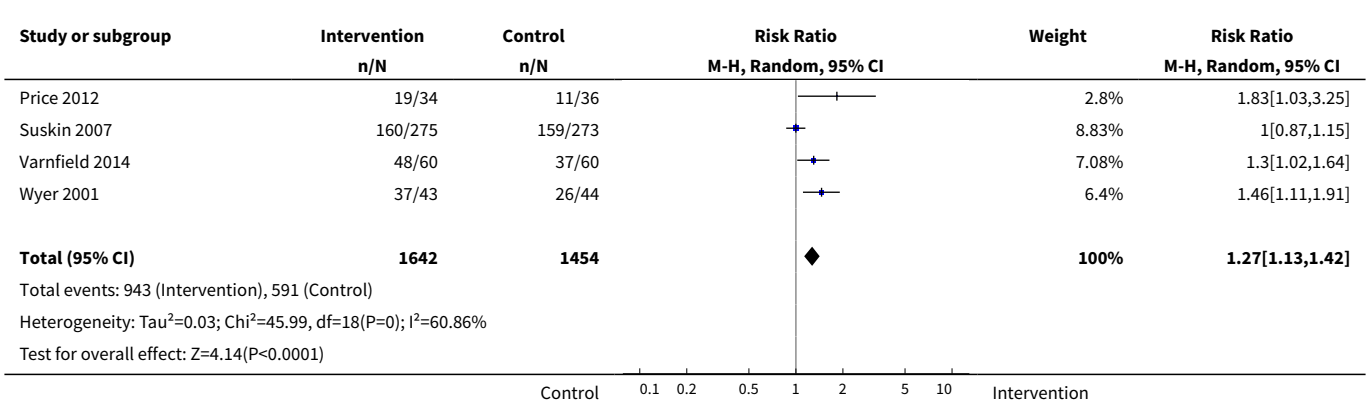
Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
19.1 some patients with HF included	3	1023	Std. Mean Difference (IV, Random, 95% CI)	0.52 [0.07, 0.97]
19.2 no patients with HF included	5	631	Std. Mean Difference (IV, Random, 95% CI)	0.35 [0.19, 0.51]
20 Adherence - CR setting	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
20.1 supervised	4	1203	Std. Mean Difference (IV, Random, 95% CI)	0.20 [0.09, 0.32]
20.2 at least some unsupervised	5	451	Std. Mean Difference (IV, Random, 95% CI)	0.56 [0.37, 0.76]
21 Adherence - region	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
21.1 North America	5	728	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.56]
21.2 other	3	926	Std. Mean Difference (IV, Random, 95% CI)	0.48 [0.01, 0.95]
22 Adherence - theory	8	1654	Std. Mean Difference (IV, Random, 95% CI)	0.38 [0.20, 0.55]
22.1 yes	6	1434	Std. Mean Difference (IV, Random, 95% CI)	0.39 [0.19, 0.59]
22.2 no	2	220	Std. Mean Difference (IV, Random, 95% CI)	0.36 [-0.10, 0.82]
23 Adherence - sensitivity analysis - low risk of bias studies	7	1613	Std. Mean Difference (IV, Random, 95% CI)	0.40 [0.21, 0.58]
24 Completion	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
25 Completion - CR setting	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
25.1 supervised	5	1219	Risk Ratio (M-H, Random, 95% CI)	1.09 [1.02, 1.17]
25.2 at least some unsupervised	3	346	Risk Ratio (M-H, Random, 95% CI)	1.24 [0.75, 2.07]
26 Completion - delivery format	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
26.1 any face-to-face	4	1128	Risk Ratio (M-H, Random, 95% CI)	1.07 [1.02, 1.13]
26.2 no face-to-face	3	437	Risk Ratio (M-H, Random, 95% CI)	1.34 [1.03, 1.75]
27 Completion - theory-based	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
27.1 yes	4	1128	Risk Ratio (M-H, Random, 95% CI)	1.07 [1.02, 1.13]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
27.2 no	3	437	Risk Ratio (M-H, Random, 95% CI)	1.34 [1.03, 1.75]
28 Completion - number of sites	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
28.1 multi-site	4	1177	Risk Ratio (M-H, Random, 95% CI)	1.07 [1.01, 1.13]
28.2 single-centre	3	388	Risk Ratio (M-H, Random, 95% CI)	1.46 [1.17, 1.82]
29 Completion - cardiac indication	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
29.1 some patients with HF included	4	1235	Risk Ratio (M-H, Random, 95% CI)	1.16 [1.00, 1.34]
29.2 no patients with HF included	3	330	Risk Ratio (M-H, Random, 95% CI)	1.09 [0.89, 1.34]
30 Completion - region	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
30.1 North America	5	620	Risk Ratio (M-H, Random, 95% CI)	1.05 [0.97, 1.14]
30.2 other	2	945	Risk Ratio (M-H, Random, 95% CI)	1.34 [0.85, 2.10]
31 Completion - CR programme duration	7	1565	Risk Ratio (M-H, Random, 95% CI)	1.13 [1.02, 1.25]
31.1 <12 weeks	3	986	Risk Ratio (M-H, Random, 95% CI)	1.22 [0.92, 1.60]
31.2 ≥12 weeks	4	579	Risk Ratio (M-H, Random, 95% CI)	1.06 [0.97, 1.14]
32 Completion - sensitivity analysis - low risk of bias studies	5	1404	Risk Ratio (M-H, Random, 95% CI)	1.14 [1.01, 1.29]

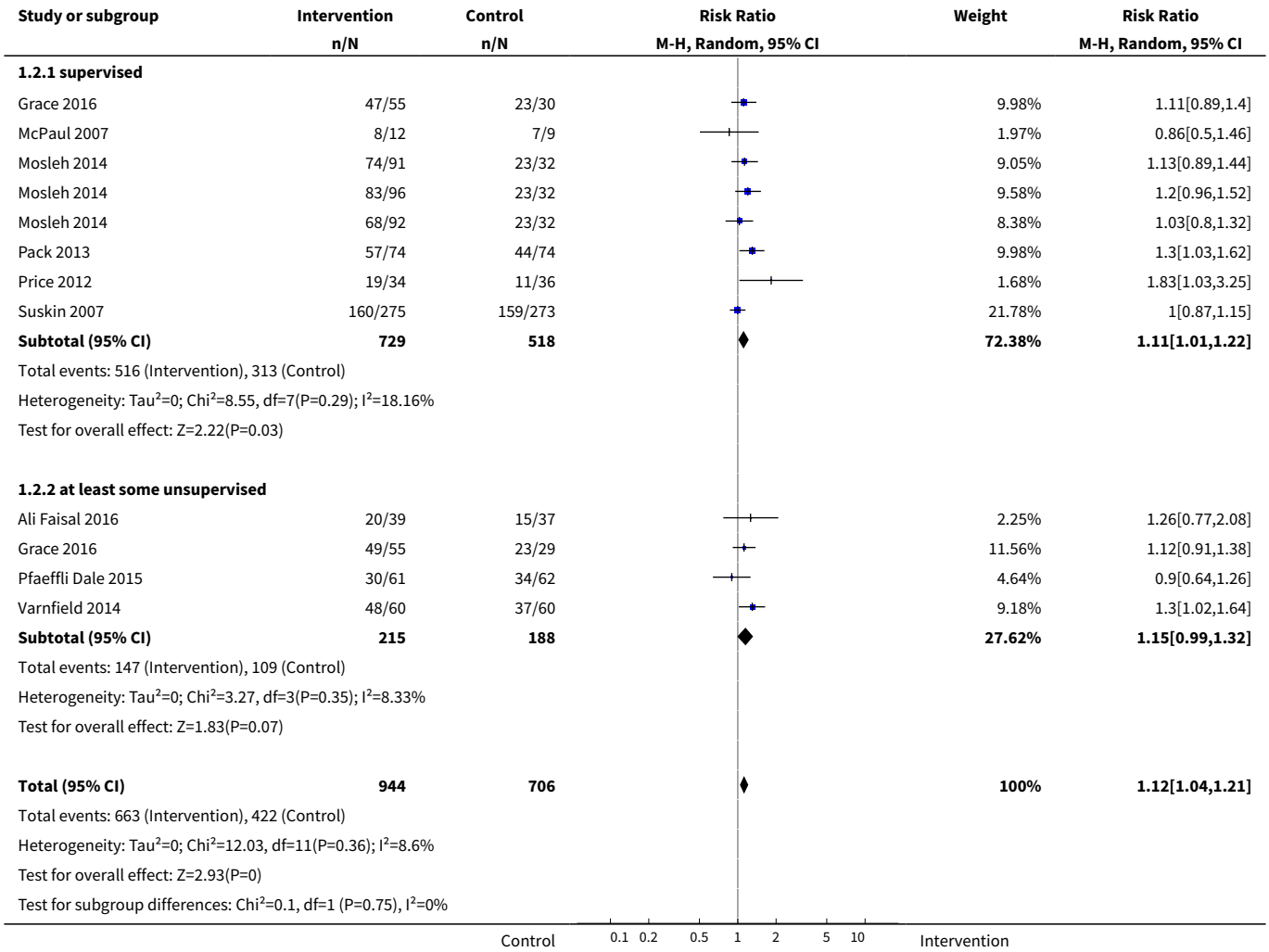
Analysis 1.1. Comparison 1 CR utilisation, Outcome 1 Enrolment.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Cossette 2012	54/121	29/121		4.83%	1.86[1.28,2.71]
Dolansky 2011	6/17	3/21		0.78%	2.47[0.72,8.45]
Grace 2016	47/55	23/30		7.28%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		7.62%	1.12[0.91,1.38]
Jolly 1999	109/262	70/297		6.83%	1.77[1.37,2.27]
McPaul 2007	8/12	7/9		3.14%	0.86[0.5,1.46]
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]



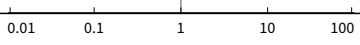


Analysis 1.2. Comparison 1 CR utilisation, Outcome 2 Enrolment - CR setting.



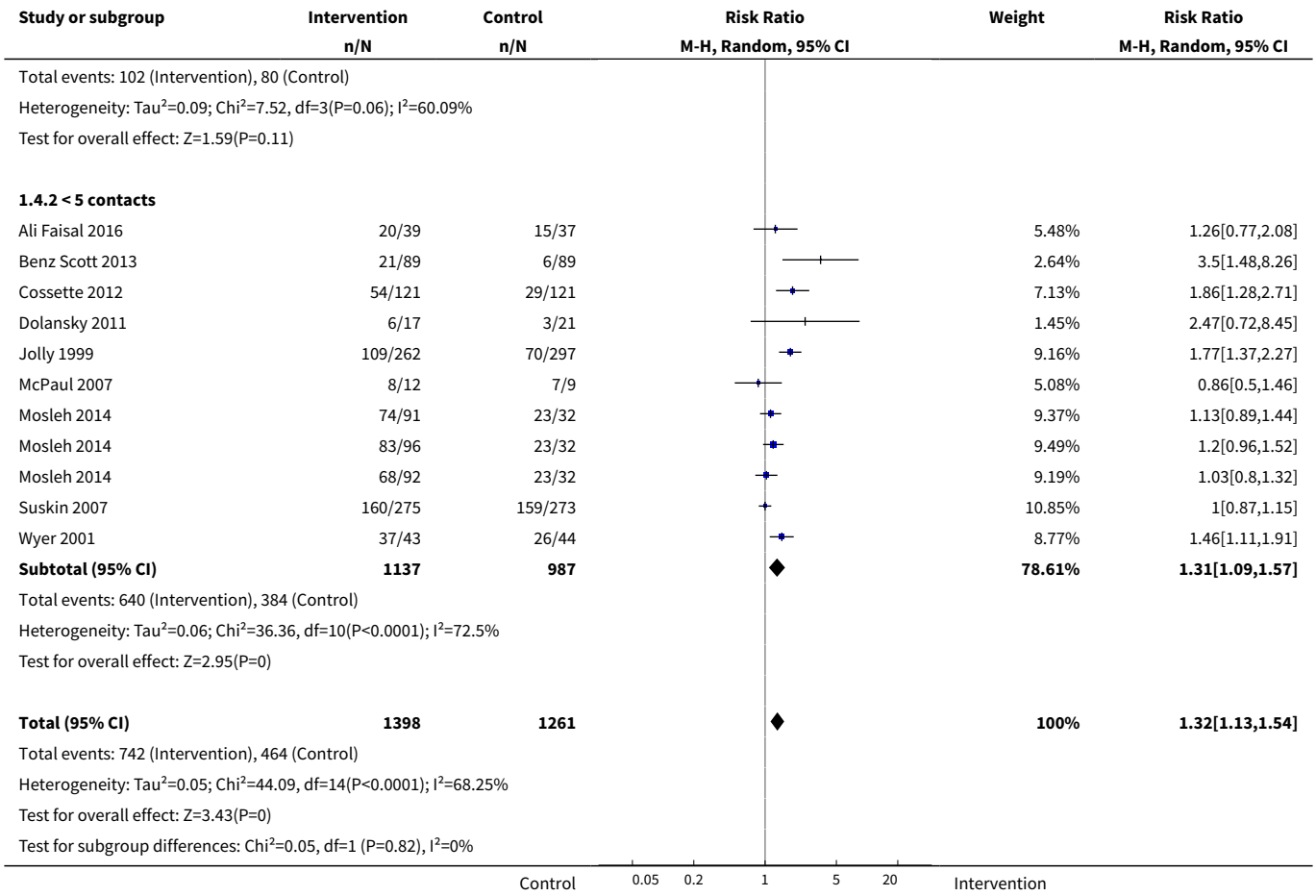
Analysis 1.3. Comparison 1 CR utilisation, Outcome 3 Enrolment - intervention target.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.3.1 patient					
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Cossette 2012	54/121	29/121		4.83%	1.86[1.28,2.71]
Grace 2016	49/55	23/29		7.62%	1.12[0.91,1.38]
Grace 2016	47/55	23/30		7.28%	1.11[0.89,1.4]
McPaul 2007	8/12	7/9		3.14%	0.86[0.5,1.46]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**1363**	**1136**		**92.39%**	**1.22[1.1,1.35]**
Total events: 828 (Intervention), 518 (Control)					
Heterogeneity: Tau^2=0.02; Chi^2=32.86, df=16(P=0.01); I^2=51.31%					
Test for overall effect: Z=3.77(P=0)					
1.3.2 other					
Dolansky 2011	6/17	3/21		0.78%	2.47[0.72,8.45]
Jolly 1999	109/262	70/297		6.83%	1.77[1.37,2.27]
Subtotal (95% CI)	**279**	**318**		**7.61%**	**1.79[1.4,2.29]**
Total events: 115 (Intervention), 73 (Control)					
Heterogeneity: Tau^2=0; Chi^2=0.28, df=1(P=0.6); I^2=0%					
Test for overall effect: Z=4.65(P<0.0001)					
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=45.99, df=18(P=0); I^2=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi^2=7.92, df=1 (P=0), I^2=87.37%					

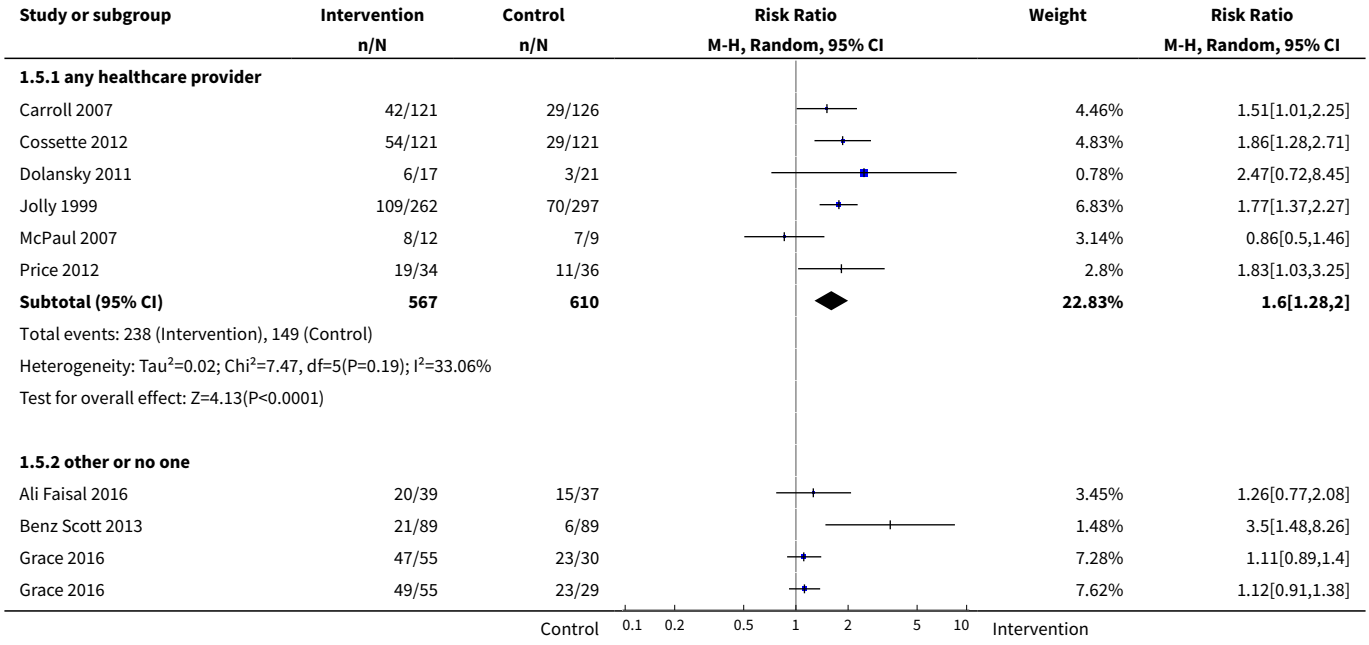


Analysis 1.4. Comparison 1 CR utilisation, Outcome 4 Enrolment - intervention contacts.

