Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)


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[Intervention Review]

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease

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ABSTRACT

Background

Globally, cardiovascular diseases (CVD, that is, coronary heart (CHD) and circulatory diseases combined) contribute to 31% of all deaths, more than any other cause. In line with guidance in the UK and globally, cardiac rehabilitation programmes are widely offered to people with heart disease, and include psychosocial, educational, health behaviour change, and risk management components. Social support and social network interventions have potential to improve outcomes of these programmes, but whether and how these interventions work is poorly understood.

Objectives

To assess the effectiveness of social network and social support interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease. The comparator was usual care with no element of social support (i.e. secondary prevention alone or with cardiac rehabilitation).

Search methods

We undertook a systematic search of the following databases on 9 August 2022: CENTRAL, MEDLINE, Embase, and the Web of Science. We also searched ClinicalTrials.gov and the WHO ICTRP. We reviewed the reference lists of relevant systematic reviews and included primary studies, and we contacted experts to identify additional studies.

Selection criteria

We included randomised controlled trials (RCTs) of social network or social support interventions for people with heart disease. We included studies regardless of their duration of follow-up, and included those reported as full text, published as abstract only, and unpublished data.

Data collection and analysis

Using Covidence, two review authors independently screened all identified titles. We retrieved full-text study reports and publications marked ‘included’, and two review authors independently screened these, and conducted data extraction. Two authors independently assessed risk of bias, and assessed the certainty of the evidence using GRADE. Primary outcomes were all-cause mortality, cardiovascular-
related mortality, all-cause hospital admission, cardiovascular-related hospital admission, and health-related quality of life (HRQoL) measured at > 12 months follow-up.

**Main results**

We included 54 RCTs (126 publications) reporting data for a total of 11,445 people with heart disease. The median follow-up was seven months and median sample size was 96 participants. Of included study participants, 6414 (56%) were male, and the mean age ranged from 48.6 to 76.3 years. Studies included heart failure (41%), mixed cardiac disease (31%), post-myocardial infarction (13%), post-revascularisation (7%), CHD (7%), and cardiac X syndrome (1%) patients. The median intervention duration was 12 weeks. We identified notable diversity in social network and social support interventions, across what was delivered, how, and by whom.

We assessed risk of bias (RoB) in primary outcomes at > 12 months follow-up as either ‘low’ (2/15 studies), ‘some concerns’ (11/15), or 'high' (2/15). 'Some concerns' or 'high' RoB resulted from insufficient detail on blinding of outcome assessors, data missingness, and absence of pre-agreed statistical analysis plans. In particular, HRQoL outcomes were at high RoB. Using the GRADE method, we assessed the certainty of evidence as low or very low across outcomes.

Social network or social support interventions had no clear effect on all-cause mortality (risk ratio (RR) 0.75, 95% confidence interval (CI) 0.49 to 1.13, $I^2 = 40\%$) or cardiovascular-related mortality (RR 0.85, 95% CI 0.66 to 1.10, $I^2 = 0\%$) at > 12 months follow-up. The evidence suggests that social network or social support interventions for heart disease may result in little to no difference in all-cause hospital admission (RR 1.03, 95% CI 0.86 to 1.22, $I^2 = 0\%$), or cardiovascular-related hospital admission (RR 0.92, 95% CI 0.77 to 1.10, $I^2 = 16\%$), with a low level of certainty. The evidence was very uncertain regarding the impact of social network interventions on HRQoL at > 12 months follow-up (SF-36 physical component score: mean difference (MD) 31.53, 95% CI -28.65 to 91.71, $I^2 = 100\%$, 2 trials/comparisons, 166 participants; mental component score MD 30.62, 95% CI -33.88 to 95.13, $I^2 = 100\%$, 2 trials/comparisons, 166 participants).

Regarding secondary outcomes, there may be a decrease in both systolic and diastolic blood pressure with social network or social support interventions. There was no evidence of impact found on psychological well-being, smoking, cholesterol, myocardial infarction, revascularisation, return to work/education, social isolation or connectedness, patient satisfaction, or adverse events.

Results of meta-regression did not suggest that the intervention effect was related to risk of bias, intervention type, duration, setting, and delivery mode, population type, study location, participant age, or percentage of male participants.

**Authors’ conclusions**

We found no strong evidence for the effectiveness of such interventions, although modest effects were identified in relation to blood pressure. While the data presented in this review are indicative of potential for positive effects, the review also highlights the lack of sufficient evidence to conclusively support such interventions for people with heart disease. Further high-quality, well-reported RCTs are required to fully explore the potential of social support interventions in this context. Future reporting of social network and social support interventions for people with heart disease needs to be significantly clearer, and more effectively theorised, in order to ascertain causal pathways and effect on outcomes.

**PLAIN LANGUAGE SUMMARY**

Do social support interventions help people with heart disease?

**Key messages**

There is no clear evidence to suggest that social support or social network programmes help people with heart disease.

These programmes may produce some improvement in quality of life and blood pressure.

Our review suggests that, while social support or social network interventions may have potential to help people with heart disease, more high-quality, clearly reported trials are needed to prove any effectiveness.

**What is heart disease?**

The term ‘heart disease’ refers to a range of disorders affecting the heart, including: coronary heart disease (disease of the heart blood vessels); heart rhythm problems (arrhythmias, such as atrial fibrillation); heart infections; and congenital heart defects. Common symptoms of heart disease are chest pain (angina) and heart attack (myocardial infarction). Heart disease is a common cause of early death worldwide. Modern cardiac rehabilitation programmes are typically designed to address physical, mental, and social factors, and so to support people with heart disease in their day-to-day life.

**Why might social support programmes help people with heart disease?**

There is some evidence to suggest that low levels of social support and social isolation are linked to poor health for people with heart disease. Social network or social support interventions intentionally use social relationships to support healthy behaviours, and may
involve partners, family members, friends, other peers, or caregivers. While some research suggests such programmes might contribute to improving health in people with heart disease, there has to date been no systematic review of the evidence.

**What did we want to find out?**

We wanted to find out whether programmes designed to help people with heart disease, which include a clearly described component of social support, might improve:

- deaths (from heart disease, or any other cause);
- hospital admissions;
- health-related quality of life.

We also wanted to find out if they improved any other related factors, such as mental health and well-being, and social isolation.

**What did we do?**

We searched databases for randomised controlled trials (RCTs) of social network or social support interventions for people with heart disease.

We compared and summarised the results of these studies and rated our confidence in the evidence, based on factors such as study methods and sizes.

**What did we find?**

We found 54 eligible studies involving 11,445 people with heart disease. We found wide variation in the kinds of interventions included in the review, in terms of what the programmes included, how and by whom they were delivered, and the clarity with which they were reported.

Most participants were male, with an average age ranging from 49 to 76 years. Studies included people with heart failure, post-myocardial infarction (heart attack), mixed heart disease, and post-revascularisation (procedures to widen blocked or narrowed arteries).

We found that social network or social support interventions had no clear effect on deaths, hospital admissions, or health-related quality of life.

**What are the limitations of the evidence?**

The reporting of factors such as what programmes included, how they were delivered, and how they were tested was highly variable. This made it hard to assess the evidence presented.

**How up-to-date is this evidence?**

The evidence is up-to-date as of August 2022.
## Summary of findings 1. Summary of findings

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Anticipated absolute effects* (95% CI)</th>
<th>Relative effect (95% CI)</th>
<th>Nº of participants (studies)</th>
<th>Certainty of the evidence (GRADE)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk with no social network intervention</td>
<td>Risk with social network intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-cause mortality</td>
<td>145 per 1000</td>
<td>109 per 1000 (71 to 164)</td>
<td>RR 0.75 (0.49 to 1.13)</td>
<td>3093 (6 RCTs)</td>
<td>Low&lt;sup&gt;a,b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cardiovascular-related mortality</td>
<td>90 per 1000</td>
<td>76 per 1000 (59 to 98)</td>
<td>RR 0.85 (0.66 to 1.10)</td>
<td>2583 (2 RCTs)</td>
<td>Low&lt;sup&gt;b,c&lt;/sup&gt;</td>
</tr>
<tr>
<td>All-cause hospital admission (number of events) - not reported</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>All-cause hospital admission (number of participants with at least one event) - Follow-up: &gt; 12 months</td>
<td>637 per 1000</td>
<td>656 per 1000 (548 to 777)</td>
<td>RR 1.03 (0.86 to 1.22)</td>
<td>258 (2 RCTs)</td>
<td>Low&lt;sup&gt;b,c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cardiovascular-related hospital admission (number of events) - Follow-up: &lt; 12 months</td>
<td>2200 per 1000</td>
<td>814 per 1000 (484 to 1386)</td>
<td>Rate ratio 0.37 (0.22 to 0.63)</td>
<td>48 (1 RCT)</td>
<td>Low&lt;sup&gt;d,e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cardiovascular-related hospital admission (number of participants with at least one event) - Follow-up: &gt; 12 months</td>
<td>377 per 1000</td>
<td>347 per 1000 (291 to 415)</td>
<td>RR 0.92 (0.77 to 1.10)</td>
<td>2583 (2 RCTs)</td>
<td>Low&lt;sup&gt;b,c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Health-related quality of life</td>
<td>The mean health-related quality of life ranged from <strong>23 to 38.3</strong> MD <strong>31.53 higher</strong> (28.65 lower to 91.71 higher)</td>
<td>—</td>
<td>166 (2 RCTs)</td>
<td>⬤◯◯◯ Very low&lt;br&gt;a,b,c,f</td>
<td>The evidence is very uncertain about the effect of social network interventions on health-related quality of life.</td>
</tr>
<tr>
<td>Health-related quality of life</td>
<td>The mean health-related quality of life ranged from <strong>20.4 to 48.8</strong> MD <strong>30.62 higher</strong> (33.88 lower to 95.13 higher)</td>
<td>—</td>
<td>166 (2 RCTs)</td>
<td>⬤◯◯◯ Very low&lt;br&gt;a,b,c,f</td>
<td>The evidence is very uncertain about the effect of social network interventions on health-related quality of life.</td>
</tr>
<tr>
<td>Adverse events - not reported</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Adverse events were not reported at long-term follow-up in any included studies.</td>
</tr>
</tbody>
</table>

*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; MD: mean difference; RCT: randomised controlled trial; RR: risk ratio

**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.

Explanations

a Risk of bias: most of the evidence comes from individual studies with a high risk of bias for one item or some concerns for multiple items and overall.

b Imprecision: 95% CI is wide and overlaps no effect.

c Imprecision: outcome measured in few participants/studies.

d Indirectness: based on a single study, with only a small number of angina patients (90% male).

e Imprecision: based on a single study.

f Inconsistency: evidence of substantial heterogeneity ($I^2 = 100\%$).
BACKGROUND

Description of the condition

‘Heart disease’ encompasses a range of disorders affecting the heart, including: diseases of the heart blood vessels (coronary heart disease (CHD)); heart rhythm problems (arrhythmias, such as atrial fibrillation); heart infections; and congenital heart defects. CHD is the most common type of heart disease. Its common symptoms are chest pain (angina) and heart attack (myocardial infarction). Coronary heart disease may necessitate a revascularisation procedure, and can lead to chronic heart failure. Globally, cardiovascular diseases (CVD; heart and circulatory diseases combined) contribute to 31% of all deaths, more than any other cause (WHO 2017). Of the estimated 17.7 million deaths from CVD in 2015, the most common cause (7.4 million) was CHD. Of 17 million premature deaths from non-communicable diseases in the same year, 37% were caused by CVD (WHO 2017).

Cardiac rehabilitation programmes typically go beyond secondary prevention, aiming to address physical, mental, and social factors, and thus to support individuals to continue or resume their day-to-day life following a cardiac event, diagnosis, or procedure (BACPR 2017). In line with guidance in the UK and globally, cardiac rehabilitation programmes are widely offered to people with a number of presentations of heart disease, and include various psychosocial, educational, health behaviour change, and risk management components (Dalal 2015). In this review, we focused on heart disease indications for which people in the UK are typically referred for cardiac rehabilitation, namely: CHD (including myocardial infarction, post-revascularisation, and stable angina); chronic heart failure; atrial fibrillation; and following valve replacement or repair procedures (BACPR 2017).

Description of the intervention

The impact of social networks on health behaviours, and the social support communicated through them, has generated a vast body of literature, grounded in sociological, anthropological, and psychological theory (Berkman 2000). Interest has increased in recent times regarding how the influence of social networks might be harnessed in health interventions. Evidence suggests that social network or social support interventions are associated with positive outcomes in some health behaviours (Hunter 2019). Low levels of social support are specifically associated with increased risk of CHD events (Lett 2005), and social isolation and weak social networks have been linked to poor outcomes for individuals with heart disease (Heidari Gorji 2019). Social support or social network interventions therefore may have potential in rehabilitation or secondary prevention programmes for CVD. Contemporary technologies can facilitate remote provision or engendering of social support - for example via the use of social media, smart device applications (apps), video conferencing-based interventions - potentially broadening the scope of social network interventions for health. As such, as an adjunct to current evidence-based secondary prevention and rehabilitation measures, social network and social support interventions may play an important role in improving outcomes for people with CVD (Piepoli 2016).

The scope of this review was to include interventions specifically identified as using ‘social networks’ or ‘social support’. Diversity in how these terms are understood and used means conceptual clarity is essential. In this review, and following Berkman 2000, we have used ‘social network’ to mean ‘the web of social relationships that surrounds an individual and the characteristics of those ties’ (e.g. family, friendship, or other social groups); and ‘social support’ to mean one of the ‘mediating pathways by which networks might influence health’, using emotional, instrumental, appraisal, or informational means (House 1981). This may be provided, for example, via peer-to-peer support, app-based support, or dedicated online groups. We have used ‘social network intervention’ or ‘social support intervention’ to indicate interventions that explicitly aim to mobilise relationships with partners, informal caregivers, friends, family members, or peer supporters, to improve health.

The review included interventions that intentionally capitalised on social networks or social support, which were implemented individually or in groups, and in a range of settings including home, primary or secondary care, or remotely (by phone or online), or using a hybrid model that combines these. The review included interventions which: aimed to reduce social isolation or improve connectedness, or both; used apps or social media technologies to intentionally connect people with heart disease; or a combination of these. Although we also planned to include interventions built on a formal component of Social Network Analysis (SNA), no such studies were identified.

How the intervention might work

Social networks and social support can operate at a number of levels to promote healthy behaviours, through mechanisms including: reinforcement, encouragement, motivation, feedback, empathy, role modelling, increased self-efficacy, instrumental support (i.e. practical help), emotional support, appraisal (e.g. affirmation), peer pressure for healthy behaviours, or access to health information (Simpson 2015). Social support can be provided by family, friends, peers or wider social networks, and members of specific groups with a common behavioural goal (e.g. weight loss groups). Social support has been identified as a key component in both initiating and sustaining behaviour change (Hunter 2019; Simpson 2011; Simpson 2020). Nevertheless, how social networks or social support might improve outcomes for people with heart disease is largely under-theorised.

The application of behaviour change theory in a different health context (weight loss) suggests a social network or social support interventions can facilitate goal-setting, action-planning, problem-solving, support ongoing health goals, encourage self-monitoring, and promote autonomy (Simpson 2020). They may offer an opportunity to enhance inclusion and accessibility for populations who are less likely to engage in cardiac rehabilitation, such as women and people from black, Asian, and some other ethnic minority groups (Dalal 2015). Contextual factors shaping the feasibility and effectiveness of social network or social support interventions might include: the availability of friends, family, or peers to offer support; characteristics of the person offering support; characteristics of the social network or relationship; degree of integration within a social network; access to resources (e.g. time to exercise, healthy food, etc.); socioeconomic factors; and everyday barriers to, and facilitators of, participation (Berkman 2000; Simpson 2011).
Why it is important to do this review

Heart disease is a global public health concern associated with significant health, social, and economic burden in developed and developing countries alike. Social isolation and low social support are known to be common in people with cardiac disorders, and associated with poor outcomes, including increased risk of hospital readmission (Heidari Gorji 2019; Lett 2005; Mookadam 2004). More broadly, there is growing interest in understanding the impact of social network and social support-based interventions on health-related behaviour (Berkman 2000). Interventions with social support components are not well understood, and there is no current consensus on how they might be most effectively provided. Moreover, the restrictions on healthcare and increased elements of social isolation that have accompanied the COVID-19 pandemic have also brought to the fore a potential need to consider means of fostering social support for health.

The addition of social network or social support interventions has a potential role in enhancing the effectiveness of secondary prevention and cardiac rehabilitation. In the UK and globally, cardiac rehabilitation is widely offered for the conditions noted above, and includes various psychosocial, educational, health behaviour change, and risk management components (Dalal 2015). However, even prior to the COVID-19 pandemic, uptake was suboptimal and inequitable, due to a combination of factors including accessibility, dislike of centre-based classes, an absence of both uniform referral processes and physician familiarity, and availability. Referral and uptake was disproportionately lower in women, people in lower socioeconomic groups, and people from black, Asian, or other ethnic minority groups (Dalal 2015 ). In some contexts, up-front costs to users of cardiac rehabilitation and inconsistent reimbursement also act as barriers (Babu 2016). Lower cost, non-centre-based cardiac rehabilitation can improve uptake (Dalal 2019). However, depending on the mode of delivery, it may risk limiting face-to-face interaction with others with similar conditions. Including social network or social support components in cardiac rehabilitation programmes may address this limitation. Guidelines on cardiac rehabilitation specifically highlight the importance of improving outcomes by using pre-existing social support mechanisms, and encouraging new social connections where available and appropriate (BACPR 2017; SIGN 2017). They also highlight the potential to capitalise on new technologies (Piepoli 2016). As a result of the COVID-19 pandemic, the need for secondary prevention and effective models of cardiac rehabilitation, based outside traditional clinical settings – including in the home and using remote delivery – has become acute, as has the need to address social isolation. The pandemic has emphasised the challenges, opportunities, and the demand for innovative approaches, including social network and social support interventions (Dalal 2020; Sire 2020).

With this review, we aimed to contribute to a body of knowledge on the potential benefits of interventions that intentionally used social networks or social support for people with heart disease, and to inform future research and intervention development.

OBJECTIVES

The primary objective was to assess the effectiveness of social network and social support interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease, compared to a usual care comparator that did not contain an element of social network and social support (but could include secondary prevention alone, or secondary prevention and cardiac rehabilitation).

METHODS

Criteria for considering studies for this review

Types of studies

On the basis of the review question we sought studies with appropriate methodological designs, as specified in the review protocol (Purcell 2021). We thus included randomised controlled trials (RCTs) of a social network or social support intervention for people with heart disease. RCTs had an individual participant allocation, cluster-allocation, or cross-over design. We included trials regardless of their duration of follow-up. We searched all databases from their inception to the present and imposed no restriction on language of publication or publication status.

Types of participants

We included all individuals aged ≥ 18 years with physician-diagnosed chronic heart failure (hereafter ‘heart failure’), coronary heart disease (myocardial infarction (MI), post-revascularisation, or stable angina), atrial fibrillation, or post-valve replacement or repair procedures.

Where a trial contained a mixed population (i.e. individuals with diagnoses other than heart disease), we 1) assessed whether subgroup results for heart disease were reported. If not, we contacted the trial authors. Where results were not available, we 2) included all trial data, providing people with heart disease made up 50% or more of the total trial population.

We excluded trials that did not focus (at least 50% of trial population) on participants with heart failure, coronary heart disease (MI, post-revascularisation, or stable angina), atrial fibrillation, or post-valve replacement or repair procedures.

Types of interventions

We included all interventions that explicitly incorporated a social network or social support component, that is, interventions that involved partners, informal caregivers, friends, family members, peer or lay supporters (e.g. others with the same condition). Interventions were implemented individually or in groups, including those using applications (apps) or other social media technologies to connect people with heart disease. We excluded interventions where the only form of social support was interaction with a health or social care professional (even where framed explicitly as ‘social support’), as these did not meet our definition. We considered all social network or social support interventions, delivered either alone or as part of a wider cardiac rehabilitation (CR) programme (for example, along with exercise or educational components), including those that were single or multicomponent. Interventions could be based in a range of settings, including the participant’s home, the community, or in primary or secondary care, providing the above criteria were met.