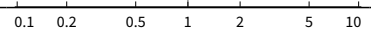
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.4.1 ≥ 5 contacts					
Carroll 2007	42/121	29/126		6.72%	1.51[1.01,2.25]
Parry 2009	11/45	6/50		2.41%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		7.66%	0.9[0.64,1.26]
Price 2012	19/34	11/36		4.61%	1.83[1.03,3.25]
Subtotal (95% CI)	**261**	**274**		**21.39%**	**1.38[0.93,2.05]**



Analysis 1.5. Comparison 1 CR utilisation, Outcome 5 Enrolment - deliverer.

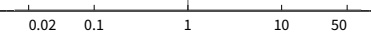


Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**1075**	**844**		**77.17%**	**1.17[1.06,1.29]**
Total events: 705 (Intervention), 442 (Control)					
Heterogeneity: Tau^2=0.01; Chi^2=20.02, df=12(P=0.07); I^2=40.06%					
Test for overall effect: Z=3.19(P=0)					
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=45.99, df=18(P=0); I^2=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi^2=6.43, df=1 (P=0.01), I^2=84.45%					

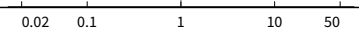


Analysis 1.6. Comparison 1 CR utilisation, Outcome 6 Enrolment - delivery format.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.6.1 any face-to-face					
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Cossette 2012	54/121	29/121		4.83%	1.86[1.28,2.71]
Dolansky 2011	6/17	3/21		0.78%	2.47[0.72,8.45]
Jolly 1999	109/262	70/297		6.83%	1.77[1.37,2.27]
McPaul 2007	8/12	7/9		3.14%	0.86[0.5,1.46]
Subtotal (95% CI)	**661**	**700**		**24.96%**	**1.59[1.24,2.05]**
Total events: 260 (Intervention), 159 (Control)					
Heterogeneity: Tau^2=0.05; Chi^2=11.66, df=6(P=0.07); I^2=48.55%					
Test for overall effect: Z=3.62(P=0)					
1.6.2 no face-to-face					
Grace 2016	47/55	23/30		7.28%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		7.62%	1.12[0.91,1.38]
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]

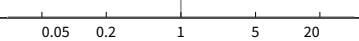


Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**981**	**754**		**75.04%**	**1.16[1.06,1.26]**
Total events: 683 (Intervention), 432 (Control)					
Heterogeneity: Tau^2=0.01; Chi^2=15.77, df=11(P=0.15); I^2=30.26%					
Test for overall effect: Z=3.29(P=0)					
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=45.99, df=18(P=0); I^2=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi^2=5.49, df=1 (P=0.02), I^2=81.78%					



Analysis 1.7. Comparison 1 CR utilisation, Outcome 7 Enrolment - theory-based.

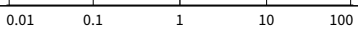
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.7.1 yes					
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Cossette 2012	54/121	29/121		4.83%	1.86[1.28,2.71]
Dolansky 2011	6/17	3/21		0.78%	2.47[0.72,8.45]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**676**	**506**		**45.66%**	**1.28[1.09,1.51]**
Total events: 413 (Intervention), 201 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=17.23, df=8(P=0.03); I^2=53.56%					
Test for overall effect: Z=2.97(P=0)					
1.7.2 no					
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Grace 2016	47/55	23/30		7.28%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		7.62%	1.12[0.91,1.38]
Jolly 1999	109/262	70/297		6.83%	1.77[1.37,2.27]
McPaul 2007	8/12	7/9		3.14%	0.86[0.5,1.46]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Subtotal (95% CI)	**966**	**948**		**54.34%**	**1.26[1.07,1.49]**
Total events: 530 (Intervention), 390 (Control)					
Heterogeneity: Tau^2=0.04; Chi^2=28.33, df=9(P=0); I^2=68.23%					
Test for overall effect: Z=2.79(P=0.01)					



Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=45.99, df=18(P=0); I^2=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi^2=0.02, df=1 (P=0.89), I^2=0%					

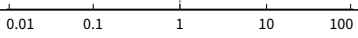
Analysis 1.8. Comparison 1 CR utilisation, Outcome 8 Enrolment - outcome ascertainment.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.8.1 self-report					
Carroll 2007	42/121	29/126		8.27%	1.51[1.01,2.25]
Jolly 1999	109/262	70/297		11.66%	1.77[1.37,2.27]
Price 2012	19/34	11/36		5.51%	1.83[1.03,3.25]
Subtotal (95% CI)	**417**	**459**		**25.44%**	**1.71[1.4,2.08]**
Total events: 170 (Intervention), 110 (Control)					
Heterogeneity: Tau^2=0; Chi^2=0.49, df=2(P=0.78); I^2=0%					
Test for overall effect: Z=5.25(P<0.0001)					
1.8.2 chart report					
Ali Faisal 2016	20/39	15/37		6.63%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		3.07%	3.5[1.48,8.26]
Cossette 2012	54/121	29/121		8.82%	1.86[1.28,2.71]
Dolansky 2011	6/17	3/21		1.67%	2.47[0.72,8.45]
Grace 2016	47/55	23/30		12.25%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		12.68%	1.12[0.91,1.38]
McPaul 2007	8/12	7/9		6.11%	0.86[0.5,1.46]
Pack 2013	57/74	44/74		12.25%	1.3[1.03,1.62]
Wyer 2001	37/43	26/44		11.09%	1.46[1.11,1.91]
Subtotal (95% CI)	**505**	**454**		**74.56%**	**1.33[1.1,1.61]**
Total events: 299 (Intervention), 176 (Control)					
Heterogeneity: Tau^2=0.04; Chi^2=20.32, df=8(P=0.01); I^2=60.63%					
Test for overall effect: Z=2.99(P=0)					
Total (95% CI)	**922**	**913**		**100%**	**1.42[1.2,1.68]**
Total events: 469 (Intervention), 286 (Control)					
Heterogeneity: Tau^2=0.05; Chi^2=29.25, df=11(P=0); I^2=62.39%					
Test for overall effect: Z=4.08(P<0.0001)					
Test for subgroup differences: Chi^2=3.11, df=1 (P=0.08), I^2=67.8%					

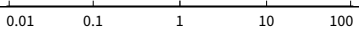


Analysis 1.9. Comparison 1 CR utilisation, Outcome 9 Enrolment - number of sites.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.9.1 multi-site					

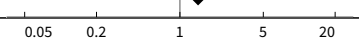


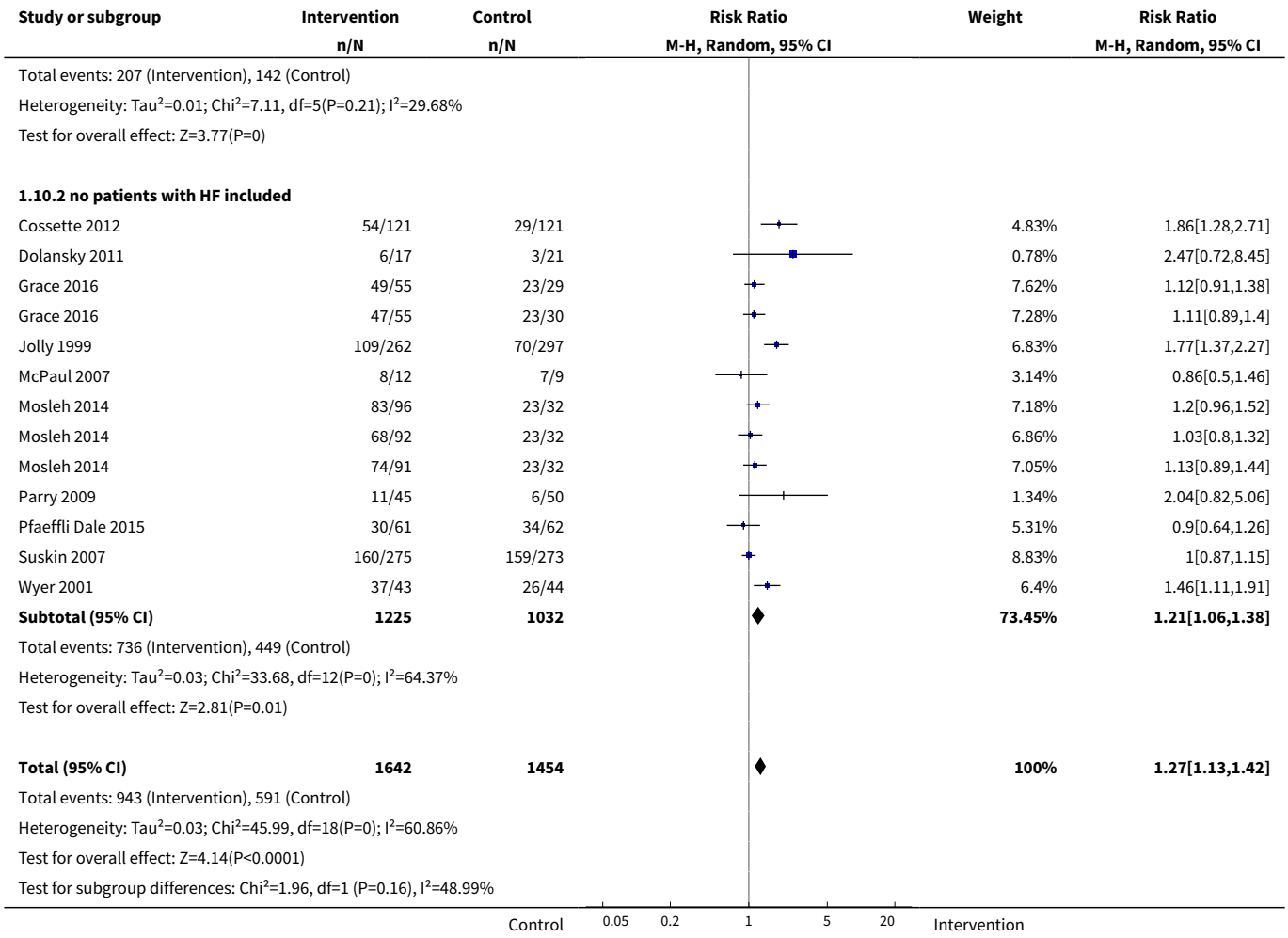
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Dolansky 2011	6/17	3/21		0.78%	2.47[0.72,8.45]
Grace 2016	47/55	23/30		7.28%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		7.62%	1.12[0.91,1.38]
Jolly 1999	109/262	70/297		6.83%	1.77[1.37,2.27]
McPaul 2007	8/12	7/9		3.14%	0.86[0.5,1.46]
Mosleh 2014	68/92	23/32		6.86%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		7.18%	1.2[0.96,1.52]
Mosleh 2014	74/91	23/32		7.05%	1.13[0.89,1.44]
Pfaeffli Dale 2015	30/61	34/62		5.31%	0.9[0.64,1.26]
Subtotal (95% CI)	**990**	**796**		**61.44%**	**1.22[1.05,1.43]**
Total events: 557 (Intervention), 279 (Control)					
Heterogeneity: Tau^2=0.04; Chi^2=29.54, df=11(P=0); I^2=62.76%					
Test for overall effect: Z=2.54(P=0.01)					
1.9.2 single-centre					
Cossette 2012	54/121	29/121		4.83%	1.86[1.28,2.71]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.34%	2.04[0.82,5.06]
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**652**	**658**		**38.56%**	**1.37[1.13,1.65]**
Total events: 386 (Intervention), 312 (Control)					
Heterogeneity: Tau^2=0.04; Chi^2=17.97, df=6(P=0.01); I^2=66.62%					
Test for overall effect: Z=3.18(P=0)					
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau^2=0.03; Chi^2=45.99, df=18(P=0); I^2=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi^2=0.79, df=1 (P=0.38), I^2=0%					



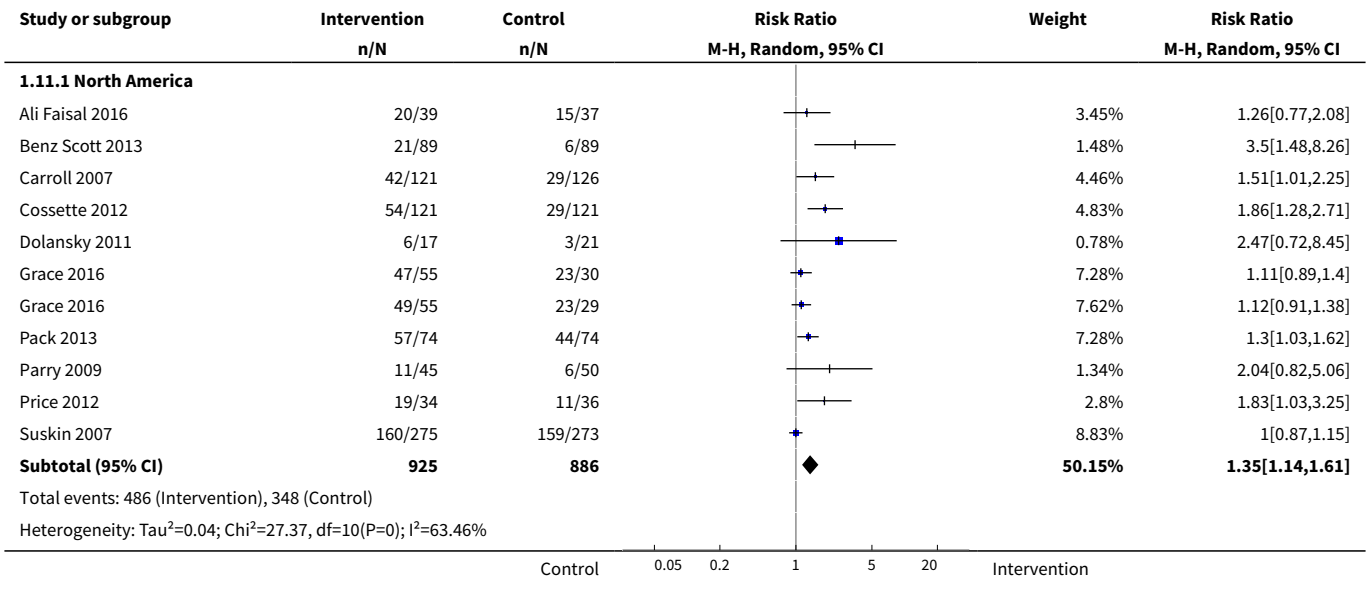
Analysis 1.10. Comparison 1 CR utilisation, Outcome 10 Enrolment - cardiac indication.

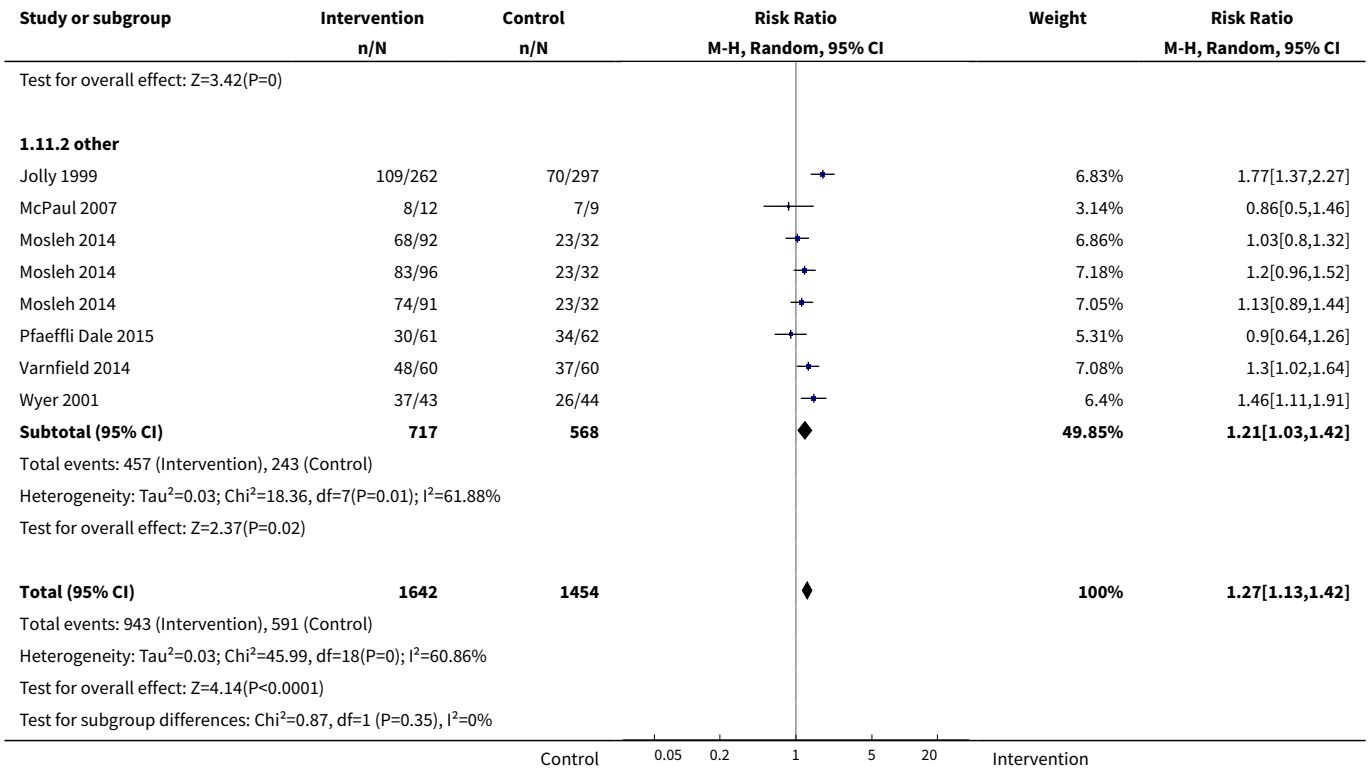
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.10.1 some patients with HF included					
Ali Faisal 2016	20/39	15/37		3.45%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		1.48%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.46%	1.51[1.01,2.25]
Pack 2013	57/74	44/74		7.28%	1.3[1.03,1.62]
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Subtotal (95% CI)	**417**	**422**		**26.55%**	**1.42[1.18,1.71]**



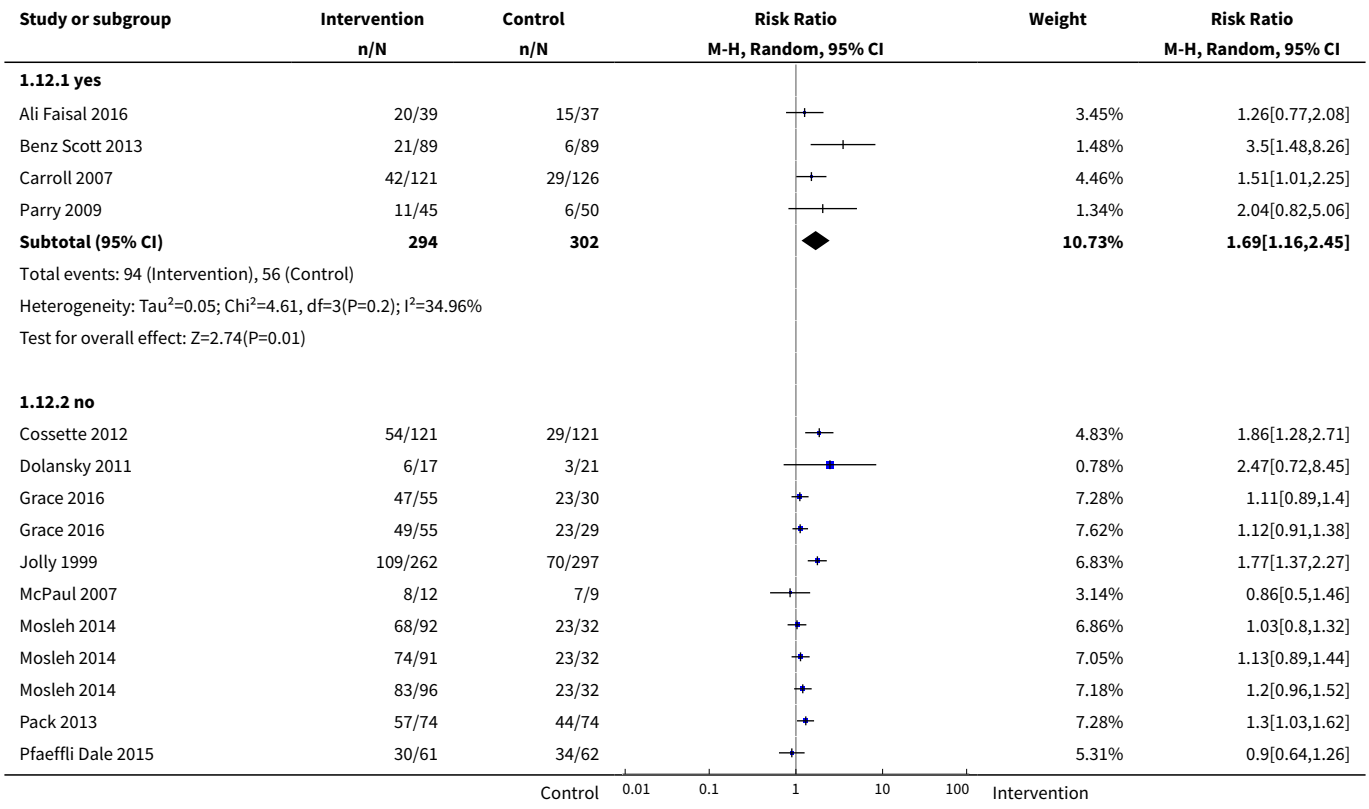


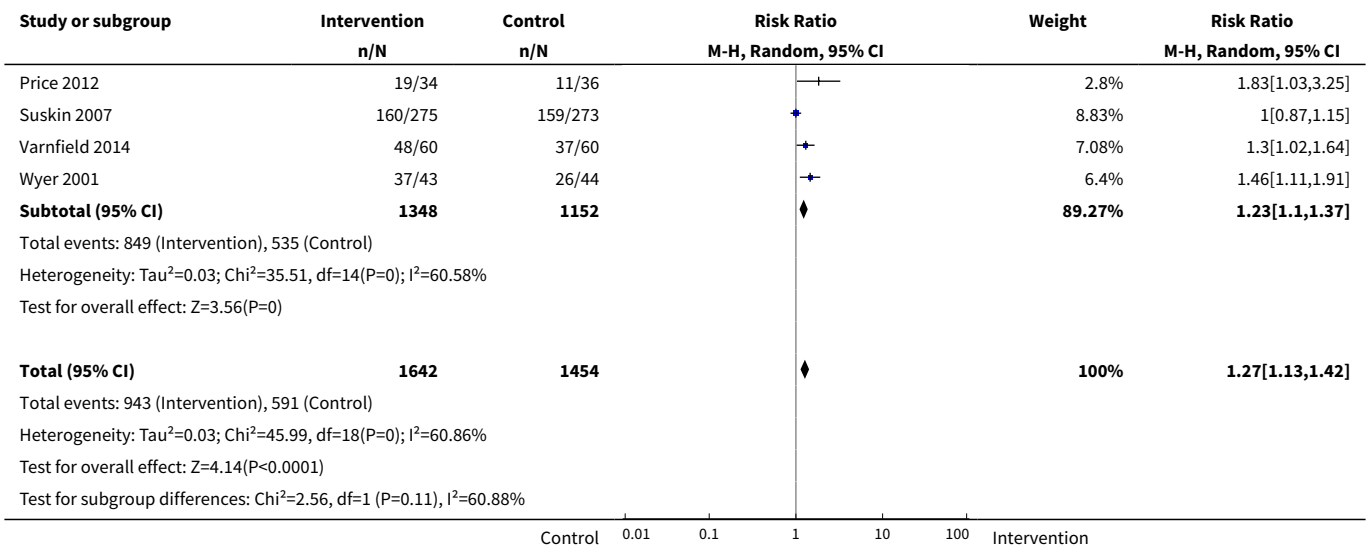
Analysis 1.11. Comparison 1 CR utilisation, Outcome 11 Enrolment - region.





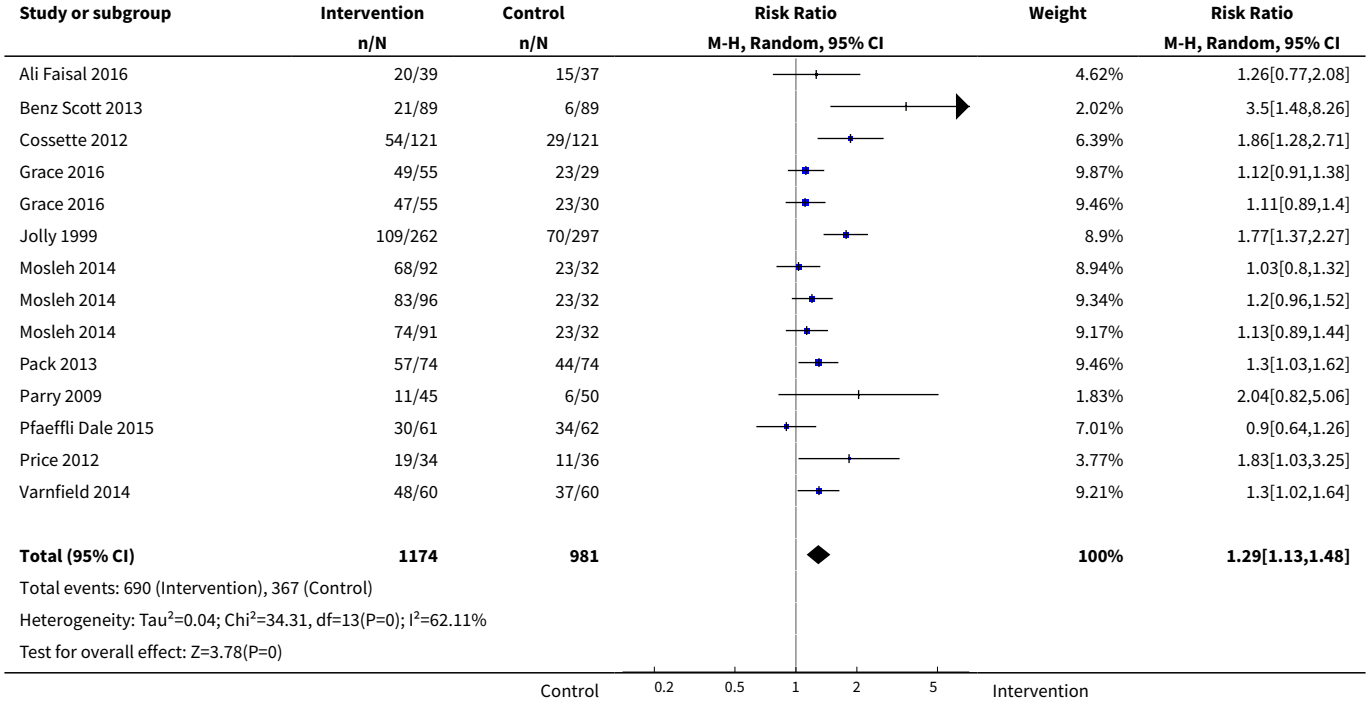
Analysis 1.12. Comparison 1 CR utilisation, Outcome 12 Enrolment - peer navigation.





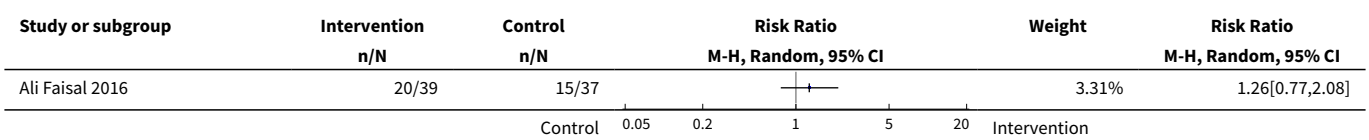
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Price 2012	19/34	11/36		2.8%	1.83[1.03,3.25]
Suskin 2007	160/275	159/273		8.83%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.08%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.4%	1.46[1.11,1.91]
Subtotal (95% CI)	**1348**	**1152**		**89.27%**	**1.23[1.1,1.37]**
Total events: 849 (Intervention), 535 (Control)					
Heterogeneity: Tau²=0.03; Chi²=35.51, df=14(P=0); I²=60.58%					
Test for overall effect: Z=3.56(P=0)					
Total (95% CI)	**1642**	**1454**		**100%**	**1.27[1.13,1.42]**
Total events: 943 (Intervention), 591 (Control)					
Heterogeneity: Tau²=0.03; Chi²=45.99, df=18(P=0); I²=60.86%					
Test for overall effect: Z=4.14(P<0.0001)					
Test for subgroup differences: Chi²=2.56, df=1 (P=0.11), I²=60.88%					

Analysis 1.13. Comparison 1 CR utilisation, Outcome 13 Enrolment - sensitivity analysis - low risk of bias studies.



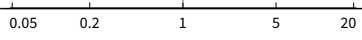
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Ali Faisal 2016	20/39	15/37		4.62%	1.26[0.77,2.08]
Benz Scott 2013	21/89	6/89		2.02%	3.5[1.48,8.26]
Cossette 2012	54/121	29/121		6.39%	1.86[1.28,2.71]
Grace 2016	49/55	23/29		9.87%	1.12[0.91,1.38]
Grace 2016	47/55	23/30		9.46%	1.11[0.89,1.4]
Jolly 1999	109/262	70/297		8.9%	1.77[1.37,2.27]
Mosleh 2014	68/92	23/32		8.94%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		9.34%	1.2[0.96,1.52]
Mosleh 2014	74/91	23/32		9.17%	1.13[0.89,1.44]
Pack 2013	57/74	44/74		9.46%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.83%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		7.01%	0.9[0.64,1.26]
Price 2012	19/34	11/36		3.77%	1.83[1.03,3.25]
Varnfield 2014	48/60	37/60		9.21%	1.3[1.02,1.64]
Total (95% CI)	**1174**	**981**		**100%**	**1.29[1.13,1.48]**
Total events: 690 (Intervention), 367 (Control)					
Heterogeneity: Tau²=0.04; Chi²=34.31, df=13(P=0); I²=62.11%					
Test for overall effect: Z=3.78(P=0)					

Analysis 1.14. Comparison 1 CR utilisation, Outcome 14 Enrolment - sensitivity analysis - without cluster RCT (Jolly).



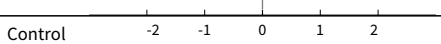
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Ali Faisal 2016	20/39	15/37		3.31%	1.26[0.77,2.08]

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Benz Scott 2013	21/89	6/89		1.33%	3.5[1.48,8.26]
Carroll 2007	42/121	29/126		4.44%	1.51[1.01,2.25]
Cossette 2012	54/121	29/121		4.87%	1.86[1.28,2.71]
Dolansky 2011	6/17	3/21		0.68%	2.47[0.72,8.45]
Grace 2016	47/55	23/30		8.09%	1.11[0.89,1.4]
Grace 2016	49/55	23/29		8.59%	1.12[0.91,1.38]
McPaul 2007	8/12	7/9		2.98%	0.86[0.5,1.46]
Mosleh 2014	68/92	23/32		7.49%	1.03[0.8,1.32]
Mosleh 2014	83/96	23/32		7.95%	1.2[0.96,1.52]
Mosleh 2014	74/91	23/32		7.76%	1.13[0.89,1.44]
Pack 2013	57/74	44/74		8.09%	1.3[1.03,1.62]
Parry 2009	11/45	6/50		1.2%	2.04[0.82,5.06]
Pfaeffli Dale 2015	30/61	34/62		5.45%	0.9[0.64,1.26]
Price 2012	19/34	11/36		2.62%	1.83[1.03,3.25]
Suskin 2007	160/275	159/273		10.49%	1[0.87,1.15]
Varnfield 2014	48/60	37/60		7.81%	1.3[1.02,1.64]
Wyer 2001	37/43	26/44		6.87%	1.46[1.11,1.91]
Total (95% CI)	**1380**	**1157**		**100%**	**1.23[1.11,1.36]**
Total events: 834 (Intervention), 521 (Control)					
Heterogeneity: Tau²=0.02; Chi²=34.48, df=17(P=0.01); I²=50.69%					
Test for overall effect: Z=3.85(P=0)					



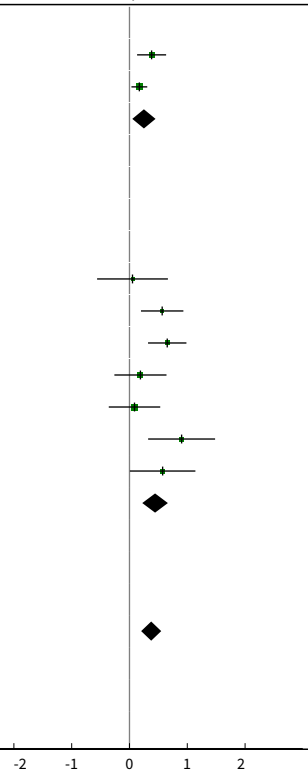
Analysis 1.15. Comparison 1 CR utilisation, Outcome 15 Adherence.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau²=0.03; Chi²=17.01, df=8(P=0.03); I²=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							