The review characterised the nature of the intervention (e.g. location, mode of delivery, duration, intensity) for each included study. Where there were sufficient studies, we explored the impact of these intervention variations on participant outcomes, using approaches that include meta-regression.
Both the intervention and control group participants received usual medical care as reported by the study. Usual care typically comprised secondary prevention measures, including regular check-ups, drug treatment (e.g. antihypertensive or lipid-lowering drugs), and advice for a healthy and active lifestyle (e.g. diet, smoking, and physical activity). Some participants also received a programme of cardiac rehabilitation. This review included studies that explicitly assessed the impact of the addition of a social network or social support intervention to a usual care comparator that could include secondary prevention alone, or secondary prevention and cardiac rehabilitation.

**Types of outcome measures**

It was not essential that trials reported one or more of the outcomes listed here in order to be included in the review. When a published report did not appear to report one of these outcomes, we accessed the trial protocol and contacted the trial authors to ascertain whether the outcomes were measured but not reported. We included relevant trials that measured these outcomes but did not report the data (or not in a usable format) as part of the narrative below.

We extracted primary and secondary outcomes at all reported follow-up points, categorised as short-term (12 months or less) or long-term (more than 12 months). As long-term follow-up (more than 12 months) is our period of most interest – due to its utility in informing policy decisions – we only included trials with follow-up of more than 12 months in Summary of findings 1.

**Primary outcomes**

1. All-cause mortality.
2. Cardiovascular-related mortality.
3. All-cause hospital admission (number of events).
4. All-cause hospital admission (number of participants with at least one event).
5. Cardiovascular-related hospital admission (number of events).
6. Cardiovascular-related hospital admission (number of participants with at least one event).
7. Health-related quality of life (HRQoL) assessed by validated generic (e.g. Short-Form 36 (SF-36)) or disease-specific (e.g. HeartQoL) questionnaires.

**Secondary outcomes**

1. Psychological well-being (validated measures of depression and anxiety, e.g. Hospital Anxiety and Depression Scale (HADS)).
2. Heart disease risk factors:
   a. smoking;
   b. blood pressure (systolic);
   c. blood pressure (diastolic);
   d. low-density lipoprotein (LDL);
   e. high-density lipoprotein (HDL); and
   f. total cholesterol.
3. Myocardial infarction (number of events).
4. Myocardial infarction (number of participants with at least one event).
5. Revascularisation (number of events).
6. Revascularisation (number of participants with at least one event).
7. Physical activity behaviour (validated self-report measures of physical activity, e.g. International Physical Activity Questionnaire (IPAQ-SF), Global Physical Activity Questionnaire (GPAQ), European Health Interview Survey Physical Activity Questionnaire (EHIS-PAQ), or objective measures like accelerometry).
8. Return to work or full-time education.
9. Social isolation and connectedness using validated outcomes (e.g. Multidimensional Scale of Perceived Social Support (MSPSS), Personal Social Capital Scale (PSCS)).
10. Participant satisfaction (validated measures, e.g. Patient Satisfaction Questionnaire).
11. Adverse events: we included any reports of adverse events related to the intervention, by number of events of each type. We defined adverse events as any untoward occurrence related to the intervention (e.g. psychological distress associated with use of the intervention).

**Search methods for identification of studies**

**Electronic searches**

We identified trials through systematic searches of the following bibliographic databases on 9 August 2022:

- Cochrane Central Register of Controlled Trials (CENTRAL 2022, Issue 8) (Cochrane Library);
- MEDLINE (R) ALL (Ovid, 1946 to 8 August 2022);
- Embase (Ovid, 1980 to 2022 week 31);
- Web of Science Core Collection (Clarivate Analytics, 1900 to 9 August 2022).

We adapted the preliminary search strategy for MEDLINE Ovid to use in the other databases (Appendix 1). We applied the Cochrane sensitivity and precision-maximising RCT filter to MEDLINE Ovid, and adaptations of it to the other databases, except CENTRAL (Lefebvre 2019).

We conducted a search of the US National Institutes of Health Ongoing Trials Register ClinicalTrials.gov (www.ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform (apps.who.int/trialsearch/) for ongoing or unpublished trials, on 9 August 2022.

We searched all databases from their inception to the present, and imposed no restriction on language of publication or publication status. We did not perform a separate search for adverse effects of social network or social support interventions for people with heart disease.

**Searching other resources**

We examined reference lists of all included studies and any relevant systematic reviews for additional studies or additional references to trials. Where relevant, we contacted the main authors of studies and experts in the field to ask for any missed, unreported, or ongoing trials.

**Data collection and analysis**

**Selection of studies**

Using Covidence, two review authors (of CP, MHB, GD, and SS) independently screened titles and abstracts of all records identified...
in the searches, marking these for inclusion or exclusion in full-text review. In cases of disagreement, we asked a third review author from the same group to arbitrate. We retrieved full-text study reports and publications marked ‘included’, and two review authors (of CP, MHB, LM, GD) independently screened full-text reports, identified studies for data extraction, and identified and recorded reasons for excluding ineligible studies. We resolved disagreements through discussion or, if required, by consulting a third author (RST or SAS). We identified and excluded duplicate records, and collated multiple reports from the same study, so that each study (rather than each report) was the unit of interest in the review. Supported by Covidence, we recorded the selection process in sufficient detail to complete a PRISMA flow diagram and 'Characteristics of excluded studies' table (Liberati 2009).

Data extraction and management

We used a data extraction form for study characteristics and outcome data, which was piloted on two studies in the review. One review author (of CP, GD, VJP, and MT) extracted the following characteristics from included studies, with data extraction checked by a second review author:

1. Methods: study design, number of study centres, study setting, dates of study conduction, and maximum follow-up.
2. Participants: inclusion criteria, exclusion criteria, N randomised, heart disease diagnosis, mean age or age range, sex, ethnicity and socio-economic status, and, if specified, supporters’ age, sex, relationship to patient, and how they were identified.
3. Interventions: descriptions of the intervention(s), comparison(s), and any co-interventions. The intervention description included coding of the nature of the intervention categorised by: theoretical underpinning, type of intervention, intervention components, type(s) of support provided, who provided support (e.g. partners, family, peer supporters), delivery setting, whether face-to-face or remote, delivered one-to-one or in a group, supervised or unsupervised, intensity (number of contacts/sessions + session duration), total programme duration, whether adaptation was allowed, and whether adherence or fidelity was assessed.
4. Outcomes: primary and secondary outcomes specified and collected, and time points reported.
5. Notes: funding for trial and notable conflicts of interest of trial authors.

In the two instances where trial reports required translation, a review author worked closely in person with a translator (academic colleague) to extract the relevant data.

Two review authors (of CP, MT, GD, MHB, and VJJP) independently extracted outcome data from included studies. We resolved disagreements by consensus, or by involving a third author (SAS or RST). Coding of interventions was also conducted as per the four domains of social support (House 1981) noted in the Description of the intervention, namely emotional, informational, appraisal, and instrumental support. For consistency, all coding was conducted by MT and checked by CP. One author (GD, supported by OUM) was responsible for transfer of data into RevManWeb (Review Manager 2020). Accuracy of data entry was checked by comparing the data presented in the review with the original data extraction form. A second review author (SAS) performed spot-checks on study characteristics for accuracy against the trial report.

Assessment of risk of bias in included studies

Working in pairs, two review authors (of CP, GD, MHB, VJJP) independently assessed risk of bias for each study using the second version of the Cochrane risk of bias tool (RoB 2), outlined in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2019c). We resolved any disagreements by discussion, or these were arbitrated by RST or SAS. The effect of interest we assessed is the effect of assignment to the intervention. The outcomes we assessed were those included in the summary of findings table. We used the RoB 2 tool to manage the assessment of bias. We assessed the risk of bias of specific results of a trial according to the following domains:

1. bias arising from the randomisation process;
2. bias due to deviations from intended interventions;
3. bias due to missing outcome data;
4. bias in measurement of the outcome;
5. bias in selection of the reported result.

We assessed risk of bias in each domain. An algorithm (decision tree) using a series of signalling questions and answers (yes, probably yes, no information, probably no, no) determined risk of bias (low, some concerns, and high). Our analysis of bias due to deviations from intended interventions assessed the effect of assignment to the intervention at baseline, also known as the ‘intention-to-treat’ effect.

We classified each potential source of bias as high, low, or some concerns, and provided a quotation from the study report as justification for our judgement, recording these details in the RoB 2 Excel tool. We summarised our risk of bias judgements across different studies, by each domain listed.

When analysing treatment effects, we considered the risk of bias for the studies that contributed to that outcome. In the Results section of the review, we present visual summaries of the RoB 2 judgements for each outcome and study, and narrative summaries of the risk of bias judgements for each domain within each outcome. We determined the overall risk of bias for each study, according to the criteria for reaching overall risk of bias judgements, set out in Table 8.2.b in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2019c). We have provided full details of the consensus decisions on risk of bias for each signalling question, study, and outcome, together with supporting quotations, in an online repository.

Measures of treatment effect

We analysed dichotomous data as risk ratios (RR) with 95% confidence intervals (CI), and continuous data as mean differences (MD) with 95% confidence intervals. For any outcomes that were measured by studies in a variety of ways, we either analysed these outcomes separately, or used the standardised mean difference (SMD) with 95% confidence intervals as a summary statistic. We interpreted the SMD using the two approaches recommended in the Cochrane Handbook for Systematic Reviews of Interventions. First, for all mean pooled SMDs, we applied the rule of thumb, based on Cohen’s effect sizes (i.e. 0.2 represents a small effect, 0.5 a moderate effect, and 0.8 a large effect). In addition, we converted the SMD to the original scale units from a particular trial, by multiplying the pooled mean SMD by a standard deviation (SD).
We entered data presented as a scale with a consistent direction of effect.

Unit of analysis issues

In accordance with Section 16.4 of the Cochrane Handbook for Systematic Reviews of Interventions, we aimed to include data from both periods of any cross-over trials identified, assuming (i) there was a wash-out period considered long enough to reduce carry-over, (ii) no irreversible events, such as mortality, occurred, and (iii) appropriate statistical approaches were used (Higgins 2019a).

We used multiple time points from individual trials to define completely separate pooled analyses of outcomes (e.g. HRQoL less than six months; HRQoL between six and 12 months, etc.). This approach prevented the same data from appearing more than once in the same analysis.

Where a trial had more than two control or intervention arms (e.g. cardiac rehabilitation and social support (intervention arm) versus cardiac rehabilitation alone (control arm 1), versus no intervention (control arm 2)), we included two interventions versus control comparisons, by dividing the number randomised to the intervention group for each comparison in half to obtain the denominator for data analysis. The mean and standard deviation for the intervention group remain unchanged for both comparisons. In some instances where only one of the two intervention arms was eligible for inclusion in the review, we have only used the data for the one eligible intervention arm, keeping the numbers randomised to the intervention and control group the same.

Dealing with missing data

As necessary, we contacted trial authors in order to verify key study characteristics or obtain missing outcome data or clarify outcome data. If no response was received and data could not be input into meta-analysis, we included a narrative description of the results. Where possible, we also used the RevManWeb calculator to calculate missing standard deviations, using other data from the trial, such as confidence intervals, based on methods outlined in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2019b).

Assessment of heterogeneity

We inspected forest plots visually to consider the direction and magnitude of effects, and the degree of overlap between confidence intervals. We used the I² statistic to measure heterogeneity among the trials in each analysis, but acknowledge that there is substantial uncertainty in the value of I² when there is only a small number of studies. We also considered the P value from the Chi² test, i.e. the confidence interval for I². Where we identified considerable heterogeneity (i.e. I² values of 75% to 100%), we have reported it but were unable to explore further due to small numbers of included studies. We also explored the clinical heterogeneity of included studies qualitatively, by comparing their characteristics.

Assessment of reporting biases

Where we were able to pool 10 or more trials, we created and examined a funnel plot, and used the Egger test (Egger 1997), to explore possible small study biases for the primary outcomes.

Data synthesis

We included all eligible studies in the primary analysis. We undertook meta-analyses only where this was meaningful, i.e. if the interventions, participants, and outcomes were similar enough for pooling to make sense.

We express dichotomous outcomes for each comparison as risk ratios (RR). We express continuous data as mean difference (MD) with 95% CI or, when an outcome was measured and reported in more than one way (e.g. HRQoL), as standardised mean difference (SMD) with 95% CI. We entered data presented as a scale with a consistent direction of effect.

Given the clinical heterogeneity in the trials included in this review, where it was appropriate to formally pool studies, we initially used a random-effects meta-analysis model. For all meta-analyses, we also used a fixed-effect model, because of the tendency of smaller trials (which are more susceptible to publication bias) to be over-weighted with a random-effects analysis. We comment below where there were differences between results from fixed-effect and random-effects models (Heran 2008a; Heran 2008b). We completed data synthesis and analyses using RevMan Web (Review Manager 2020). We conducted meta-regression analysis using the 'metareg' command in Stata version 16.060 (Stata).

Subgroup analysis and investigation of heterogeneity

We anticipated that the size of effect for some outcomes would be related to the length of the follow-up. Therefore, we present separate meta-analyses of each outcome according to length of follow-up. That is to say, we have pooled studies with short-term follow-up (12 months or less), and long-term follow-up (more than 12 months), based on the longest follow-up reported. We also aimed to undertake univariate meta-regression, to explore heterogeneity and examine potential treatment effect modifiers. For the primary outcomes in which 10 or more trials were available (Higgins 2019a), we explored whether a relationship existed between effect estimates and the following study characteristics:

1. Risk of bias, i.e. high risk or high risk/some concerns versus low risk of bias.
2. Type of intervention (e.g. social network or social support only versus multicomponent intervention (categorical variable)).
3. Duration of social network or social support intervention (continuous variable).
4. Type of population (e.g. acute event or procedure (post-MI, revascularisation, valve surgery) versus chronic condition (e.g. heart failure, atrial fibrillation, stable angina (categorical variable)).
5. Intervention delivery setting (e.g. home versus centre-based versus hybrid (categorical variable)).
6. Intervention delivery mode (e.g. remote (phone or online) versus face-to-face versus hybrid (categorical variable)).
7. Intervention delivery group (e.g. one-to-one versus group versus hybrid (categorical variable)).
8. Study location (low- or middle-income countries (LMIC) or high-income countries (NIC), as per Organisation for Economic Co-operation and Development (OECD) classification (categorical variable)).
9. Mean age of participants (continuous variable).
10. Percentage of male and female participants (continuous variable).

Where reported by individual included studies, we extracted results of subgroup analyses, including participant-level subgroup analyses: for example, where a trial reported a difference in the effectiveness of interventions between males and females. Where applicable, we used the formal test for subgroup differences in RevMan Web, and base our interpretation on this (Review Manager 2020).

**Sensitivity analysis**

We did not undertake sensitivity analyses.

**Summary of findings and assessment of the certainty of the evidence**

Long-term follow-up (> 12 months) was our period of most interest, because it is useful to inform policy decisions. We have thus included long-term follow-up (> 12 months) for each of the specified primary outcomes in the summary of findings table:

1. All-cause mortality
2. Cardiovascular-related mortality
3. All-cause hospital admission (number of events)
4. All-cause hospital admission (number of participants with at least one event)
5. Cardiovascular-related hospital admission (number of events)
6. Cardiovascular-related hospital admission (number of participants with at least one event)
7. Health-related quality of life (HRQoL) assessed by validated generic (e.g. Short-Form 36) or disease-specific (e.g. HeartQoL) measures

8. Adverse events

Two review authors (GD and RST) independently made judgements about the certainty of the evidence, with disagreements resolved by discussion, or by involving a third review author (RST or SAS). We used the five GRADE considerations (risk of bias, consistency of effect, imprecision, indirectness, and publication bias) to assess the certainty of the evidence for the pre-specified primary outcomes. We used the overall RoB 2 judgement for each outcome as part of the GRADE assessment for risk of bias. We used methods and recommendations described in Chapter 14 of the Cochrane Handbook for Systematic Reviews of Interventions (Schünemann 2019), and used GRADEpro software (GRADEpro GDT) to generate the summary of findings table. We documented and justified all assessment decisions for downgrading the certainty of the evidence in the footnotes of the summary of findings table.

**RESULTS**

**Description of studies**

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

**Results of the search**

Electronic searches identified 11,040 references. Manual searching for linked publications for eligible studies, and of reference lists of eligible publications and relevant systematic reviews, identified an additional 19 publications. After de-duplication and title and abstract screening we retrieved 427 references. Following full-text screening, we identified a total of 54 RCTs (126 publications) reporting data for a total of 11,445 people with heart disease for inclusion in this review (Figure 1).
Figure 1. PRISMA flow diagram of study selection process

11,040 records identified through database searching
19 records identified through other sources

7485 records after duplicates removed

7485 records screened
7058 records excluded

427 full-text articles assessed for eligibility

301 full-text articles excluded, with reasons:
15 ongoing
28 awaiting classification
124 wrong intervention
64 not purposeful/intentional social support
44 wrong study design
12 wrong patient population
6 substudy with irrelevant results
5 caregiver outcomes only
3 trial terminated

54 studies (126 publications) included in qualitative synthesis
We identified 15 ongoing trials that met the inclusion criteria for this review, and describe these in the Characteristics of ongoing studies. We categorised 28 studies as awaiting classification, pending clarification from the trialists regarding study characteristics to determine eligibility for inclusion (see Characteristics of studies awaiting classification).

Included studies

Study design

Of the included trials, 47 (87%) were two-arm parallel RCTs, five (9%) were three-arm RCTs (Carroll 2006; Dunbar 2013; Dunn 2019; Reddy 2017; Vellone 2020), and two (4%) were wait-list control RCTs (Boese 2013; Dickson 2015). Twenty-eight (52%) of the studies were multi-centre trials, 21 (39%) were single-centre, and five (9%) did not report the number of centres from which participants were recruited.

Six studies did not contribute to the meta-analyses because they either did not report the outcomes in a way that was appropriate for inclusion (Yehle 2009), or did not report outcomes relevant to this review (Deka 2019; Dunbar 2005; Gao 2017; Maskarinec 2015; Wu 2019). Therefore, 48 trials (11,128 randomised participants) contributed to the meta-analyses.

Thirty-one (57%) trials were conducted in North America (Berkman 2003; Carroll 2006; Carroll 2007; Clark 2000; Colella 2018; Cossette 2016; Deka 2019; Dickson 2015; Dunbar 2005; Dunbar 2013; Dunn 2019; Gortner 1988; Heisler 2013; Horlick 1984; Lenz 2006; Macken 2014; Maskarinec 2015; Parent 2000; Parry 2009; Piette 2015; Pischke 2008; Powell 2008; Pozehl 2014; Reddy 2017; Riegel 2004; Sher 2002; Toobert 1998; Volpp 2017; Wu 2019; Yeh 2016; Yehle 2009), 13 (24%) studies in Europe (Antypas 2014; Asbury 2011; Bakam 2008; Blom 2009; Boese 2013; Dalal 2019; Lang 2018; Liljeroos 2012; Lindsay 2009; Nahalen-Bose 2016; Orth-Gomer 2009; Smeulders 2010; Vellone 2020), nine (17%) studies in Asia (Aliabad 2014; Deek 2017; Ebrahim 2021; Gao 2017; Mohammadpourhodki 2019; Shahriari 2013; Shojaeifar 2020; Srisuk 2017; Vahedian-Azimi 2016), and one (2%) study in Oceania (Turner 2014).

The median follow-up was seven months (range one to 108 months) and median trial sample size was 96 participants (range 24 to 2481 participants).

Participants

Seventeen trials (31%) included a mixed cardiac disease population. Twenty-two trials (41%) recruited only people with heart failure, seven trials (13%) exclusively recruited those who were post-MI, four (7%) recruited those who were post-revascularisation, four (7%) recruited people diagnosed with CHD, and one trial (1%) recruited people with cardiac syndrome X.

Overall, included trials involved 6414 (56%) male participants, two trials recruiting only males (Colella 2018; Parent 2000), and six trials recruiting only female participants (Asbury 2011; Blom 2009; Boese 2013; Clark 2000; Orth-Gomer 2009; Toobert 1998). The mean age of participants across trials ranged from 48.6 to 76.3 years with an overall median of 62.5 years.