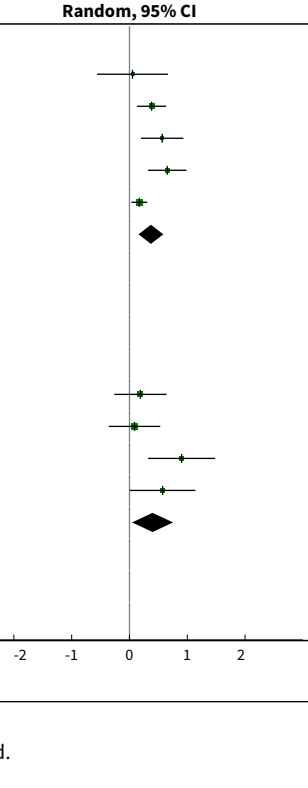
Analysis 1.16. Comparison 1 CR utilisation, Outcome 16 Adherence - deliverer.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.16.1 any healthcare provider							
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**554**		**523**			**37.37%**	**0.25[0.05,0.45]**
Heterogeneity: Tau^2=0.01; Chi^2=2.12, df=1(P=0.15); I^2=52.84%							
Test for overall effect: Z=2.43(P=0.02)							
1.16.2 other or no one							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Subtotal ***	**313**		**264**			**62.63%**	**0.44[0.22,0.66]**
Heterogeneity: Tau^2=0.03; Chi^2=9.79, df=6(P=0.13); I^2=38.74%							
Test for overall effect: Z=3.91(P<0.0001)							
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau^2=0.03; Chi^2=17.01, df=8(P=0.03); I^2=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi^2=1.6, df=1 (P=0.21), I^2=37.49%							

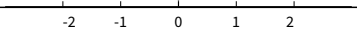


Analysis 1.17. Comparison 1 CR utilisation, Outcome 17 Adherence - delivery format.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.17.1 any face-to-face							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**708**		**676**			**68.02%**	**0.37[0.16,0.59]**
Heterogeneity: Tau^2=0.03; Chi^2=10.8, df=4(P=0.03); I^2=62.97%							
Test for overall effect: Z=3.38(P=0)							
1.17.2 no face-to-face							
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Subtotal ***	**159**		**111**			**31.98%**	**0.4[0.05,0.75]**
Heterogeneity: Tau^2=0.06; Chi^2=5.91, df=3(P=0.12); I^2=49.2%							
Test for overall effect: Z=2.21(P=0.03)							

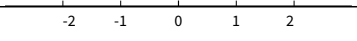


Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau²=0.03; Chi²=17.01, df=8(P=0.03); I²=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi²=0.02, df=1 (P=0.89), I²=0%							



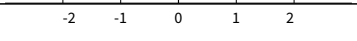
Analysis 1.18. Comparison 1 CR utilisation, Outcome 18 Adherence - number of sites.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.18.1 multi-site							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**641**		**592**			**65.35%**	**0.33[0.08,0.57]**
Heterogeneity: Tau²=0.05; Chi²=12.81, df=5(P=0.03); I²=60.96%							
Test for overall effect: Z=2.6(P=0.01)							
1.18.2 single-centre							
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Subtotal ***	**226**		**195**			**34.65%**	**0.46[0.26,0.65]**
Heterogeneity: Tau²=0; Chi²=0.84, df=2(P=0.66); I²=0%							
Test for overall effect: Z=4.6(P<0.0001)							
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau²=0.03; Chi²=17.01, df=8(P=0.03); I²=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi²=0.67, df=1 (P=0.41), I²=0%							

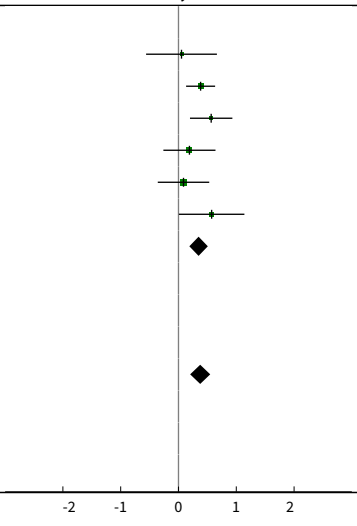


Analysis 1.19. Comparison 1 CR utilisation, Outcome 19 Adherence - cardiac indication.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.19.1 some patients with HF included							
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**510**		**513**			**40.68%**	**0.52[0.07,0.97]**
Heterogeneity: Tau²=0.12; Chi²=11.72, df=2(P=0); I²=82.94%							
Test for overall effect: Z=2.26(P=0.02)							

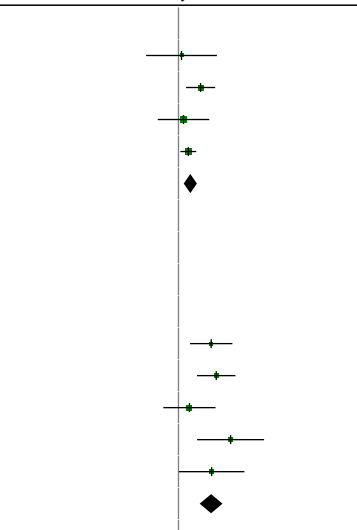


Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.19.2 no patients with HF included							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Subtotal ***	**357**		**274**			**59.32%**	**0.35[0.19,0.51]**
Heterogeneity: Tau^2=0; Chi^2=4.73, df=5(P=0.45); I^2=0%							
Test for overall effect: Z=4.26(P<0.0001)							
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau^2=0.03; Chi^2=17.01, df=8(P=0.03); I^2=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi^2=0.49, df=1 (P=0.48), I^2=0%							



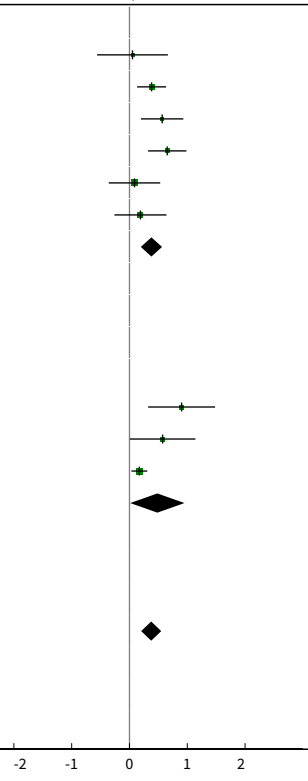
Analysis 1.20. Comparison 1 CR utilisation, Outcome 20 Adherence - CR setting.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.20.1 supervised							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**630**		**573**			**52.8%**	**0.2[0.09,0.32]**
Heterogeneity: Tau^2=0; Chi^2=2.68, df=3(P=0.44); I^2=0%							
Test for overall effect: Z=3.52(P=0)							
1.20.2 at least some unsupervised							
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Subtotal ***	**237**		**214**			**47.2%**	**0.56[0.37,0.76]**
Heterogeneity: Tau^2=0; Chi^2=4.24, df=4(P=0.37); I^2=5.59%							
Test for overall effect: Z=5.6(P<0.0001)							
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau^2=0.03; Chi^2=17.01, df=8(P=0.03); I^2=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi^2=9.55, df=1 (P=0), I^2=89.53%							



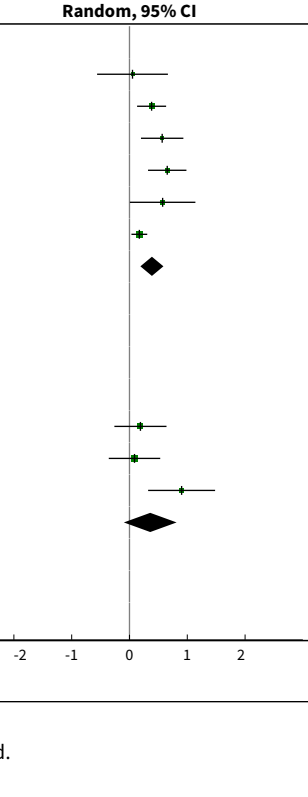
Analysis 1.21. Comparison 1 CR utilisation, Outcome 21 Adherence - region.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.21.1 North America							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Subtotal ***	**405**		**323**			**65.44%**	**0.38[0.2,0.56]**
Heterogeneity: Tau^2=0.01; Chi^2=7.01, df=5(P=0.22); I^2=28.62%							
Test for overall effect: Z=4.05(P<0.0001)							
1.21.2 other							
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**462**		**464**			**34.56%**	**0.48[0.01,0.95]**
Heterogeneity: Tau^2=0.12; Chi^2=7.31, df=2(P=0.03); I^2=72.64%							
Test for overall effect: Z=2.01(P=0.04)							
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau^2=0.03; Chi^2=17.01, df=8(P=0.03); I^2=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi^2=0.16, df=1 (P=0.69), I^2=0%							

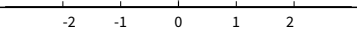


Analysis 1.22. Comparison 1 CR utilisation, Outcome 22 Adherence - theory.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.22.1 yes							
Ashe 1993	21	90.1 (24.6)	20	88.9 (20.2)		6.05%	0.05[-0.56,0.66]
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		16.17%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		11.69%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		12.9%	0.65[0.32,0.99]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		6.79%	0.57[0.01,1.14]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.2%	0.17[0.03,0.31]
Subtotal ***	**733**		**701**			**74.81%**	**0.39[0.19,0.59]**
Heterogeneity: Tau^2=0.03; Chi^2=11.75, df=5(P=0.04); I^2=57.44%							
Test for overall effect: Z=3.81(P=0)							
1.22.2 no							
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.24%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		9.38%	0.09[-0.36,0.53]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		6.57%	0.9[0.32,1.48]
Subtotal ***	**134**		**86**			**25.19%**	**0.36[-0.1,0.82]**
Heterogeneity: Tau^2=0.1; Chi^2=5.25, df=2(P=0.07); I^2=61.92%							
Test for overall effect: Z=1.54(P=0.12)							



Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
Total ***	**867**		**787**			**100%**	**0.38[0.2,0.55]**
Heterogeneity: Tau²=0.03; Chi²=17.01, df=8(P=0.03); I²=52.97%							
Test for overall effect: Z=4.24(P<0.0001)							
Test for subgroup differences: Chi²=0.01, df=1 (P=0.91), I²=0%							

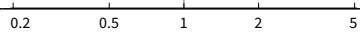


Analysis 1.23. Comparison 1 CR utilisation, Outcome 23 Adherence - sensitivity analysis - low risk of bias studies.

Study or subgroup	Intervention N	Intervention Mean(SD)	Control N	Control Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
Beckie 2010	141	88.9 (25)	111	77.8 (33.3)		17.05%	0.38[0.13,0.63]
Farias-Godoy 2013	60	97.3 (62.6)	59	70.5 (22)		12.53%	0.57[0.2,0.93]
Focht 2004	73	90.9 (21.9)	74	77.9 (17.6)		13.76%	0.65[0.32,0.99]
Grace 2016	55	58.1 (35.4)	29	51.3 (35.7)		9.98%	0.19[-0.26,0.64]
Grace 2016	55	54.4 (34.7)	30	51.3 (35.7)		10.14%	0.09[-0.36,0.53]
Hwang 2017	24	83.3 (25)	27	58.3 (29.2)		7.17%	0.9[0.32,1.48]
Kraal 2014	25	100 (30)	25	85.4 (18.8)		7.4%	0.57[0.01,1.14]
Lynggaard 2017	413	81.7 (29.2)	412	76.3 (34.2)		21.96%	0.17[0.03,0.31]
Total ***	**846**		**767**			**100%**	**0.4[0.21,0.58]**
Heterogeneity: Tau²=0.04; Chi²=16.37, df=7(P=0.02); I²=57.24%							
Test for overall effect: Z=4.25(P<0.0001)							

Analysis 1.24. Comparison 1 CR utilisation, Outcome 24 Completion.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Ashe 1993	17/21	16/20		9.29%	1.01[0.75,1.37]
Focht 2004	65/68	68/74		31.17%	1.04[0.96,1.13]
Grace 2016	20/55	10/29		2.76%	1.05[0.57,1.94]
Grace 2016	21/55	11/30		3.06%	1.04[0.58,1.86]
Lynggaard 2017	341/413	312/412		33.26%	1.09[1.02,1.17]
Oldridge 1983	34/63	24/57		6.41%	1.28[0.88,1.87]
Pack 2013	27/74	22/74		4.6%	1.23[0.77,1.95]
Varnfield 2014	48/60	28/60		9.44%	1.71[1.27,2.31]
Total (95% CI)	**809**	**756**		**100%**	**1.13[1.02,1.25]**
Total events: 573 (Intervention), 491 (Control)					
Heterogeneity: Tau²=0.01; Chi²=13.3, df=7(P=0.07); I²=47.37%					
Test for overall effect: Z=2.25(P=0.02)					

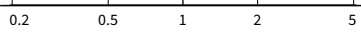


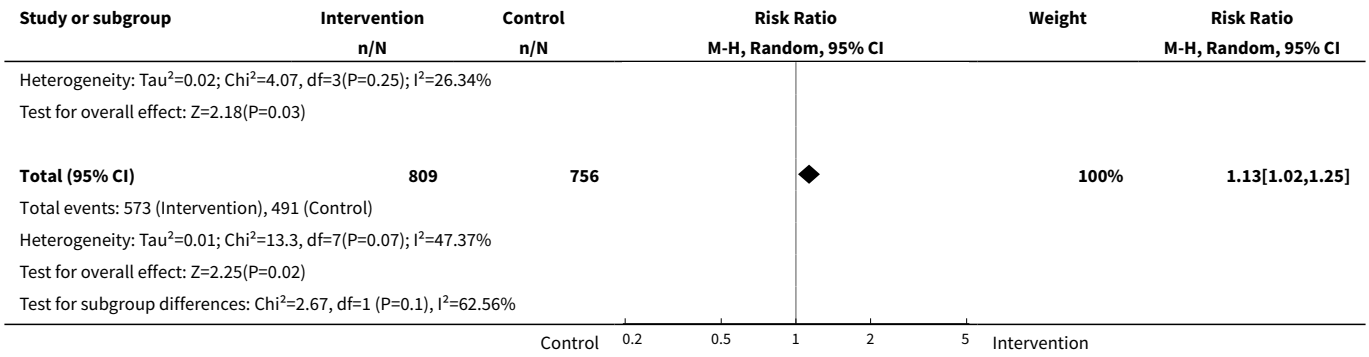
Analysis 1.25. Comparison 1 CR utilisation, Outcome 25 Completion - CR setting.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.25.1 supervised					
Ashe 1993	17/21	16/20		9.29%	1.01[0.75,1.37]
Grace 2016	21/55	11/30		3.06%	1.04[0.58,1.86]
Lynggaard 2017	341/413	312/412		33.26%	1.09[1.02,1.17]
Oldridge 1983	34/63	24/57		6.41%	1.28[0.88,1.87]
Pack 2013	27/74	22/74		4.6%	1.23[0.77,1.95]
Subtotal (95% CI)	**626**	**593**		**56.63%**	**1.09[1.02,1.17]**
Total events: 440 (Intervention), 385 (Control)					
Heterogeneity: Tau^2=0; Chi^2=1.29, df=4(P=0.86); I^2=0%					
Test for overall effect: Z=2.65(P=0.01)					
1.25.2 at least some unsupervised					
Focht 2004	65/68	68/74		31.17%	1.04[0.96,1.13]
Grace 2016	20/55	10/29		2.76%	1.05[0.57,1.94]
Varnfield 2014	48/60	28/60		9.44%	1.71[1.27,2.31]
Subtotal (95% CI)	**183**	**163**		**43.37%**	**1.24[0.75,2.07]**
Total events: 133 (Intervention), 106 (Control)					
Heterogeneity: Tau^2=0.17; Chi^2=18.75, df=2(P<0.0001); I^2=89.33%					
Test for overall effect: Z=0.84(P=0.4)					
Total (95% CI)	**809**	**756**		**100%**	**1.13[1.02,1.25]**
Total events: 573 (Intervention), 491 (Control)					
Heterogeneity: Tau^2=0.01; Chi^2=13.3, df=7(P=0.07); I^2=47.37%					
Test for overall effect: Z=2.25(P=0.02)					
Test for subgroup differences: Chi^2=0.24, df=1 (P=0.62), I^2=0%					