Interventions

We identified notable diversity in the social network and social support interventions across the 54 included studies. Forty-two (78%) of the studies included a component of social network or social support as a part of a multicomponent intervention, and 12 (22%) involved social network or social support components only. The median duration of the interventions was 12 weeks (range one week (or a single session) to 104 weeks). Interventions were implemented entirely in the participants’ home in 17 (31%) trials, 13 (24%) were centre-based, and five (9%) were community-based. Three trials (6%) employed a hybrid model with a combination of centre-, community-, and home-based delivery; one trial offered a choice of home- or centre-based participation; and mode of delivery was not reported or unclear in 15 (28%) trials. In 28 (44%) of the trials the intervention was delivered face-to-face, 10 (19%) trials delivered the intervention remotely (i.e. over the telephone or Internet), 14 (26%) used a hybrid method combining face-to-face and remote delivery, one trial offered participants a choice of face-to-face or remote, and one trial did not report the delivery method. Interventions were delivered one-to-one in 21 (39%) trials, in groups in 20 (37%) trials, and using a hybrid of one-to-one and group methods in 10 (19%) trials. For three (6%) trials it was unclear if programmes were group-based or one-to-one.

The person or people who provided social support to the participant varied across trials. In 23 (43%) trials, support was provided by a family member or friend. In 11 (20%) trials, support was provided among fellow intervention participants and, in 12 (22%), support was provided by ‘peer supporters’ (i.e. people with the same diagnosis who were not participants in the trial, but had been trained to provide peer support). Support was provided by informal, primary or unpaid ‘caregivers’ in three trials (5%); while in two trials (4%) it was provided by a combination of fellow participants and the patient’s spouse/partner or a ‘significant other’. In six (11%) trials, support was provided by a combination
of (or participant choice among) fellow participants, and family members or friends.

Regarding the four domains of social support (House 1981), which we set out in Description of the intervention, emotional support was incorporated in 40 (74%) interventions across the included trials, informational support in 27 (50%), instrumental support in 25 (46%), and appraisal in 22 (41%). Eight (15%) interventions addressed all four domains of social support, while 10 (19%) addressed a combination of three domains, 18 (33%) a combination of two domains, and 15 (28%) incorporated a single domain. In three trials (5%), it was unclear which, if any, of these elements of social support had been addressed.

Comparators
Social network and social support interventions were compared to usual care in 39 (72%) trials. Thirteen (24%) compared social network and social support interventions to an active control or enhanced usual care, which included: education or written materials only (5 of 13 trials), receiving the same intervention minus the social support element (five trials), attention control (one trial), written information and weekly m-health self-management calls (one trial), or a single nurse-led self-management session, education, and optional nurse-led follow-up (one trial). Two (4%) trials used a wait-list control.

Outcomes
Primary outcomes
All-cause mortality was reported in 23 (43%), and cardiovascular-related mortality was reported in four (7%) studies, although we often extracted these data from participant flow diagrams where they were not explicitly stated as a trial outcome. All-cause hospital admission was reported in 12 (22%) studies and cardiovascular-related hospital admission was reported in eight (15%) studies.

Health-related quality of life (HRQoL) was reported in 24 (44%) studies using a variety of validated questionnaires.

Secondary outcomes
Psychological well-being was reported in 25 (46%) trials using a variety of validated measures of depression and anxiety. Of the heart disease risk factor outcomes, smoking was reported in seven (13%) trials, blood pressure in four (7%), and cholesterol in six (11%) trials. Myocardial infarctions were reported in four (7%) trials, and revascularisations in three (6%) trials. Physical activity was reported in 14 (26%) trials using a variety of subjective and objective measurement methods. Only one trial reported data on return to work. Social isolation and connectedness was reported in 21 (39%) trials using a range of validated and non-validated measures. Participant satisfaction was reported in three (6%) trials, and adverse events were also reported in three (6%) trials.

Excluded studies
We excluded 257 studies for reasons listed in the Characteristics of excluded studies. The most common reasons for exclusion were that the study design or population did not meet eligibility criteria; the intervention did not meet eligibility criteria; or that the social network or social support component of the intervention was not described in such a way as to suggest it was purposeful or intentional: for example, where participants were given the option to bring a partner to attend sessions if desired, but where no further detail was provided on how or why the partner would be included in the intervention.

Risk of bias in included studies
Risk of bias assessment was conducted for each of the primary outcomes at long-term follow-up (> 12 months) included in the Summary of findings 1. Assessments are located in Figure 2, including all domain judgements and support for judgements. Detailed risk of bias assessment data are available upon request.

Figure 2. Risk of bias assessments
Overall risk of bias across all assessed trials was predominately ‘some concerns’ (11 of 15 (73%) assessments). For Domain 1 (Risk of bias arising from the randomisation process) we judged five of the six trials assessed to have a ‘low’ risk of bias, and one did not report information on the randomisation processes, so was judged as ‘some concerns’ (Pischke 2008). Across Domain 2 (Risk of bias due to deviations from the intended interventions (effect of assignment to intervention)), eight of 15 (53%) assessments found ‘low’ risk of bias, and seven (47%) found ‘some concerns’. Assessments for Domain 3 (Risk of bias due to missing outcome data) found ‘low’ risk of bias in 13 of 15 (87%) assessments, with only two assessed as ‘high’ risk, due to high levels of missing HRQoL data and inadequate accounts of the reasons for missingness. All assessments for Domain 4 (Risk of bias in measurement of the outcome) were deemed ‘low’ risk of bias. For Domain 5 (Risk of bias arising from selection of the reported result) only three of 15 (20%) assessments found ‘low’ risk of bias, with the majority (12 of 15, 80% of assessments) finding ‘some concerns’, as trial authors tended to report insufficient detail on blinding of outcome assessors and pre-agreed statistical analysis plans.

Effects of interventions

See: Summary of findings 1 Summary of findings

Primary outcomes

All-cause mortality

Twenty-three of 54 trials (43%) reported all-cause mortality, and 22 contributed to meta-analysis (17 at short-term follow-up: Clark 2000; Cossette 2016; Dalal 2019; Deek 2017; Dunbar 2005; Dunbar 2013; Dunn 2019; Gortner 1988; Heisler 2013; Horlick 1984; Pischke 2008; Powell 2008; Shahriari 2013; Smeluders 2010; Srisuk 2017; Vellone 2020; Yeh 2016; six at long-term follow-up: Berkman 2003; Liljerods 2012; Nahlen-Bose 2016; Orth-Gomer 2009; Pischke 2008; Vahedian-Azimi 2016, and one trial contributing data at both time points (Pischke 2008)). One trial reported deaths but did not specify in which groups the deaths occurred (Carroll 2007).

In contrast to usual care comparators, there was little to no difference in all-cause mortality with social network or social support interventions at ≤ 12 months follow-up (risk ratio (RR) 0.90, 95% confidence interval (CI) 0.74 to 1.09; I² = 0%; 17 trials, 18 comparisons, 3746 participants; Analysis 1.1). Social network or social support interventions may result in a reduction in all-cause mortality at > 12 months follow-up, but the level of certainty is low (RR 0.75, 95% CI 0.49 to 1.13; I² = 40%; 6 trials/comparisons, 3093 participants; Analysis 1.2). There was no evidence of funnel plot asymmetry for follow-up at ≤ 12 months (Figure 3, Egger test: P = 0.94).

Figure 3. Funnel plot for all-cause mortality (short-term follow-up ≤ 12 months)
Cardiovascular-related mortality

Four of 54 trials (7%) reported cardiovascular-related mortality, with two at ≤ 12 months follow-up (Dalal 2013; Horlick 1984) and two at > 12 months follow-up (Berkman 2003; Nahlen-Bose 2016; no trials contributed to both time points). Social network interventions may reduce cardiovascular-related mortality at ≤ 12 months follow-up (RR 0.76, 95% CI 0.16 to 3.60; I² = 0%; 2 trials/comparisons, 332 participants; Analysis 1.3) and > 12 months follow-up (RR 0.85, 95% CI 0.66 to 1.10; I² = 0%; 2 trials/comparisons, 2583 participants; Analysis 1.4) compared to usual care comparators, but confidence intervals were very wide and analyses were based on few participants and studies, therefore certainty is low.

All-cause hospital admission

Fourteen of 54 trials (26%) reported data on all-cause hospital admission. Ten trials reported data on the number of participants with at least one hospital admission (eight at short-term follow-up: Colella 2018; Cossette 2016; Dalal 2019; Deek 2017; Heisler 2013; Lang 2018; Vellone 2020; Volpp 2017; two at long-term follow-up: Liljeroos 2012; Nahlen-Bose 2016). Two trials reported data that were not suitable for inclusion in the meta-analysis (Riegel 2004 - unclear whether data are presented as events or participants; Yehle 2009 - only reported hospitalisations in completer versus non-completer groups). The evidence suggests little to no difference between social network or social support interventions and usual care comparators in the number of participants experiencing a hospital admission at ≤ 12 months (RR 0.90, 95% CI 0.75 to 1.09; I² = 26%; 8 trials/comparisons, 2747 participants; Analysis 1.5) or > 12 months (RR 1.03, 95% CI 0.86 to 1.22; I² = 0%; 2 trials/comparisons, 258 participants; Analysis 1.6; low-certainty evidence). Four trials reported data on the total number of hospital admissions (Dalal 2013; Powell 2008; Volpp 2017; Yeh 2016). We pooled these data separately (rate ratio 0.92, 95% CI 0.82 to 1.02, I² = 0%; Figure 4).

Figure 4. Forest plot for all-cause hospitalisation (number of events)

Of the two trials excluded from meta-analysis, one reported no difference in all-cause hospital admissions between the intervention and usual care groups (30 days: 0.20 ± 0.46 versus 0.16 ± 0.53; 90 days: 0.40 ± 0.75 versus 0.44 ± 0.85, P > 0.05, respectively) (Riegel 2004).

Cardiovascular-related hospital admission

Ten of 54 trials (19%) reported data on cardiovascular-related hospital admission. Four reported the number of trial participants experiencing hospital admissions (two at short-term follow-up: Lang 2018; Volpp 2017; two at long-term follow-up: Berkman 2003; Nahlen-Bose 2016), and the evidence suggests little to no difference between the usual care or intervention group at ≤ 12 months (RR 0.54, 95% CI 0.07 to 4.00; I² = 57%; 2 trials/comparisons, 1504 participants; Analysis 1.7) or > 12 months (RR 0.92, 95% CI 0.77 to 1.10; I² = 15%; 2 trials/comparisons, 2583 participants; Analysis 1.8; low-certainty evidence). A similar result was seen for six trials reporting the total number of cardiovascular-

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related hospital admissions (rate ratio 0.72, 95% CI 0.41 to 1.02; \(I^2 = 71.5\%\); low-certainty evidence) (Figure 5) (Carroll 2007; Dalal 2019; Pischke 2008; Powell 2008; Volpp 2017; Yeh 2016). One trial, which reported data that were not suitable for inclusion in meta-analysis (Riegel 2004 - unclear whether data are presented as events or participants) found no difference in cardiovascular-related hospital admission rates between intervention and usual care groups (30 days: 0.09 ± 0.29 versus 0.09 ± 0.48; 90 days: 0.23 ± 0.52 versus 0.16 ± 0.65, \(P > 0.05\), respectively).

Figure 5. Forest plot for cardiovascular hospitalisation (number of events)

Health-related quality of life (HRQoL)

Twenty-four of 54 trials (44%) reported HRQoL data using a range of outcome measures including validated generic (e.g. Short Form (SF)-36) or disease-specific (e.g. Minnesota Living with Heart Failure Questionnaire, MLHFQ) measures. Seventeen provided data using common outcomes suitable for meta-analyses.

Generic HRQoL

Nine trials used SF-12/36 summary component scores (physical component score (PCS) and mental component score (MCS)) at ≤ 12 months follow-up (Berkman 2003; Carroll 2006; Deek 2017; Liljeroos 2012; Parry 2009; Smeulders 2010; Srisuk 2017; Vahedian-Azimi 2016; Vellone 2020), and two also reported > 12 months follow-up data (Liljeroos 2012; Vahedian-Azimi 2016). There was weak evidence of an improved PCS at ≤ 12 months with social network interventions compared to usual care comparators (mean difference (MD) 8.16, 95% CI -8.15 to 24.46; \(I^2 = 100\%\); 4 trials/comparisons, 855 participants; role-physical MD -1.49, 95% CI -12.60 to 9.62; \(I^2 = 0\%\); 2 trials/comparisons, 191 participants; bodily pain MD 1.13, 95% CI -7.21 to 9.47; \(I^2 = 0\%\); 2 trials/comparisons, 191 participants; general health MD 3.41, 95% CI -2.55 to 9.37; \(I^2 = 0\%\); 2 trials/comparisons, 191 participants; mental health MD -2.57, 95% CI -8.44 to 3.30; \(I^2 = 0\%\); 2 trials/comparisons, 191 participants; role-emotional MD -4.05, 95% CI -15.10 to 7.01; \(I^2 = 0\%\); 2 trials/comparisons, 191 participants; social function MD -1.99, 95% CI -10.16 to 6.19; \(I^2 = 7\%\); 2 trials/comparisons, 191 participants; vitality MD 1.59, 95% CI -1.38 to 4.57; \(I^2 = 0\%\); 3 trials/comparisons, 821 participants).

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Disease-specific HRQoL

There was significant improvement with social network or social support interventions compared to usual care comparators in overall MLHFQ scores in five trials (MD -4.33, 95% CI -7.18 to -1.48; I² = 0%; 5 trials/comparisons, 608 participants; Analysis 1.12) (Dalal 2019; Heisler 2013; Lang 2018; Srisuk 2017; Yeh 2016), and evidence of benefit to both physical and emotional sub-scores (physical MD -1.53, 95% CI -2.92 to -0.15; I² = 0%; 4 trials/comparisons, 511 participants; emotional MD -0.93, 95% CI -1.78 to -0.08; I² = 0%; 4 trials/comparisons, 511 participants; Analysis 1.12). There was no evidence of improvement in Kansas City Cardiomyopathy Questionnaire (KCCQ) overall scores (MD 4.17, 95% CI -2.75 to 11.09; I² = 78%; 4 trials/comparisons, 716 participants: Dickson 2015; Pozehl 2014; Smeulders 2010; Vellone 2020), or symptom stability sub-scores (MD 3.63, 95% CI -5.97 to 13.23; I² = 58%; 2 trials/comparisons, 343 participants: Pozehl 2014; Vellone 2020) (Analysis 1.13).

In addition to the meta-analyses - given both the heterogeneity in HRQoL outcome measures and methods of reporting findings - we used a SWIM (synthesis without meta-analysis, vote-counting) approach (Campbell 2020), to summarise descriptive data and direction of effect for all 24 trials that reported HRQOL (Asbury 2011; Bakan 2008; Berkman 2003; Boese 2013; Carroll 2006; Dalal 2015; Deek 2017; Dickson 2015; Ebrahimim 2021; Heisler 2013; Lang 2018; Lenz 2000; Liljeroos 2012; Macken 2014; Nahlen-Bose 2016; Parry 2009; Piette 2015; Pozehl 2014; Smeulders 2010; Srisuk 2017; Toobert 1998; Vahedian-Azimi 2016; Vellone 2020; Yeh 2016) (see Table 1). Five (21%) trials reported higher levels of HRQOL either overall, or in one or more subscales, with social network or social support interventions compared to usual care comparators. The remainder reported no difference between groups. No trials reported higher HRQOL scores in the usual care comparison groups.

Secondary outcomes

Psychological well-being

Twenty-five of 54 trials (46%) reported measuring psychological well-being (depression and/or anxiety) outcome data, and used a variety of different outcome measures. For five trials, data were not suitable for between-group comparison (Blom 2009; Lindsay 2009 - outcome data not reported; Gortner 1988 - data not reported by group; Orth-Gomer 2009; Powell 2008 - reported baseline data only). The results of the remaining 20 trials are summarised in Table 2 (Antypas 2014; Asbury 2011; Berkman 2003; Boese 2013; Clark 2000; Colella 2018; Dalal 2019; Horlick 1984; Lang 2018; Lenz 2000; Liljeroos 2012; Macken 2014; Mohammadpourhodki 2019; Nahlen-Bose 2016; Parent 2000; Pischke 2008; Pozehl 2014; Smeulders 2010; Vahedian-Azimi 2016; Yeh 2016). Five of 25 (20%) trials reported a statistically significant outcome in favour of social network or social support interventions and the remainder were neutral.

A number of trials reported on the same outcomes, thus allowing meta-analyses. We found no difference in Hospital Anxiety and Depression Scale (HADS) anxiety scores (MD -0.63, 95% CI -1.48 to 0.22; I² = 51%; 7 trials/comparisons, 1087 participants: Boese 2013; Dalal 2019; Lang 2018; Nahlen-Bose 2016; Smeulders 2010; Turner 2014; Vellone 2020); HADS depression scores (MD -0.05, 95% CI -0.79 to 0.68; I² = 45%; 5 trials/comparisons, 974 participants: Dalal 2019; Lang 2018; Nahlen-Bose 2016; Smeulders 2010; Vellone 2020) (Analysis 1.14); Beck’s Depression Inventory (BDI or BDI-II) scores (MD -1.75, 95% CI -3.64 to 0.13; I² = 73%; 4 trials/comparisons, 2095 participants: Berkman 2003; Colella 2018; Liljeroos 2012; Turner 2014) (Analysis 1.15); Patient Health Questionnaire (PHQ-9) scores (MD -0.49, 95% CI -3.57 to 2.58; I² = 85%; 2 trials/comparisons, 127 participants: Boese 2013; Macken 2014) (Analysis 1.16); or State Index anxiety scores (MD -8.47, 95% CI -18.65 to 1.71; I² = 97%; 3 trials/comparisons, 186 participants: Mohammadpourhodki 2019; Parent 2000; Vahedian-Azimi 2016) (Analysis 1.17).

Heart disease risk factors

Smoking

Seven of 54 trials (13%) reported a variety of smoking outcomes (Berkman 2003; Horlick 1984; Lindsay 2009; Powell 2008; Shahiriari 2010; Toobert 1998; Vahedian-Azimi 2016), and are summarised in Table 3, which shows no statistically significant difference between social network or social support intervention groups and usual care groups in any of the individual trials.

Blood pressure

Four of 54 trials (7%) with > 12 months follow-up reported on blood pressure (Pischke 2008; Powell 2008; Toobert 1998; Turner 2014). There was a reduction in both systolic blood pressure (MD -2.99 mmHg, 95% CI -5.70 to -0.27; I² = 0%; 991 participants) and diastolic blood pressure (MD -1.64 mmHg, 95% CI -3.23 to -0.06; I² = 0%; 991 participants) in favour of social network or social support interventions compared to usual care (Analysis 1.18).

Cholesterol

Six of 54 trials (11%) reported lipid outcomes. There was no evidence of a between-group difference in total cholesterol (MD -18.70 mg/dl, 95% CI -50.17 to 12.77; I² = 79%; five trials/comparisons, 166 participants: Bakan 2008; Macken 2014; Pischke 2008; Toobert 1998; Turner 2014; Analysis 1.19), LDL cholesterol (MD -9.88 mg/dl, 95% CI -33.47 to 13.70; I² = 81%; 5 trials/comparisons, 227 participants: Bakan 2008; Macken 2014; Pischke 2008; Reddy 2017; Toobert 1998; Analysis 1.20), or HDL cholesterol (MD -1.72 mg/dl, 95% CI -6.29 to 2.85; I² = 62%; 5 trials/comparisons, 166 participants: Bakan 2008; Macken 2014; Pischke 2008; Toobert 1998; Turner 2014; Analysis 1.21).

Myocardial infarction

Four out of 54 trials (7%) reported non-fatal myocardial infarction (MI) as an outcome. Two trials reported data on the number of participants who experienced non-fatal MI with no between-group difference (RR 0.99, 95% CI 0.81 to 1.20, I² = 0%, 2 trials/comparisons, 2697 participants: Berkman 2003; Deek 2017; Analysis 1.22). One trial that reported on non-fatal MI reported that no patients experienced MI in either arm (Vahedian-Azimi 2016). One trial reported the total number of non-fatal MI events at five-year follow-up with four events in the control group (20 participants) and two events in intervention group (28 participants) (RR 2.74 95% CI 0.39 to 30.30, P = 0.26) (Pischke 2008).