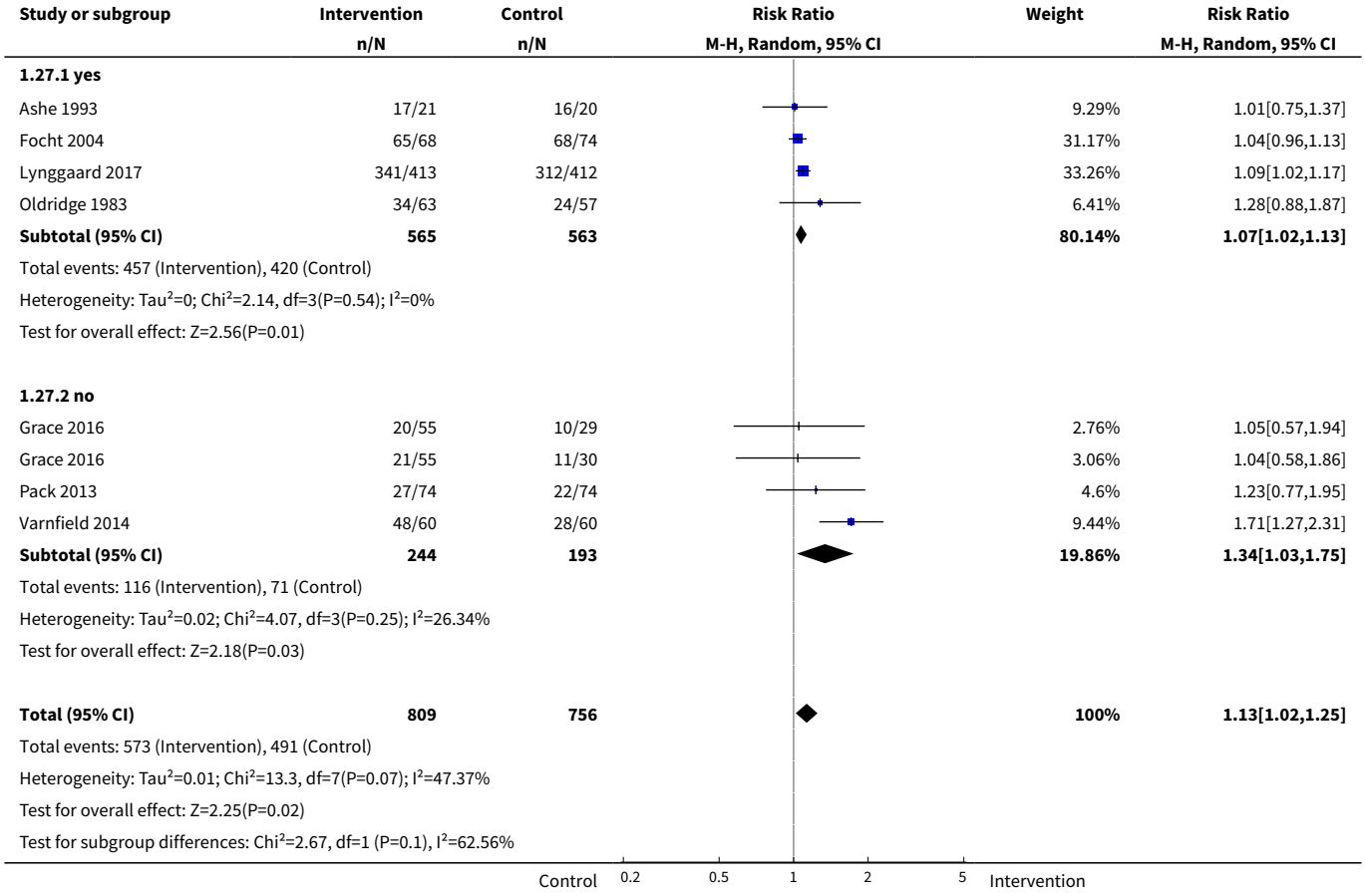
Analysis 1.26. Comparison 1 CR utilisation, Outcome 26 Completion - delivery format.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.26.1 any face-to-face					
Ashe 1993	17/21	16/20		9.29%	1.01[0.75,1.37]
Focht 2004	65/68	68/74		31.17%	1.04[0.96,1.13]
Lynggaard 2017	341/413	312/412		33.26%	1.09[1.02,1.17]
Oldridge 1983	34/63	24/57		6.41%	1.28[0.88,1.87]
Subtotal (95% CI)	**565**	**563**		**80.14%**	**1.07[1.02,1.13]**
Total events: 457 (Intervention), 420 (Control)					
Heterogeneity: Tau^2=0; Chi^2=2.14, df=3(P=0.54); I^2=0%					
Test for overall effect: Z=2.56(P=0.01)					
1.26.2 no face-to-face					
Grace 2016	21/55	11/30		3.06%	1.04[0.58,1.86]
Grace 2016	20/55	10/29		2.76%	1.05[0.57,1.94]
Pack 2013	27/74	22/74		4.6%	1.23[0.77,1.95]
Varnfield 2014	48/60	28/60		9.44%	1.71[1.27,2.31]
Subtotal (95% CI)	**244**	**193**		**19.86%**	**1.34[1.03,1.75]**
Total events: 116 (Intervention), 71 (Control)					

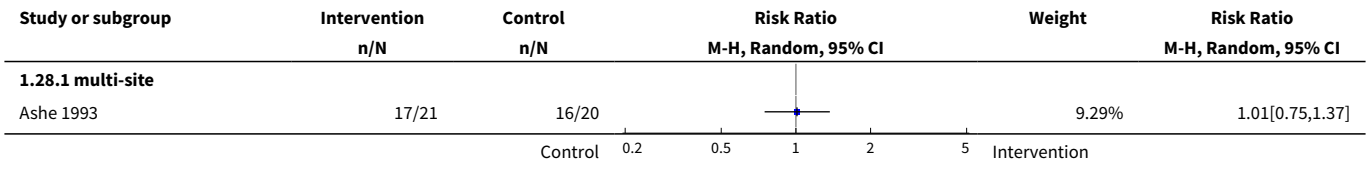


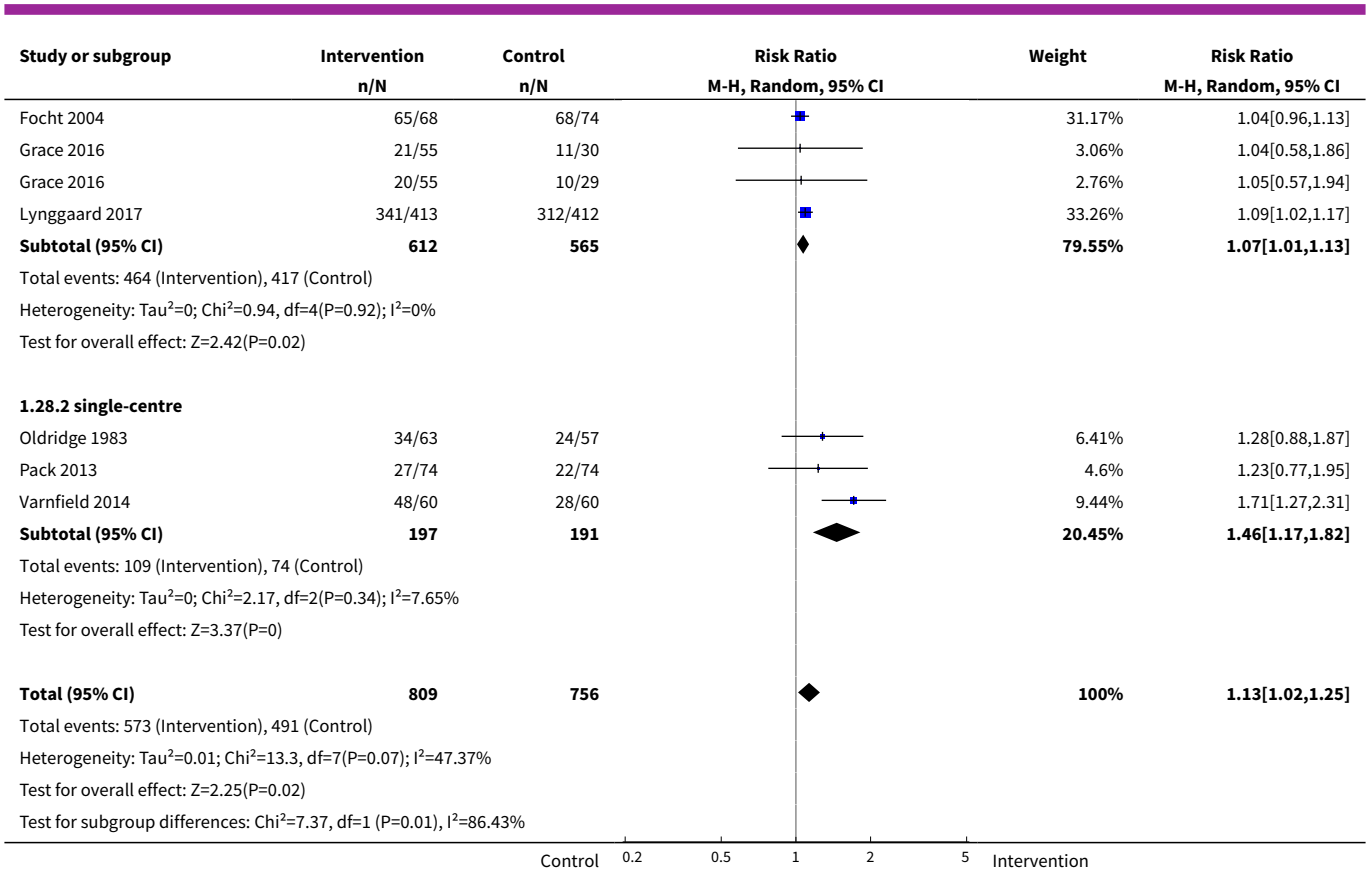


Analysis 1.27. Comparison 1 CR utilisation, Outcome 27 Completion - theory-based.

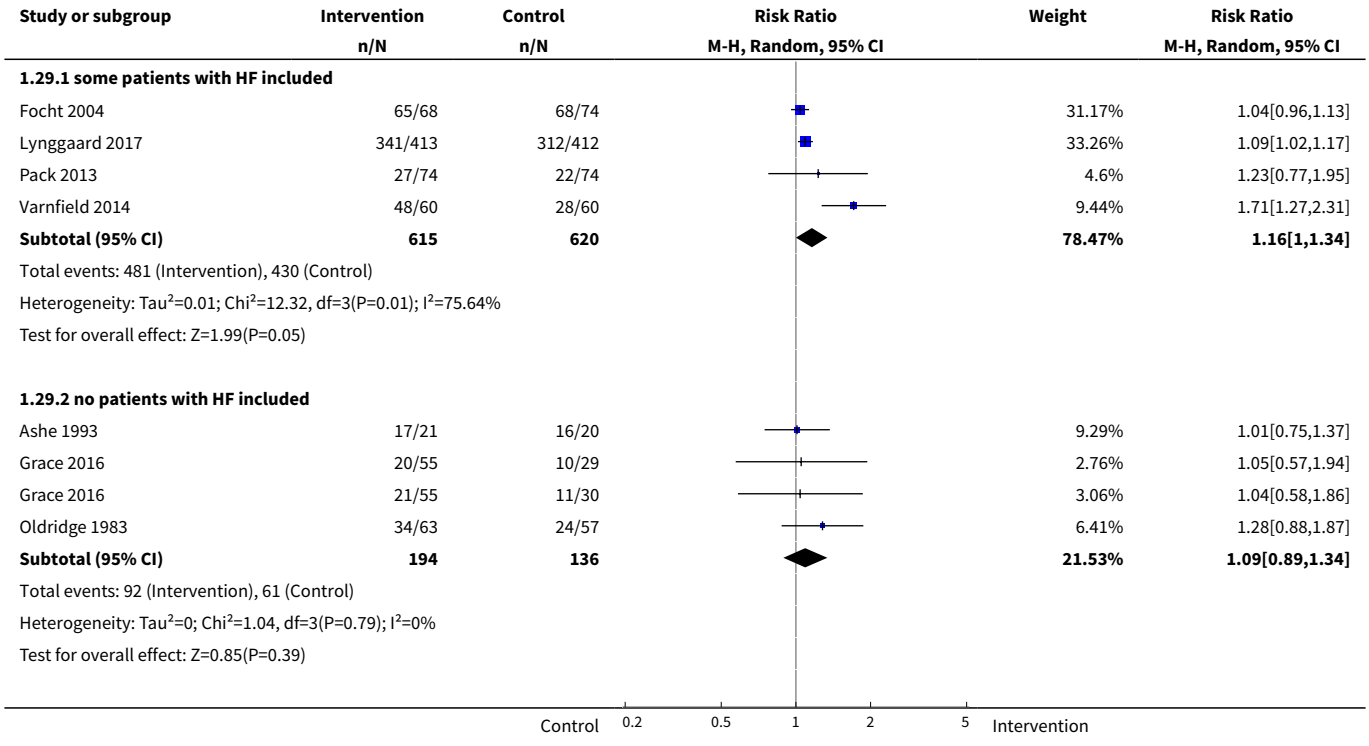


Analysis 1.28. Comparison 1 CR utilisation, Outcome 28 Completion - number of sites.

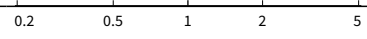




Analysis 1.29. Comparison 1 CR utilisation, Outcome 29 Completion - cardiac indication.

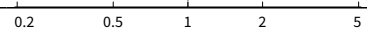


Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Total (95% CI)	**809**	**756**		**100%**	**1.13[1.02,1.25]**
Total events: 573 (Intervention), 491 (Control)					
Heterogeneity: Tau^2=0.01; Chi^2=13.3, df=7(P=0.07); I^2=47.37%					
Test for overall effect: Z=2.25(P=0.02)					
Test for subgroup differences: Chi^2=0.2, df=1 (P=0.65), I^2=0%					



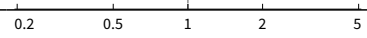
Analysis 1.30. Comparison 1 CR utilisation, Outcome 30 Completion - region.

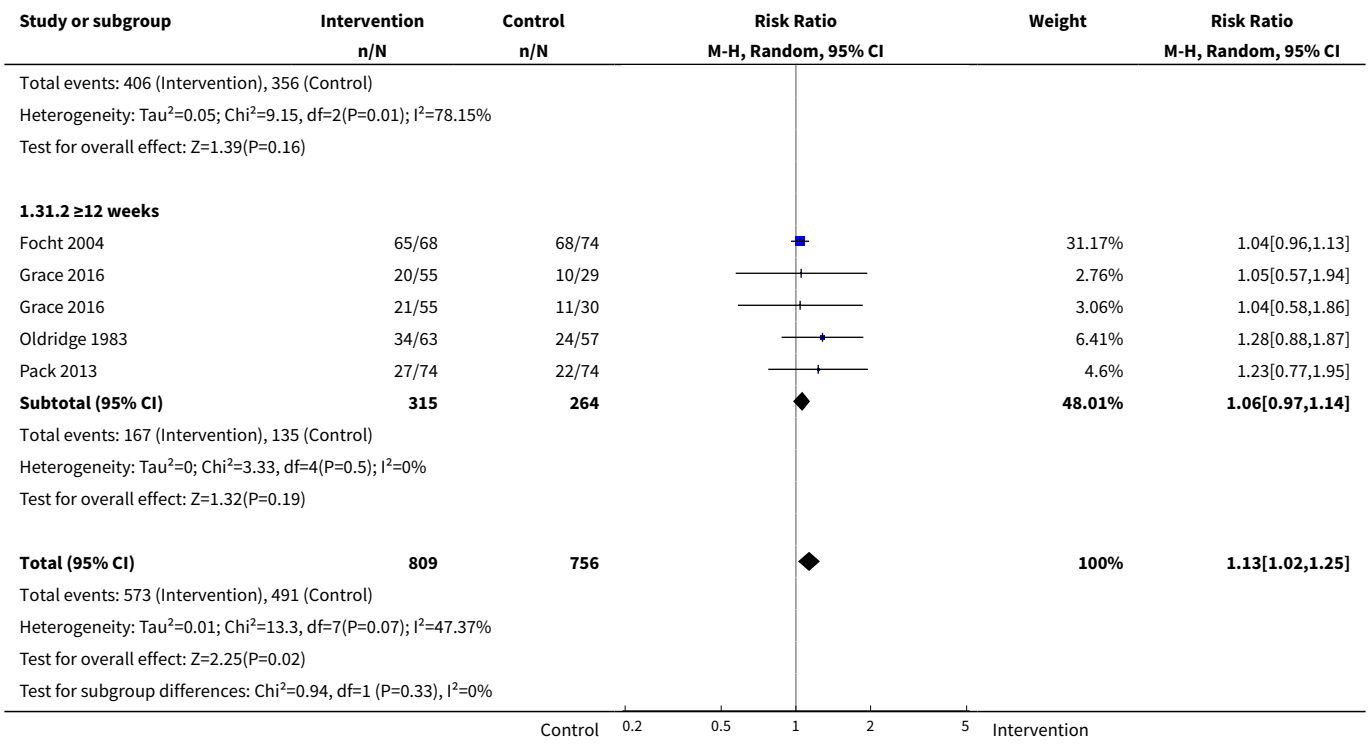
Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.30.1 North America					
Ashe 1993	17/21	16/20		9.29%	1.01[0.75,1.37]
Focht 2004	65/68	68/74		31.17%	1.04[0.96,1.13]
Grace 2016	20/55	10/29		2.76%	1.05[0.57,1.94]
Grace 2016	21/55	11/30		3.06%	1.04[0.58,1.86]
Oldridge 1983	34/63	24/57		6.41%	1.28[0.88,1.87]
Pack 2013	27/74	22/74		4.6%	1.23[0.77,1.95]
Subtotal (95% CI)	**336**	**284**		**57.3%**	**1.05[0.97,1.14]**
Total events: 184 (Intervention), 151 (Control)					
Heterogeneity: Tau^2=0; Chi^2=3.06, df=5(P=0.69); I^2=0%					
Test for overall effect: Z=1.3(P=0.19)					
1.30.2 other					
Lynggaard 2017	341/413	312/412		33.26%	1.09[1.02,1.17]
Varnfield 2014	48/60	28/60		9.44%	1.71[1.27,2.31]
Subtotal (95% CI)	**473**	**472**		**42.7%**	**1.34[0.85,2.1]**
Total events: 389 (Intervention), 340 (Control)					
Heterogeneity: Tau^2=0.1; Chi^2=8.76, df=1(P=0); I^2=88.59%					
Test for overall effect: Z=1.26(P=0.21)					
Total (95% CI)	**809**	**756**		**100%**	**1.13[1.02,1.25]**
Total events: 573 (Intervention), 491 (Control)					
Heterogeneity: Tau^2=0.01; Chi^2=13.3, df=7(P=0.07); I^2=47.37%					
Test for overall effect: Z=2.25(P=0.02)					
Test for subgroup differences: Chi^2=1.04, df=1 (P=0.31), I^2=3.89%					