Revascularisation

Three of the 54 trials (6%) reported data on revascularisation. Two trials reported data on the number of participants who experienced...
revascularisation: Berkman 2003 reported 216 (14.4%) amongst intervention group participants versus 230 (18.5%) in the usual care control group, at up to 29-month (mean) follow-up (hazard ratio 0.94, 95% CI 0.78 to 1.14). Vahedian-Azimi 2016 reported zero revascularisations in either arm of the trial up to 24 months follow-up. At five-year follow-up, Pischke 2008 reported a total of 14 percutaneous coronary interventions (PCI) among 20 participants in the control group versus eight PCIs among 28 patients in the intervention group (RR 2.40, 95% CI 0.94 to 6.60, P < 0.05), and a total of five coronary artery bypass grafts (CABGs) among 20 patients in the control group versus two CABGs among 28 patients in the intervention group (RR 3.43, 95% CI 0.56 to 20.6, P = 0.14).

Physical activity

Fourteen of 54 trials (26%) reported a variety of physical activity outcomes that are presented in Table 4 (Alibad 2014; Antypas 2014; Carroll 2006; Dalal 2019; Dunn 2019; Lang 2013; Lindsay 2009; Macken 2014; Parent 2000; Pischke 2008; Sher 2002; Shojaefar 2020; Toobert 1998; Turner 2014). In summary, three trials reported physical activity outcomes in favour of social networking or social support interventions versus usual care comparators, and the remainder reported no between-group difference.

Return to work or education

One of the 54 trials (2%) reported data on return to work (Horlick 1984). At three-month follow-up, 63.4% of the intervention group were employed full-time compared to 62.6% of the control (P < 0.001), while at six months this was 80.6% of the intervention group versus 92.8% of the control group (P < 0.05). The study authors explained this difference as relating to a higher percentage of the intervention group receiving financial compensation and/or insurance coverage.

Social isolation and connectedness

A total of 21 out of 54 trials (39%) reported data on social isolation or connectedness using variety of outcome measures. Two trials were not suitable for inclusion (Piette 2015 - only reported data in the intervention arm; Shojaefar 2020 - reported measurement, but did not report results at follow-up (paper is a pre-print)). In four trials it was unclear whether measures were validated. Outcomes are summarised in Table 5, with no statistically significant difference in social isolation and connectedness outcomes seen across any of the 19 trials (Alibad 2014; Antypas 2014; Asbury 2011; Bakan 2008; Berkman 2003; Blom 2009; Boese 2013; Clark 2000; Colella 2018; Cossette 2016; Dunbar 2005; Gortner 1988; Heisler 2013; Lindsay 2009; Pischke 2008; Powell 2008; Riegel 2004; Toobert 1998; Turner 2014; including the four trials using unclear measures). The ENRICH Social Support Instrument was sufficiently reported across three trials to allow meta-analysis (Asbury 2011; Berkman 2003; Turner 2014), with evidence of improvement in social support seen in the intervention group compared to usual care comparators (MD 1.55, 95% CI 0.30 to 2.81; I² = 25%; 3 trials/comparisons, 1889 participants) (Analysis 1.23).

Patient satisfaction

Three of 54 trials (6%) reported patient satisfaction using various different outcomes (Antypas 2014; Dunn 2019; Lenz 2000), presented in Table 6. In summary, none demonstrated evidence of a statistically significant difference between groups.

Adverse events

In addition to the clinical outcomes reported above (mortality, hospitalisation, clinical events), three of the 54 trials (6%) reported other specific adverse event outcomes, at short-term follow-up only. Lenz 2000 reported an average number of postoperative complications/symptoms (including bleeding, chest pain (non-incisional), fever, rapid heart rate, palpitations, shortness of breath, infection, drainage, swelling, weight gain, sleep disturbance, fatigue, pain (incisional), and mood swings) at multiple follow-up time points (three to four days: 2.11 versus 0.69; two weeks: 3.00 versus 2.63; four weeks: 3.32 versus 2.15; six weeks: 2.79 versus 2.00; 12 weeks: 1.84 versus 1.63, in the intervention versus control groups, respectively). The authors describe that the higher number of complications and adverse events reported amongst the intervention group was attributable to a significant difference between groups at the first postoperative data collection time point (t = 3.05, P = 0.004), but explain that this was unlikely to be related to the intervention; they could not find any between-group differences in preoperative illness severity or perioperative complications to explain this result. Parent 2000 reported that four (11%) of the intervention group experienced postoperative complications (pulmonary oedema, peripheral embolism, intestinal reocclusion) versus two (6.5%) with postoperative complications (pulmonary oedema) in the control group, but do not provide any further information. Yeh 2016 reported no adverse events related to the protocol, but did document the following study period events (with 50 participants in each group): two arrhythmias in the tai-chi group versus zero in the education group; no episodes of syncope in the tai-chi group versus two in the education group; and two falls in the tai-chi group versus one in the education group.

Meta-regression

We examined predictors of all-cause mortality and all-cause hospital admission across the longest follow-up of each individual study, using univariate meta-regression. We did not perform meta-regression where there were fewer than 10 studies included in the meta-analyses. No statistically significant associations were seen in any of the analyses (Table 7; Table 8).

DISCUSSION

Summary of main results

We identified 54 trials (reported in 126 publications, with 11,445 participants), which met the inclusion criteria for our review. Forty-eight studies from 14 countries were appropriate for inclusion in the meta-analysis. Despite the relatively large volume of included studies, our analysis indicates that the impact of social network or social support interventions for people with heart disease, as compared with usual care, remains uncertain. We found weak evidence to suggest that social network or social support interventions may improve health-related quality of life (HRQoL), and reduce systolic and diastolic blood pressure. There may be a reduction in all-cause and cardiovascular-related mortality at > 12 months follow-up, but the certainty of evidence was low. There was a lack of evidence relating to mortality (all-cause or cardiovascular-related at ≤ 12 months), morbidity (hospital admissions, rates of myocardial infarction (MI) or revascularisation), and adverse events. There was no evidence of a consistent effect on psychological well-being, return to work,
physical activity levels, measures of social connectedness, or patient satisfaction.

Less than half of the included trials reported data on our primary outcomes: 43% on all-cause mortality; 7% on cardiovascular-related mortality; 22% on all-cause hospital admission; 15% on cardiovascular-related hospital admission; 44% on health-related quality of life. Of the trials, 46% reported on psychological wellbeing, 39% on social isolation and connectedness, and 26% on physical activity. Only a small proportion of trials reported on the remainder of our secondary outcomes: smoking in 13%; cholesterol in 11%; blood pressure and MI in 7%; revascularisation, patient satisfaction, and adverse events in 6%; and only one trial reported on return to work.

Clinical heterogeneity in the included studies was very high, with a wide variety of trial populations, comparators, outcome measures, and the composition of interventions. Interventions varied widely in terms of content, including duration, location, mode of delivery, and who provided support. While we were able to explore the impact of these characteristics in relation to all-cause mortality and all-cause hospitalisation (at longest follow-up), we were unable to do so for all participant outcomes. Where meta-regression was possible, outcome effects were independent of risk of bias, intervention, or population characteristics.

Interventions were predominantly multicomponent, with social support comprising just one part of what was implemented. While the setting for implementation was not always clear from the reporting, there was apparent diversity in where and how interventions were delivered. Most employed a home-based (31%, 17 trials) or centre-based (24%, 13 trials) model, and only a small number (6%, three trials) comprised a hybrid model. Most also used face-to-face delivery (44%, 28 trials), with smaller proportions delivered remotely (19%, 10 trials), or using a hybrid of face-to-face and remote implementation (26%, 14 trials).

Overall completeness and applicability of evidence

We believe this to be the first systematic review and meta-analysis of RCTs assessing the impact of social network and social support interventions for people with heart disease.

Of the 54 included trials, 48 contributed to the meta-analysis relating to our primary objective of assessing the effectiveness of social network and social support interventions in cardiac rehabilitation and secondary prevention for people with heart disease.

The majority of included trials (33/54) were from the preceding 10 years, while 21/54 were from 2010 or earlier (and three of those were from the 1980s and 1990s). We identified 15 ongoing studies, which suggests continued interest in this area. Only nine of the 54 trials came from any low- or middle-income countries, and none from Latin America, suggesting limited generalisability to settings where premature mortality due to heart disease is high and/or increasing (WHO 2020). Only three of the 15 ongoing studies are based in low- and middle-income countries, which suggests a need for further trials relevant to these contexts.

While the focus of this review included a number of heart disease indications (chronic heart failure, myocardial infarction, revascularisation, stable angina, atrial fibrillation, and valve replacement or repair procedures), a notable proportion of all included trials (41%) focused exclusively on people with heart failure. This may be explained, at least in part, by heart failure populations tending to have the poorest quality of life and least (perceived) suitability for more conventional models of cardiac rehabilitation, resulting in development of potentially more innovative means of support than offered by traditional cardiac rehabilitation programmes.

Quality of the evidence

Broad inconsistencies in reporting of not only intervention components and fidelity of implementation, but also randomisation and blinding methods, in included trials made assessment of their methodological quality challenging. Overall risk of bias across all assessed trials was predominately judged as ‘some concerns’. In general, reporting of randomisation processes was adequate, and risk of bias due to missing outcome data and in measurement of outcomes was low. Some concerns about risk of bias for selective reporting was common as trial authors tended to report insufficient detail on blinding of outcome assessors and pre-agreed statistical analysis plans. Risk of bias due to deviations from the intended interventions was variable across studies, ranging from low risk of bias to ‘some concerns’.

Using GRADE criteria, we found the overall certainty of the evidence for our primary outcomes to be low or very low. We downgraded the certainty of the evidence for all-cause mortality and HRQoL by one level due to most of the evidence having high risk of bias or some concerns for multiple items or overall. We downgraded all-cause mortality, cardiovascular-related mortality, all-cause and cardiovascular-related hospital admissions (number of participants with at least one event), and HRQoL by one level due to imprecision, with wide confidence intervals that included no effect. We downgraded cardiovascular mortality, all-cause hospital admissions, cardiovascular-related hospital admissions, and HRQoL by one level due to being based on few participants and/or studies. We downgraded HRQoL a further level due to evidence of substantial statistical heterogeneity ($I^2 = 100\%$).