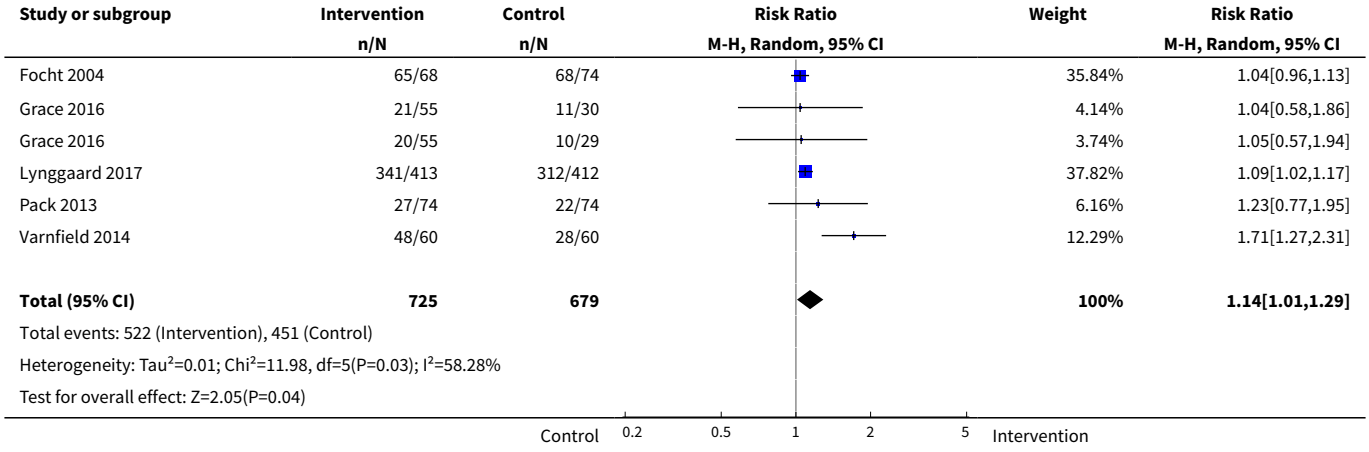
Analysis 1.31. Comparison 1 CR utilisation, Outcome 31 Completion - CR programme duration.

Study or subgroup	Intervention n/N	Control n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
1.31.1 <12 weeks					
Ashe 1993	17/21	16/20		9.29%	1.01[0.75,1.37]
Lynggaard 2017	341/413	312/412		33.26%	1.09[1.02,1.17]
Varnfield 2014	48/60	28/60		9.44%	1.71[1.27,2.31]
Subtotal (95% CI)	**494**	**492**		**51.99%**	**1.22[0.92,1.6]**





Analysis 1.32. Comparison 1 CR utilisation, Outcome 32 Completion - sensitivity analysis - low risk of bias studies.



ADDITIONAL TABLES

Table 1. Meta-regression results

Outcome	Subgroup	Number of participants	Odds ratio (95% CI)	P	Residual I^2

Table 1. Meta-regression results *(Continued)*

Enrol-ment					
	Delivery format (any face-to-face or no face-to-face)	3096	0.73 (0.57 to 0.93)	0.01	37%
	Theory-based (yes or no)	3096	0.98 (0.75 to 1.27)	0.86	60%
	Outcome ascertainment (self-report or chart report)	1835	0.99 (0.99 to 1.00)	0.74	53%
	Number of sites (multi-site or single-centre)	943	0.90 (0.69 to 1.17)	0.40	60%
	Country (North America or other)	3096	0.91 (0.70 to 1.17)	0.44	60%
	Intervention intensity (< 5 contacts or ≥ 5 contacts)	2659	0.99 (0.99 to 1.00)	0.23	66%
	Peer navigation (yes or no)	3096	0.74 (0.50 to 1.10)	0.13	55%
	Intervention deliverer (nurse or allied healthcare professional or no one)	3096	0.73 (0.56 to 0.94)	0.02	37%
	Intervention target (patient or other)	3096	1.49 (0.98 to 2.28)	0.06	46%
	Cardiac indication (heart failure included or not)	2196	0.83 (0.63 to 1.10)	0.19	55%
	CR setting (supervised or unsupervised)	1650	1.03 (0.84 to 1.26)	0.76	15%

APPENDICES

Appendix 1. Search strategies 2018

CENTRAL

#1 MESH DESCRIPTOR Myocardial Ischemia EXPLODE ALL

#2 myocard NEAR3 (ischemi* OR ischaemi*)*

#3 (ischemi OR ischaemi*) NEAR3 heart*

#4 MESH DESCRIPTOR Coronary Artery Bypass EXPLODE ALL

*#5 coronary NEAR3 bypass**

*#6 heart NEAR3 bypass**

#7 MESH DESCRIPTOR Coronary Disease EXPLODE ALL

#8 MESH DESCRIPTOR Myocardial Revascularization EXPLODE ALL

#9 MESH DESCRIPTOR Myocardial Infarction EXPLODE ALL

#10 myocard NEAR3 infarct**

*#11 heart NEAR3 infarct**

#12 cardia NEAR3 infarct**

*#13 acute NEAR3 infarct**

#14 ami

#15 angina

#16 MESH DESCRIPTOR Angina Pectoris EXPLODE ALL

#17 MESH DESCRIPTOR Heart Failure EXPLODE ALL

#18 ((cardiac or myocardial) NEAR1 (failure or insufficiency))

#19 heart NEAR3 (failure or attack)

#20 MESH DESCRIPTOR Percutaneous Coronary Intervention EXPLODE ALL

#21 cabg

#22 ptca

#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 OR #21 OR #22

#24 MESH DESCRIPTOR Patient Compliance EXPLODE ALL

#25 increase NEAR10 participat**

#26 comply

*#27 remain**

#28 adhere OR nonadhere**

#29 uptake

#30 sign NEAR2 (up OR on)

*#31 effectiv**

#32 "follow up"

*#33 engage**

*#34 attend**

#35 #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34

#36 MESH DESCRIPTOR Rehabilitation Centers

#37 MESH DESCRIPTOR Rehabilitation EXPLODE ALL

*#38 rehabilitat**

#39 MESH DESCRIPTOR Sports

#40 MESH DESCRIPTOR Physical Exertion EXPLODE ALL

#41 MESH DESCRIPTOR Exercise EXPLODE ALL

#42 (physical NEAR3 (fit* OR train* OR therap* OR activit*))*

*#43 physiotherap**

#44 (train NEAR3 (strength* OR aerobic OR exercise*))*

#45 ((exercise OR fitness) NEAR3 (treatment OR intervent* OR program*))*

#46 MESH DESCRIPTOR Patient Education as Topic EXPLODE ALL

#47 (patient NEAR3 educat*)*

#48 ((lifestyle OR "life-style") NEAR3 (intervent OR program* OR treatment*))*

#49 MESH DESCRIPTOR Health Education EXPLODE ALL

#50 ((nutrition OR diet OR health) NEAR3 education)

#51 MESH DESCRIPTOR Self Care EXPLODE ALL

#52 (self NEAR3 (manage OR care))*

#53 MESH DESCRIPTOR Motivation EXPLODE ALL

*#54 motivat**

#55 "heart manual"

#56 MESH DESCRIPTOR Ambulatory Care EXPLODE ALL

#57 MESH DESCRIPTOR Psychotherapy EXPLODE ALL

*#58 psychotherap**

#59 psycholog NEAR3 intervent**

#60 MESH DESCRIPTOR Mind-Body Therapies EXPLODE ALL

*#61 relax**

*#62 meditat**

*#63 autogenic**

*#64 hypnotherap**

#65 MESH DESCRIPTOR Counseling EXPLODE ALL

#66 counseling OR counselling

#67 MESH DESCRIPTOR Behavior Therapy EXPLODE ALL

#68 (behavior OR behaviour*) NEAR4 (modif* OR therap* OR rehab* OR change)*

#69 cogniti NEAR3 therap**

#70 cbt

#71 MESH DESCRIPTOR Stress, Psychological EXPLODE ALL

#72 (stress NEAR3 manage)*

#73 MESH DESCRIPTOR Anxiety

#74 manage NEAR3 (anxiety OR depres*)*

#75 goal NEAR3 setting

#76 "psycho-educat"*

#77 motivat NEAR3 interv**

#78 MESH DESCRIPTOR Psychopathology EXPLODE ALL

*#79 psychopathol**

*#80 distress**

#81 psychosocial OR "psycho-social*"*

#82 secondary NEAR5 prevent NEAR10 (intervent* OR program* OR treatment* OR plan* OR regimen*)*

#83 #82 OR #81 OR #80 OR #79 OR #78 OR #77 OR #76 OR #75 OR #74 OR #73 OR #72 OR #71 OR #70 OR #69 OR #68 OR #67 OR #66 OR #65 OR #64 OR #63 OR #62 OR #61 OR #60 OR #59 OR #58 OR #57 OR #56 OR #55 OR #54 OR #53 OR #52 OR #51 OR #50 OR #49 OR #48 OR #47 OR #46 OR #45 OR #44 OR #43 OR #42 OR #41 OR #40 OR #39 OR #38 OR #37 OR #36

#84 MESH DESCRIPTOR Heart Diseases EXPLODE ALL WITH QUALIFIER RH

#85 #83 AND #23

#86 #84 OR #85

#87 #86 AND #35

#88 #87 Publication Year from 2013 to 2018

MEDLINE Ovid

1 exp Myocardial Ischemia/

2 (myocard adj3 isch?emi*).tw.*

3 (isch?emi adj3 heart).tw.*

4 exp Coronary Artery Bypass/

5 coronary.tw.

6 (heart adj3 bypass).tw.*

7 exp Coronary Disease/

8 exp Myocardial Revascularization/

9 exp Myocardial Infarction/

10 (myocard adj3 infarct*).tw.*

11 (heart adj3 infarct).tw.*

12 (cardia adj3 infarct*).tw.*

13 (acute adj3 infarct).tw.*

14 AMI.tw.

15 exp Angina Pectoris/

16 angina.tw.

17 exp Heart Failure/

18 ((cardiac or myocardial) adj (failure or insufficiency)).tw.

19 (heart adj3 (failure or attack)).tw.

20 exp Percutaneous Coronary Intervention/

21 CABG.tw.

22 (PTCA or PCI).tw.

23 or/1-22

24 Patient Compliance/

25 (increase adj10 participat*).tw.*

26 (comply or complian or noncomplian*).tw.*

27 remain.tw.*

28 (adhere or nonadhere*).tw.*

29 (uptake or take up).tw.

30 (sign adj2 (up or on)).tw.

31 effectiv.tw.*

32 follow up.tw.

33 engage.tw.*

34 attend.tw.*

35 or/24-34

36 Rehabilitation Centers/

37 exp Rehabilitation/

38 rehabilitat.tw.*

39 Sports/

40 exp Physical Exertion/

41 exp Exercise/

42 (physical adj3 (fit* or train* or therap* or activit*)).tw.*

43 physiotherap.tw.*

44 (train adj3 (strength* or aerobic or exercise*)).tw.*

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

46 exp Patient Education as Topic/

47 (patient adj3 educat*).tw.*

48 ((lifestyle or life-style) adj3 (intervent or program* or treatment*)).tw.*

49 exp Health Education/

50 ((nutrition or diet or health) adj3 education).tw.

51 exp Self Care/

52 (self adj3 (manage or care)).tw.*

53 exp Motivation/

54 motivat.tw.*

55 heart manual.tw.

56 exp Ambulatory Care/

57 exp Psychotherapy/

58 psychotherap.tw.*

59 (psycholog adj3 intervent*).tw.*

60 exp Mind-Body Therapies/

61 relax.tw.*

62 meditat.tw.*

63 autogenic.tw.*

64 hypnotherap.tw.*

65 exp Counseling/

66 counsel?ing.tw.

67 exp Behavior Therapy/

68 (behavio?r adj4 (modif* or therap* or rehab* or change)).tw.*

69 (cogniti adj3 therap*).tw.*

70 CBT.tw.

71 exp Stress, Psychological/

72 (stress adj3 manage).tw.*

73 Anxiety/

74 (manage adj3 (anxiety or depres*)).tw.*

75 (goal adj3 setting).tw.

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

77 (motivat adj3 interv*).tw.*

78 exp Psychopathology/

79 psychopathol.tw.*

80 distress.tw.*

81 (psychosocial or psycho-social*).tw.*

82 (secondary adj5 prevent adj10 (intervent* or program* or treatment* or plan* or regimen*)).tw.*

83 or/36-82

84 Cardiac Rehabilitation/

85 exp Heart Diseases/rh [Rehabilitation]

86 84 or 85

87 23 and 83

88 86 or 87

89 35 and 88

90 randomized controlled trial.pt.

91 controlled clinical trial.pt.

92 randomized.ab.

93 placebo.ab.

94 drug therapy.fs.

95 randomly.ab.

96 trial.ab.

97 groups.ab.

98 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97

99 exp animals/ not humans.sh.

100 98 not 99

101 89 and 100

102 limit 101 to ed=20130101-20180710

Embase Elsevier (2013 to April 2017)

1. 'heart muscle ischemia'/exp
2. (myocard* NEAR/3 isch*emi*):ab,ti
3. (isch*emi* NEAR/3 heart):ab,ti
4. 'coronary artery bypass graft'/de
5. (coronary NEAR/3 bypass*):ab,ti
6. (heart NEAR/3 bypass*):ab,ti
7. 'coronary artery disease'/exp
8. 'heart muscle revascularization'/de
9. 'heart infarction'/exp
10. (myocard* NEAR/3 infarct*):ab,ti
11. (heart NEAR/3 infarct*):ab,ti
12. (cardia* NEAR/3 infarct*):ab,ti
13. (acute NEAR/3 infarct*):ab,ti
14. ami:ab,ti
15. 'angina pectoris'/exp
16. angina:ab,ti
17. 'heart failure'/exp
18. ((cardiac OR myocardial) NEAR/1 (failure OR insufficiency)):ab,ti
19. (heart NEAR/3 (failure OR attack)):ab,ti
20. 'percutaneous coronary intervention'/exp
21. cabg:ab,ti
22. ptca:ab,ti OR pci:ab,ti
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 OR #21 OR #22
24. 'patient compliance'/de
25. (increase* NEAR/10 participat*):ab,ti
26. comply:ab,ti OR complian*:ab,ti OR noncomplian*:ab,ti
27. remain*:ab,ti
28. adhere*:ab,ti OR nonadhere*:ab,ti
29. uptake:ab,ti OR 'take up':ab,ti
30. (sign NEAR/2 (up OR on)):ab,ti.
31. effectiv*:ab,ti
32. 'follow up':ab,ti

33. engage*:ab,ti
34. attend*:ab,ti
35. #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34
36. 'rehabilitation center'/de
37. 'rehabilitation'/exp
38. rehabilitat*:ab,ti
39. 'sport'/de
40. 'exercise'/exp
41. (physical* NEAR/3 (fit* OR train* OR therap* OR activit*)):ab,ti
42. physiotherap*:ab,ti
43. (train* NEAR/3 (strength* OR aerobic OR exercise*)):ab,ti
44. ((exercise* OR fitness) NEAR/3 (treatment OR intervent* OR program*)):ab,ti
45. 'patient education'/de
46. (patient* NEAR/3 educat*):ab,ti
47. ((lifestyle OR 'life-style') NEAR/3 (intervent* OR program* OR treatment*)):ab,ti
48. 'health education'/exp
49. ((nutrition OR diet OR health) NEAR/3 education):ab,ti
50. 'self care'/exp
51. (self NEAR/3 (manage* OR care)):ab,ti
52. 'motivation'/de
53. motivat*:ab,ti
54. motivat*:ab,ti
55. 'ambulatory care'/exp
56. 'psychotherapy'/exp
57. psychotherap*:ab,ti
58. (psycholog* NEAR/3 intervent*):ab,ti
59. 'alternative medicine'/exp
60. relax*:ab,ti
61. meditat*:ab,ti
62. autogenic*:ab,ti
63. hypnotherap*:ab,ti
64. 'counseling'/exp
65. counsel*ing:ab,ti
66. 'behavior therapy'/exp
67. (behavio*r* NEAR/4 (modif* OR therap* OR rehab* OR change)):ab,ti
68. (cogniti* NEAR/3 therap*):ab,ti
69. cbt:ab,ti
70. 'mental stress'/de
71. (stress NEAR/3 manage*):ab,ti
72. 'anxiety'/de
73. (manage* NEAR/3 (anxiety OR depres*)):ab,ti
74. (goal NEAR/3 setting):ab,ti
75. 'psycho-educat*':ab,ti OR psychoeducat*:ab,ti
76. (motivat* NEAR/3 interv*):ab,ti
77. psychopathol*:ab,ti
78. distress*:ab,ti
79. psychosocial*:ab,ti OR 'psycho-social*':ab,ti
80. (secondary NEAR/5 prevent* NEAR/10 (intervent* OR program* OR treatment* OR plan* OR regimen*)):ab,ti
81. #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 OR #53OR #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 OR #68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #79 OR #80
82. 'heart rehabilitation'/de
83. 'heart disease'/exp/dm_rh
84. #82 OR #83
85. #23 AND #81
86. #84 OR #85
87. #35 AND #86
88. random*:ab,ti OR placebo* OR (double NEXT/1 blind*):ab,ti
89. #87 AND #88 AND [1-1-2013]/sd NOT [23-4-2017]/sd
90. #89 AND [embase]/lim NOT [medline]/lim

Embase Ovid (April 2017 to July 2018)

1 exp heart muscle ischemia/

2 (myocard adj3 isch?emi*).tw.*

3 (isch?emi adj3 heart).tw.*

4 exp coronary artery bypass graft/

5 (coronary adj3 bypass).tw.*

6 (heart adj3 bypass).tw.*

7 exp coronary artery disease/

8 exp heart muscle revascularization/

9 exp heart infarction/

10 (myocard adj3 infarct*).tw.*

11 (heart adj3 infarct).tw.*

12 (cardia adj3 infarct*).tw.*

13 (acute adj3 infarct).tw.*

14 AMI.tw.

15 exp angina pectoris/

16 angina.tw.

17 exp heart failure/

18 ((cardiac or myocardial) adj (failure or insufficiency)).tw.

19 (heart adj3 (failure or attack)).tw.

20 exp percutaneous coronary intervention/

21 CABG.tw.

22 (PTCA or PCI).tw.

23 or/1-22

24 patient compliance/

25 (increase adj10 participat*).tw.*

26 (comply or complian or noncomplian*).tw.*

27 remain.tw.*

28 (adhere or nonadhere*).tw.*

29 (uptake or take up).tw.

30 (sign adj2 (up or on)).tw.

31 effectiv.tw.*

32 follow up.tw.

33 engage.tw.*

34 attend.tw.*

35 or/24-34

36 rehabilitation center/

37 exp rehabilitation/

38 rehabilitat.tw.*

39 sport/

40 exp exercise/

41 (physical adj3 (fit* or train* or therap* or activit*)).tw.*

42 physiotherap.tw.*

43 (train adj3 (strength* or aerobic or exercise*)).tw.*

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

45 patient education/

46 (patient adj3 educat*).tw.*

47 ((lifestyle or life-style) adj3 (intervent or program* or treatment*)).tw.*

48 exp health education/

49 ((nutrition or diet or health) adj3 education).tw.

50 exp self care/

51 (self adj3 (manage or care)).tw.*

52 exp motivation/

53 motivat.tw.*

54 heart manual.tw.

55 exp ambulatory care/

56 exp psychotherapy/

57 psychotherap.tw.*

58 (psycholog adj3 intervent*).tw.*

59 exp alternative medicine/

60 relax.tw.*

61 meditat.tw.*

62 autogenic.tw.*

63 hypnotherap.tw.*

64 exp counseling/

65 counsel?ing.tw.

66 exp behavior therapy/

67 (behavio?r adj4 (modif* or therap* or rehab* or change)).tw.*

68 (cogniti adj3 therap*).tw.*

69 CBT.tw.

70 mental stress/

71 (stress adj3 manage).tw.*

72 anxiety/

73 (manage adj3 (anxiety or depres*)).tw.*

74 (goal adj3 setting).tw.

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

76 (motivat adj3 interv*).tw.*

77 psychopathol.tw.*

78 distress.tw.*

79 (psychosocial or psycho-social*).tw.*

80 (secondary adj5 prevent adj10 (intervent* or program* or treatment* or plan* or regimen*)).tw.*

81 or/36-80

82 heart rehabilitation/

83 exp heart disease/rh [Rehabilitation]

84 82 or 83

85 23 and 81

86 84 or 85

87 35 and 86

88 random$.tw.

89 factorial$.tw.

90 crossover$.tw.

91 cross over$.tw.

92 cross-over$.tw.

93 placebo$.tw.

94 (doubl$ adj blind$).tw.

95 (singl$ adj blind$).tw.

96 assign$.tw.

97 allocat$.tw.

98 volunteer$.tw.

99 crossover procedure/

100 double blind procedure/

101 randomized controlled trial/

102 single blind procedure/

103 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

104 (animal/ or nonhuman/) not human/

105 103 not 104

106 87 and 105

107 limit 106 to embase

108 limit 107 to em=201714-201828

CINAHL

S95 S94 AND EM 201301-

S94 S89 AND S93

S93 S90 OR S91 OR S92

S92 PT clinical trial

S91 (MH "Treatment Outcomes")

S90 TI randomized or AB randomized

S89 S35 AND S88

S88 S86 OR S87

S87 S23 AND S83

S86 S84 AND S85

S85 (MH "Heart Diseases+/RH")

S84 (MH "Rehabilitation, Cardiac+")

S83 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 OR S52 OR 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 OR S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82

S82 TI ((secondary N5 prevent* N10 (intervent* or program* or treatment* or plan* or regimen*))) OR AB ((secondary N5 prevent* N10 (intervent* or program* or treatment* or plan* or regimen*)))

S81 TI ((psychosocial* or "psycho-social*")) OR AB ((psychosocial* or "psycho-social*"))

S80 TI distress* OR AB distress*

S79 TI psychopathol* OR AB psychopathol*

S78 (MH "Psychopathology")

S77 TI (motivat* N3 interv*) OR AB (motivat* N3 interv*)

S76 TI ((psycho-educat* or psychoeducat*)) OR AB ((psycho-educat* or psychoeducat*))

S75 TI (goal N3 setting) OR AB (goal N3 setting)

S74 TI ((manage* N3 (anxiety or depres*))) OR AB ((manage* N3 (anxiety or depres*)))

S73 (MH "Anxiety+")

S72 TI (stress N3 manage*) OR AB (stress N3 manage*)

S71 (MH "Stress, Psychological+")

S70 TI CBT OR AB CBT

S69 TI (cogniti* N3 therap*) OR AB (cogniti* N3 therap*)

S68 TI ((behavio#r* N4 (modif* or therap* or rehab* or change))) OR AB ((behavio#r* N4 (modif* or therap* or rehab* or change)))

S67 (MH "Behavior Therapy+")

S66 TI counsel#ing OR AB counsel#ing

S65 (MH "Counseling+")

S64 TI hypnotherap* OR AB hypnotherap*

S63 TI autogenic* OR AB autogenic*

S62 TI meditat* OR AB meditat*

S61 TI relax* OR AB relax*

S60 (MH "Mind Body Techniques+")

S59 TI (psycholog* N3 intervent*) OR AB (psycholog* N3 intervent*)

S58 TI psychotherap* OR AB psychotherap*

S57 (MH "Psychotherapy+")

S56 (hypnotherap* (MH "Ambulatory Care"))

S55 TI "heart manual" OR AB "heart manual"

S54 TI motivat* OR AB motivat*

S53 (MH "Motivation+")

S52 TI ((self N3 (manage* or care))) OR AB ((self N3 (manage* or care)))

S51 (MH "Self Care")

S50 TI (((nutrition or diet or health) N3 education)) OR AB (((nutrition or diet or health) N3 education))

S49 (MH "Health Education") OR (MH "Nutrition Education")

S48 TI (((lifestyle or "life-style") N3 (intervent* or program* or treatment*))) OR AB (((lifestyle or "life-style") N3 (intervent* or program* or treatment*)))

S47 TI (patient* N3 educat*) OR AB (patient* N3 educat*)

S46 (MH "Patient Education") OR (MH "Patient Discharge Education")

S45 TI (((exercise* or fitness) N3 (treatment or intervent* or program*))) OR AB (((exercise* or fitness) N3 (treatment or intervent* or program*)))

S44 TI ((train* N3 (strength* or aerobic or exercise*))) OR AB ((train* N3 (strength* or aerobic or exercise*)))

S43 TI physiotherap* OR AB physiotherap*

S42 TI ((physical* N3 (fit* or train* or therap* or activit*))) OR AB ((physical* N3 (fit* or train* or therap* or activit*)))

S41 (MH "Physical Activity")

S40 (MH "Exertion+")

S39 (MH "Sports")

S38 TI rehabilitat* OR AB rehabilitat*

S37 (MH "Rehabilitation+")

S36 (MH "Rehabilitation Centers")

S35 S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34

S34 TI attend* OR AB attend*

S33 TI engage* OR AB engage*

S32 TI "follow up" OR AB "follow up"

S31 TI effectiv* OR AB effectiv*

S30 TI ((sign N2 (up or on))) OR AB ((sign N2 (up or on)))

S29 TI ((uptake or "take up")) OR AB ((uptake or "take up"))

S28 TI ((adhere* or nonadhere*)) OR AB ((adhere* or nonadhere*))

S27 TI remain* OR AB remain*

S26 TI ((comply or complian* or noncomplian*)) OR AB ((comply or complian* or noncomplian*))

S25 TI (increase* N10 participat*) OR AB (increase* N10 participat*)

S24 (MH "Patient Compliance")

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 TI ((PTCA or PCI)) OR AB ((PTCA or PCI))

S21 TI CABG OR AB CABG

S20 (MH "Angioplasty, Balloon+")

S19 TI ((heart N3 (failure or attack))) OR AB ((heart N3 (failure or attack)))

S18 TI (((cardiac or myocardial) N1 (failure or insufficiency))) OR AB (((cardiac or myocardial) N1 (failure or insufficiency)))

S17 (MH "Heart Failure+")

S16 TI angina OR AB angina

S15 (MH "Angina Pectoris+")

S14 TI (AMI) OR AB (AMI)

S13 TI (acute N3 infarct*) OR AB (acute N3 infarct*)

S12 TI (cardia* N3 infarct*) OR AB (cardia* N3 infarct*)

S11 TI (heart N3 infarct*) OR AB (heart N3 infarct*)

S10 TI (myocard* N3 infarct*) OR AB (myocard* N3 infarct*)

S9 (MH "Myocardial Infarction+")

S8 (MH "Myocardial Revascularization+")

S7 (MH "Coronary Disease+")

S6 TI (heart N3 bypass*) OR AB (heart N3 bypass*)

S5 TI coronary OR AB coronary

S4 (MH "Coronary Artery Bypass+")

S3 TI (isch#emi* N3 heart) OR AB (isch#emi* N3 heart)

S2 TI (myocard* N3 isch#emi*) OR AB (myocard* N3 isch#emi*)

S1 (MH "Myocardial Ischemia+")

CPCI - Science (WoS)

32 #31 Timespan=2013-2018

31 #29 and #30

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

29 #9 and #13 and #28

28 #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27

27 TS=(secondary near/5 prevent* near/10 (intervent* or program* or treatment* or plan* or regimen*))

26 TS=(goal near/3 setting)

25 TS=(manage* near/3 (anxiety or depres* or stress))

24 TS=(cogniti* near/3 therap*)

23 TS=(behavio$r* near/4 (modif* or therap* or rehab* or change))

22 TS=(psycholog* near/3 intervent*)

21 TS=(physiotherap* or "mind body therap*" or motivat* or "heart manual" or "ambulatory care" or psychotherap* or relax* or meditat* or autogenic* or hypnotherap* or counseling or CBT or "psycho-educat*" or psychoeducat* or psychopathol* or distress* or psychosocial* or "psycho-social*")

20 TS=((lifestyle or "life-style") near/3 (intervent* or program* or treatment*))

19 TS=(self near/3 (manage* or care))

18 TS=((patient* or nutrition or diet or health) near/3 education)

17 TS=((exercise* or fitness) near/3 (treatment or intervent* or program*))

16 TS=(train* near/3 (strength* or aerobic or exercise*))

15 TS=(physical* near/3 (fit* or train* or therap* or activit* or exert*))

14 TS=(rehabilitat*)

13 #10 or #11 or #12

12 TS=(sign near/2 (up or on))

11 TS=(comply or complian* or noncomplian* or remain* or adhere* or nonadhere* or uptake or "take up" or effectiv* or "follow up" or engage* or attend*)

10 TS=(increase* near/10 participat*)

9 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8

8 TS=(heart near/3 (failure or attack))

7 TS=((cardiac or myocardial) near/1 (failure or insufficiency))

6 TS=(AMI or angina or CABG or "percutaneous coronary intervention" OR PCI or PTCA or angioplast*)

5 TS=(myocard* near/3 revascularization)

4 TS=((myocard* or heart or cardia* or acute) near/3 infarct*)

3 TS=(heart near/3 bypass*)

2 TS=(coronary)

1 TS=((myocard* or heart) near/3 isch$emi*)

Appendix 2. Search strategies 2013

The Cochrane Library

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

#2 (myocard* near/3 isch?mi*)

#3 (isch?mi* near/3 heart)

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

#5 coronary

#6 MeSH descriptor: [Coronary Disease] explode all trees

#7 MeSH descriptor: [Myocardial Revascularization] explode all trees

#8 MeSH descriptor: [Myocardial Infarction] explode all trees

#9 (myocard* near/3 infarct*)

#10 (heart near/3 infarct*)

#11 MeSH descriptor: [Angina Pectoris] explode all trees

#12 angina

#13 MeSH descriptor: [Heart Failure] explode all trees

#14 (heart near/3 (failure or attack))

#15 MeSH descriptor: [Heart Diseases] explode all trees

#16 (heart near/3 disease*)

#17 myocard*

#18 cardiac*

#19 CABG

#20 PTCA

#21 (stent* near/3 (heart or cardiac*))

#22 MeSH descriptor: [Heart Bypass, Left] explode all trees

#23 MeSH descriptor: [Heart Bypass, Right] explode all trees

#24 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23

#25 MeSH descriptor: [Rehabilitation Centers] this term only

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

#27 MeSH descriptor: [Sports] this term only

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

#29 rehabilitat*

#30 (physical* near/3 (fit* or train* or therap* or activit*))

#31 MeSH descriptor: [Exercise] explode all trees

#32 (train* near/3 (strength* or aerobic or exercise*))

#33 ((exercise* or fitness) near/3 (treatment or intervent* or program*))

#34 MeSH descriptor: [Rehabilitation] explode all trees

#35 MeSH descriptor: [Patient Education as Topic] explode all trees

#36 (patient* near/3 educat*)

#37 ((lifestyle or life-style) near/3 (intervent* or program* or treatment*))

#38 MeSH descriptor: [Self Care] explode all trees

#39 MeSH descriptor: [Ambulatory Care] explode all trees

#40 MeSH descriptor: [Psychotherapy] explode all trees

#41 psychotherap*

#42 (psycholog* near/3 intervent*)

#43 relax*

#44 MeSH descriptor: [Mind-Body Therapies] explode all trees

#45 MeSH descriptor: [Counseling] explode all trees

#46 counsel?ing

#47 MeSH descriptor: [Cognitive Therapy] explode all trees

#48 MeSH descriptor: [Behavior Therapy] explode all trees

#49 (behavio*r* near/4 (modif* or therap* or rehab* or change))

#50 MeSH descriptor: [Stress, Psychological] explode all trees

#51 (stress near/3 manage*)

#52 (cognitive* near/3 therap*)

#53 MeSH descriptor: [Meditation] explode all trees

#54 meditat*

#55 MeSH descriptor: [Anxiety] this term only

#56 (manage* near/3 (anxiety or depres*))

#57 CBT

#58 hypnotherap*

#59 (goal near/3 setting)

#60 (psycho-educat* or psychoeducat*)

#61 (motivat* near/3 interv*)

#62 MeSH descriptor: [Psychopathology] explode all trees

#63 psychopathol*

#64 MeSH descriptor: [Autogenic Training] explode all trees

#65 autogenic*

#66 (self near/3 (manage* or care or motivat*))

#67 distress*

#68 (psychosocial* or psycho-social*)

#69 MeSH descriptor: [Health Education] explode all trees

#70 ((nutrition or diet or health) near/3 education)

#71 heart manual

#72 secondary near/5 prevent* near/10 (intervent* or program* or treatment* or plan* or regimen*)

#73 #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 or #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 or #68 or #69 or #70 or #71 or #72

#74 MeSH descriptor: [Patient Compliance] this term only

#75 (increase* near/10 participat*)

#76 (comply or complian*)

#77 remain*

#78 adhere*

#79 uptake or "take up"

#80 "sign up" or " sign on"

#81 effectiv*

#82 "follow up"

#83 engage*

#84 attend*

#85 #74 or #75 or #76 or #77 or #78 or #79 or #80 or #81 or #82 or #83 or #84

#86 #24 and #73 and #85 from 2008 to 2013

MEDLINE Ovid

1. exp Myocardial Ischemia/

2. (myocard* adj3 isch?mi*).tw.

3. (isch?mi* adj3 heart).tw.

4. exp Coronary Artery Bypass/

5. coronary.tw.

6. exp Coronary Disease/

7. exp Myocardial Revascularization/

8. exp Myocardial Infarction/

9. (myocard* adj3 infarct*).tw.

10. (heart adj3 infarct*).tw.

11. exp Angina Pectoris/

12. angina.tw.

13. exp Heart Failure/

14. (heart adj3 (failure or attack)).tw.

15. Angioplasty, Balloon, Coronary/

16. CABG.tw.

17. PTCA.tw.

18. ami.tw.

19. (cardia* adj3 infarct*).tw.

20. (acute adj3 infarct*).tw.

21. (heart adj3 bypass*).tw.

22. ((cardiac or mycardial) adj (failure or insufficiency)).tw.

23. or/1-22

24. Patient Compliance/

25. (increase* adj10 participat*).tw.

26. (comply or complian*).tw.

27. remain*.tw.

28. adhere*.tw.

29. (uptake or take up).tw.

30. (sign adj2 (up or on)).tw.

31. effectiv*.tw.

32. follow up.tw.

33. engage*.tw.

34. attend*.tw.

35. or/24-34

36. Rehabilitation Centers/

37. exp Exercise Therapy/

38. Sports/

39. exp Physical Exertion/

40. rehabilitat*.tw.

41. (physical* adj3 (fit* or train* or therap* or activit*)).tw.

42. exp Exercise/

43. (train* adj3 (strength* or aerobic or exercise*)).tw.

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

45. exp Rehabilitation/

46. exp Patient Education as Topic/

47. (patient* adj3 educat*).tw.

48. ((lifestyle or life-style) adj3 (intervent* or program* or treatment*)).tw.

49. exp Self Care/

50. exp Ambulatory Care/

51. exp Psychotherapy/

52. psychotherap*.tw.

53. (psycholog* adj3 intervent*).tw.

54. relax*.tw.

55. exp Mind-Body Therapies/

56. exp Counseling/

57. counsel?ing.tw.

58. exp Cognitive Therapy/

59. exp Behavior Therapy/

60. (behavio*r* adj4 (modif* or therap* or rehab* or change)).tw.

61. exp Stress, Psychological/

62. (stress adj3 manage*).tw.

63. (cognitive* adj3 therap*).tw.

64. exp Meditation/

65. meditat*.tw.

66. Anxiety/

67. (manage* adj3 (anxiety or depres*)).tw.

68. CBT.tw.

69. hypnotherap*.tw.

70. (goal adj3 setting).tw.

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

72. (motivat* adj3 interv*).tw.

73. exp Psychopathology/

74. psychopathol*.tw.

75. exp Autogenic Training/

76. autogenic*.tw.

77. (self adj3 (manage* or care or motivat*)).tw.

78. distress*.tw.

79. (psychosocial* or psycho-social*).tw.

80. exp Health Education/

81. ((nutrition or diet or health) adj3 education).tw.

82. heart manual.tw.

83. (secondary adj5 prevent$ adj10 (intervent* or program* or treatment* or plan* or regimen*)).tw.

84. or/36-83

85. 23 and 35 and 84

86. randomised controlled trial.pt.

87. controlled clinical trial.pt.

88. randomized.ab.

89. placebo.ab.

90. drug therapy.fs.

91. randomly.ab.

92. trial.ab.

93. groups.ab.

94. 86 or 87 or 88 or 89 or 90 or 91 or 92 or 93

95. exp animals/ not humans.sh.

96. 94 not 95

97. 85 and 96

98. (2008* or 2009* or 2010* or 2011* or 2012* or 2013*).ed.

99. 97 and 98

Embase Ovid

1. exp Myocardial Ischemia/

2. (myocard* adj3 isch?mi*).tw.

3. (isch?mi* adj3 heart).tw.

4. exp Coronary Artery Bypass/

5. coronary.tw.

6. exp Coronary Disease/

7. exp Myocardial Revascularization/

8. exp Myocardial Infarction/

9. (myocard* adj3 infarct*).tw.

10. (heart adj3 infarct*).tw.

11. exp Angina Pectoris/

12. angina.tw.

13. exp Heart Failure/

14. (heart adj3 (failure or attack)).tw.

15. exp Heart Diseases/

16. (heart adj3 disease*).tw.

17. myocard*.tw.

18. cardiac*.tw.

19. CABG.tw.

20. PTCA.tw.

21. (stent* adj3 (heart or cardiac*)).tw.

22. exp Heart Bypass, Left/

23. exp Heart Bypass, Right/

24. or/1-23

25. Rehabilitation Centers/

26. exp Exercise Therapy/

27. Sports/

28. exp Physical Exertion/

29. rehabilitat*.tw.

30. (physical* adj3 (fit* or train* or therap* or activit*)).tw.

31. exp Exercise/

32. (train* adj3 (strength* or aerobic or exercise*)).tw.

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

34. exp Rehabilitation/

35. exp Patient Education as Topic/

36. (patient* adj3 educat*).tw.

37. ((lifestyle or life-style) adj3 (intervent* or program* or treatment*)).tw.

38. exp Self Care/

39. exp Ambulatory Care/

40. exp Psychotherapy/

41. psychotherap*.tw.

42. (psycholog* adj3 intervent*).tw.

43. relax*.tw.

44. exp Mind-Body Therapies/

45. exp Counseling/

46. counsel?ing.tw.

47. exp Cognitive Therapy/

48. exp Behavior Therapy/

49. (behavio*r* adj4 (modif* or therap* or rehab* or change)).tw.

50. exp Stress, Psychological/

51. (stress adj3 manage*).tw.

52. (cognitive* adj3 therap*).tw.

53. exp Meditation/

54. meditat*.tw.

55. Anxiety/

56. (manage* adj3 (anxiety or depres*)).tw.

57. CBT.tw.

58. hypnotherap*.tw.

59. (goal adj3 setting).tw.

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

61. (motivat* adj3 interv*).tw.

62. exp Psychopathology/

63. psychopathol*.tw.

64. exp Autogenic Training/

65. autogenic*.tw.

66. (self adj3 (manage* or care or motivat*)).tw.

67. distress*.tw.

68. (psychosocial* or psycho-social*).tw.

69. exp Health Education/

70. ((nutrition or diet or health) adj3 education).tw.

71. heart manual.tw.

72. (secondary adj5 prevent$ adj10 (intervent* or program* or treatment* or plan* or regimen*)).tw.

73. or/25-72

74. patient compliance/

75. (increase* adj10 participat*).tw.

76. (comply or complian*).tw.

77. remain*.tw.

78. adhere*.tw.

79. (uptake or take up).tw.

80. (sign adj2 (up or on)).tw.

81. effectiv*.tw.

82. engage*.tw.

83. follow up.tw.

84. attend*.tw.

85. or/74-84

86. 24 and 73 and 85

87. random$.tw.

88. factorial$.tw.

89. crossover$.tw.

90. cross over$.tw.

91. cross-over$.tw.

92. placebo$.tw.

93. (doubl$ adj blind$).tw.

94. (singl$ adj blind$).tw.

95. assign$.tw.

96. allocat$.tw.

97. volunteer$.tw.

98. crossover procedure/

99. double blind procedure/

100. randomised controlled trial/

101. single blind procedure/

102. 87 or 88 or 89 or 90 or 91 or 92 or 93 or 94 or 95 or 96 or 97 or 98 or 99 or 100 or 101

103. (animal/ or nonhuman/) not human/

104. 102 not 103

105. 86 and 104

106. (2008* or 2009* or 2010* or 2011* or 2012* or 2013*).em.

107. 105 and 106

108. limit 107 to embase

CINAHL

S86 S82 AND S85

S85 S83 OR S84

S84 (MH "Randomized Controlled Trials") OR (MH "Single-Blind Studies") OR (MH "Triple-Blind Studies") OR (MH "Double-Blind Studies")

S83 (random* or blind* or allocat* or assign* or trial* or placebo* or crossover* or cross-over*)

S82 S22 AND S69 AND S81

S81 S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80

S80 attend*

S79 engage*

S78 "follow up"

S77 effectiv*

S76 "sign up" or "sign on"

S75 uptake or "take up"

S74 adhere*

S73 remain*

S72 comply or complian*

S71 (increase* N10 participat*)

S70 (MH "Patient Compliance")

S69 S23 or 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 or S52 or 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

S68 (heart manual)

S67 ((nutrition or diet or health) N3 education)

S66 (MH "Health Education+")

S65 (psychosocial* or psycho-social*)

S64 (distress*)

S63 (autogenic*)

S62 (MH "Autogenic Training (Iowa NIC)")

S61 (psychopathol*)

S60 (MH "Psychopathology")

S59 (motivat* N3 interv*)

S58 (psycho-educat* or psychoeducat*)

S57 (goal N3 setting)

S56 (hypnotherap*)

S55 CBT

S54 (manage* N3 (anxiety or depres*))

S53 (MH "Anxiety")

S52 (meditat*)

S51 (MH "Meditation")

S50 (cognitive* N3 therap*)

S49 (stress N3 manage*)

S48 (MH "Stress, Psychological+")

S47 (behavio*r* N4 (modif* or therap* or rehab* or change))

S46 (MH "Behavior Therapy+")

S45 (MH " Cognitive Therapy")

S44 (counsel?ing)

S43 (MH "Counseling+")

S42 (MH "Mind Body Techniques+")

S41 (relax*)

S40 (psycholog* N3 intervent*)

S39 (psychotherap*)

S38 (MH "Psychotherapy+")

S37 (MH "Ambulatory Care")

S36 (MH "Self Care+")

S35 ((lifestyle or life-style) N3 (intervent* or program* or treatment*))

S34 (patient* N3 educat*)

S33 (MH "Patient Education+")

S32 (MH "Rehabilitation+")

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

S30 (train* N3 (strength* or aerobic or exercise*))

S29 (MH "Exercise+")

S28 (physical* N3 (fit* or train* or therap* or activit*))

S27 rehabilitat*

S26 (MH "Physical Activity")

S25 (MH "Sports")

S24 (MH "Therapeutic Exercise+")

S23 (MH "Rehabilitation Centers")

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 or S20 or S21

S21 (stent* N3 (heart or cardiac*))

S20 PTCA

S19 CABG

S18 (cardiac*)

S17 (myocard*)

S16 (heart N3 disease*)

S15 (MH "Heart Diseases+")

S14 (heart N3 (failure or attack))

S13 (MH "Heart Failure+")

S12 (angina)

S11 (MH "Angina Pectoris+")

S10 (heart N3 infarct*)

S9 (myocard* N3 infarct*)

S8 (MH "Myocardial Infarction+")

S7 (MH "Myocardial Revascularization+")

S6 (MH "Coronary Disease+")

S5 (coronary)

S4 (MH "Coronary Artery Bypass+")

S3 (isch?mi* N3 heart)

S2 (myocard* N3 isch?mi*)

S1 (MH "Myocardial Ischemia+")

Web of Science

#40 #39

#39 #38 AND #37 AND #34 AND #7

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

#37 #36 OR #35

#36 TS=(comply or complian* or remain* or adhere* or uptake or "take up" or "sign up" or "sign on" or effectiv* or "follow up" or engage* or attend*)

#35 TS=(increase* near/10 participat*)

#34 #33 OR #32 OR #31 OR #30 OR #29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8

#33 TS=heart manual

#32 TS=(((nutrition or diet or health) near/3 education))

#31 TS=((psychosocial* or psycho-social*))

#30 Topic=((distress*))

#29 Topic=((self near/3 (manage* or care or motivat*)))

#28 Topic=((self near/3 (manage* or care or motivat*)))

#27 TS=((psychopathol* OR autogenic*))

#26 Topic=((motivat* near/3 interv*))

#25 Topic=((psycho-educat* or psychoeducat*))

#24 Topic=((goal near/3 setting))

#23 Topic=((hypnotherap*))

#22 Topic=(CBT)

#21 Topic=((manage* near/3 (anxiety or depres*)))

#20 Topic=((meditat*))

#19 Topic=((cognitive* near/3 therap*))

#18 Topic=((stress near/3 manage*))

#17 Topic=((behavio*r* near/4 (modif* or therap* or rehab* or change)))

#16 TS=((relax* OR counsel?ing))

#15 Topic=((psycholog* near/3 intervent*))

#14 Topic=((psychotherap*))

#13 Topic=(((lifestyle or life-style) near/3 (intervent* or program* or treatment*)))

#12 Topic=((patient* near/3 educat*))

#11 Topic=(((exercise* or fitness) near/3 (treatment or intervent* or program*)))

#10 Topic=((train* near/3 (strength* or aerobic or exercise*)))

#9 Topic=((physical* near/3 (fit* or train* or therap* or activit*)))

#8 Topic=(rehabilitat*)

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

#6 Topic=((stent* near/3 (heart or cardiac*)))

#5 TS=(heart near/3 (failure or attack or infarct* or disease*))

#4 Topic=((myocard* near/3 infarct*))

#3 TS=(coronary or angina or myocard* or cardiac* or CABG or PTCA)

#2 Topic=((isch?mi* near/3 heart))

#1 Topic=((myocard* near/3 isch?mi*))

WHAT'S NEW

Date	Event	Description
3 October 2018	New citation required and conclusions have changed	Fourteen new trials were identified. Evidence suggests that interventions to increase utilisation of cardiac rehabilitation are effective. Enrolment interventions should target healthcare providers, training nurses, or allied healthcare providers to intervene face-to-face; adherence interventions may be offered remotely. More research is needed to understand specifically how to promote completion
10 July 2018	New search has been performed	Database searches re-run on 10 July 2018

HISTORY

Protocol first published: Issue 2, 2008
Review first published: Issue 7, 2010

Date	Event	Description
3 October 2013	New citation required but conclusions have not changed	Eight new trials were identified but the conclusions remain unchanged
23 January 2013	New search has been performed	Search was updated in January 2013

CONTRIBUTIONS OF AUTHORS

Santiago de Araújo Pio C was responsible for conducting the literature review/study selection, handsearching the literature, extracting data from included studies, performing meta-analysis of data, conducting risk of bias and GRADE assessments, generating the 'Summary of findings' table, and updating review results (text and display items).

Chaves GSS was responsible for conducting the literature review/study selection, extracting data, assessing risk of bias, and performing initial analysis of data.

Davies P was responsible for designing previous versions of the review, reviewing GRADE, critically revising the manuscript for important intellectual content, and providing final approval of the review.

Taylor RS was responsible for designing previous versions of the review, performing meta-regression analysis, critically revising the manuscript for important intellectual content, and providing final approval of the review.

Grace SL was responsible for co-ordinating the update, updating study methods, resolving abstract and full-text conflicts, assisting in interpretation of data, updating the review content text, and providing final approval of the review.

DECLARATIONS OF INTEREST

CSAP: none known.

GSSC: none known.

PD: none known.

RST: currently a co-author of several other Cochrane Reviews on cardiac rehabilitation. He is Chief Investigator in receipt of ongoing National Institute of Health Research Programme Grants for Applied Research (RP-PG-1210-12004): Rehabilitation Enablement in Chronic Heart Failure (REACH-HF). He was involved in some of the included trials, but was not involved in the RoB or GRADE assessment related to these studies.

SLG: Was principal investigator of an included trial, but did not do the RoB or GRADE assessment relating to the trial.

SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- National Institute for Health Research (NIHR) programme grant (for previous version), UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

No protocol is available for this review. However, we have made changes to the methods of this review and updated outcomes since the last version. With regard to primary outcomes, we changed the term "uptake" to the more specific "enrolment" and operationalised this outcome. We also updated the definition of "adherence" in the hope of attaining sufficient homogeneity to pool studies. Finally, we added the outcome of completion. We deleted secondary outcomes related to mortality, morbidity, quality of life, and cardiovascular risk factors, as we assume that any intervention that promotes greater CR use will result in these benefits, as reported in the related Cochrane Review on these specific outcomes (Anderson 2016).

We made changes to the inclusion/exclusion criteria, defined "CR", and considered for inclusion only studies promoting utilisation of comprehensive programmes (not just the exercise component).

In accordance with MECIR, which has been published since the last review, we applied GRADE to assess the quality of evidence and generated a 'Summary of findings' table. Finally, for the first time, we pooled included studies quantitatively.

INDEX TERMS

Medical Subject Headings (MeSH)

Angina Pectoris [rehabilitation]; Angioplasty, Balloon, Coronary [rehabilitation]; Cardiac Rehabilitation [*statistics & numerical data]; Coronary Artery Bypass [rehabilitation]; Coronary Disease [*rehabilitation]; Exercise; Heart Failure [rehabilitation]; Myocardial Infarction [rehabilitation]; Patient Acceptance of Health Care [*statistics & numerical data]; Patient Compliance [statistics & numerical data]; Randomized Controlled Trials as Topic; Secondary Prevention

MeSH check words

Adult; Female; Humans; Male; Middle Aged