Potential biases in the review process

Our focus on randomised controlled trial (RCT) data, and our comprehensive search and review strategy, offer notable strengths to this review. We have documented and justified all variations in our methods from the published protocol in the Differences between protocol and review section.

A number of factors should be acknowledged, which may have introduced bias into the review process. Firstly, due to the small numbers of trials included in each meta-analysis we were unable to assess small-study or publication bias for any of the primary outcomes at ≥ 12 months follow-up. Only one outcome (all-cause mortality at ≤ 12 months follow-up) was suitable and a funnel plot inspection and the Egger test did not indicate evidence of small-study bias. Similarly, we were only able to explore the effects of study characteristics on participant outcomes using meta-regression for two outcomes.

A notable limitation to the review emerged from the inconsistency in reporting of interventions trialled. The interventions reviewed were extremely diverse, and their component parts were not always clearly described; nor were measures of fidelity to intervention design always included. It was therefore challenging, in many
cases, to determine what was delivered, whether implementation had been as intended, and in most cases to make like-for-like comparison. Difficulties in establishing fidelity of implementation have been common in reporting such complex interventions.

To support understanding of what is being tested, we would strongly urge trialists to follow robust frameworks for intervention development and reporting, such as the MRC/NIHR complex intervention framework (Skivington 2021), as well as guidance on reporting for replicability such as the TiDeR checklist (Hoffman 2014). Better reporting of intervention details, including potential mechanisms/causal pathways would enable insight into how social network and social support interventions may work.

Another potential source of bias was our assessment of the ‘intentionality’ of the social network or social support element of the intervention. We excluded titles where the extent to which use of social networks or social support was not explicitly stated, which to some extent introduced a subjective decision to the review process. However, attention to this factor, and inclusion only of interventions that did expressly capitalise on the influence of social networks or social support has proven to be essential to the success of the review.

A related limitation is that, due to inconsistencies in existing trial reporting, we were unable to categorise types of social support in a standardised way that would contribute to explaining what works. What we have done is to operationalise a taxonomy based on House 1981, namely emotional, informational, appraisal, and instrumental support. Doing so highlighted that, of the four types, emotional support was the most commonly evident (74%, 40 studies). However, we see this as merely a starting point for discussion and investigation of how best to describe and explain social support intervention mechanisms in the context of heart disease. Further research is needed to understand this more fully. Given the scale of the review, and the diversity of included interventions, more work is required to develop a logic model that would effectively theorise the relationship between social network or social support interventions and heart disease outcomes.

Agreements and disagreements with other studies or reviews

This review is the first to systematically assess the evidence from RCTs of social network and social support interventions in the context of cardiac rehabilitation and secondary prevention of heart disease. Existing literature establishes social isolation and low social support as risk factors for people with heart disease, and suggests the potential for positive impact of social support interventions on subsequent outcomes (Compare 2013; Heidari Gorji 2019; Lett 2005; Mookadam 2004; Parry 2010; Song 2011). Our findings echo the suggestion that this potential continues to be weakly evidenced, and suggest that calls for improved methodological rigour made by authors of earlier reviews (such as Parry 2010) do not yet appear to have been heeded.

Social network and social support interventions have been demonstrated to have positive outcomes in some other areas of health (see Hunter 2019; Miller 2013; Simpson 2011; Simpson 2015; Simpson 2020; Spencer-Bonilla 2017). However, common features of preceding reviews have tended to be a small number of included studies, high risk of bias, variable methodological quality of included studies, challenges in identifying mechanisms of impact, and issues associated with reliance on participant-reported outcomes (Hunter 2019; Miller 2013; Spencer-Bonilla 2017; Weibel 2010). The Hunter 2019 review differed from ours in that it specifically focused on ‘social network interventions’, conceptualised as those drawing explicitly on social network data to map social connections, an approach that was not evident in the interventions included in our review. The Weibel 2010 review, on the other hand, focuses exclusively on ‘peer support’, that is, using peer-led groups, ‘buddy’ dyads, or a combination of both. These reviews suggest that the cost-effectiveness of either model is yet to be established.

On the whole, it is worth acknowledging that, while we found no strong effect for social network and social support interventions for people with heart disease, this may have been an artefact of the way in which we characterised social support or conducted the review. Since there is an evidence base to suggest that social networks and social support are significant, it is feasible that it is a result of the limitations of the included studies that we were unable to detect this.

AUTHORS’ CONCLUSIONS

Implications for practice

This review summarises current evidence on the effectiveness of social network and social support interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease. We found no strong evidence for the effectiveness of such interventions. While the data we present here are indicative of potential for positive effects, our review highlights the lack of sufficient evidence to conclusively support such interventions for people with heart disease. Further high-quality, well-reported randomised controlled trials (RCTs) are required to fully explore the potential for social support interventions in this context, and to establish their effectiveness. Future reviews may require a different approach to understanding social network and social support interventions for people with heart disease, such as identification of more closely similar interventions in terms of duration, who provides support, and other characteristics highlighted in our review. Building on a taxonomy such as that proposed by Valente 2012 may be useful in this respect.

Our review highlights a broad range of interventions that in some way, and with varying degrees of explicitness, intend to capitalise on elements of social support and social networks of people with heart disease in order to improve health outcomes.

As is the case in the effective development and evaluation of any complex health interventions, understanding of how a social network or social support intervention actually impacts health outcomes is essential to establishing effect. Unless the intervention design and, in particular, the mechanism(s) of change are clearly specified, understanding of the impact of such interventions will continue to be limited. Without such clarity, it will continue to be challenging to evidence a need to include such interventions in heart disease prevention policy and cardiac rehabilitation guidelines.

Implications for research

This review identified weak evidence to suggest that social network or social support interventions may improve disease-specific health-related quality of life (HRQoL), and blood pressure.
outcomes, and very uncertain evidence of effect on other outcomes. This suggests an urgent need for high-quality RCTs assessing the clinical and cost-effectiveness of social network and social support interventions in the context of cardiac rehabilitation and secondary prevention for people with heart disease. Interventions tested in these RCTs should be developed and reported according to robust guidelines such as the MRC/NIHR complex intervention framework (Skivington 2021). Future reporting of social network and social support interventions for people with heart disease needs to be significantly clearer, and more effectively theorised, in order to ascertain causal pathways and effect on outcomes. Researchers reporting interventions should endeavour to: specify the theoretical basis for the intervention, behaviour change techniques used, and measures of fidelity; qualify the type of intervention by the form of social support and by whom it is provided; and utilise effective reporting guidelines such as the TIDieR checklist.

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Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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Smeulders 2010 (published data only)

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Toobert 1998 (published data only)

**Turner 2014 (published data only)**


**Vahedian-Azimi 2016 (published data only)**


**Vellone 2020 (published data only)**


**Volpp 2017 (published data only)**


**Adriana 2012 (published data only)**


**Agren 2012 (published data only)**


**Adriana 2012 (published data only)**

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

There is limited evidence from one small, randomized controlled trial (RCT) to support the use of social network interventions for those involved in the management of heart disease. However, a large systematic review of 77 RCTs found that, compared to usual care, social network interventions improved outcome measures in patients with heart disease, including depression, adherence to medication, and quality of life. The majority of studies were conducted outside of China. Studies with a control arm found that compared to usual care, social network interventions were associated with improvements in heart failure symptom severity and quality of life among patients with heart failure and their family caregivers. The evidence base for social network interventions is based on published data only, with no recent evidence published in journals or meeting abstracts.

Cameron 2015 *(published data only)*

Carney 2004 *(published data only)*

Chattopadhay 2019 *(published data only)*

Chen 2021 *(published data only)*

ChiCTR1800015728 *(published data only)*

ChiCTR1800016096 *(published data only)*

ChiCTR-IIC-17013986 *(published data only)*

ChiCTR-INR-16009598 *(published data only)*

ChiCTR-TRC-14004972 *(published data only)*

Christie 1988 *(published data only)*

Chung 2014 *(published data only)*

Chung 2014a *(published data only)*

Clark 2016 *(published data only)*

Clements 2018 *(published data only)*

Cockayne 2014 *(published data only)*

Cole 2013 *(published data only)*

Compare 2013 *(published data only)*

Cowan 2008 *(published data only)*

Davidson 2008 *(published data only)*
Demers 2014 (published data only)

Dickens 2010 (published data only)

Dorje 2018 (published data only)

Dorje 2019 (published data only)

Doughty 2002 (published data only)

Dracup 1984 (published data only)

Dracup 1985 (published data only)

Duff 2017 (published data only)

Durant 2013 (published data only)

Elderen 1994 (published data only)

Engblom 1992 (published data only)

Euctr 2010 (published data only)

Fletcher 1987 (published data only)

Flint 2018 (published data only)

Furze 2012 (published data only)

Garcia-Lizana 2007 (published data only)

Ghajar 2018 (published data only)

Golaghaie 2019 (published data only)

Graven 2018 (published data only)

Grossmann 2008 (published data only)
Hartford 2002 (published data only)

Hasanpour-Dehkordi 2016 (published data only)

Heron 2016 (published data only)

Hooker 2018 (published data only)

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Irct201102173850N 2017 (published data only)

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Malm 2018 (published data only)

Martensson 2005 (published data only)

Mazloum 2016 (published data only)

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Rahimi 2018 (published data only)
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Reid 2013 (published data only)

Rich 1995 (published data only)

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Scherwitz 1995 (published data only)

Schraeder 2005 (published data only)

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**Gonzalez-Gonzalez 2020 (published data only)**


**Li 2018 (published data only)**


NCT03159325 (published data only)


**NCT03632018 (published data only)**


**NCT03734887 (published data only)**


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CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Aliabad 2014

Methods

Study design: RCT (individual participant allocation)
Number of centres: 1
Country: Iran
Dates study conducted: NR
Maximum follow-up: 4 months

Participants

Participants (patients)

Inclusion criteria: inclusion criteria included having CHD, reading and writing literacy, completing a rehabilitation programme in Afshar Hospital, Yazd, Iran, and presenting the informed consent form to participate in the project
Exclusion criteria: exclusion criteria included illiteracy and serious psychological problems
N randomised: total: 96; intervention: 48; comparator: 48
Diagnosis (% of participants): MI: 28.1; CABG: 44.8; PCI: 27.1; angina: NA; HF: NA; AF: NA
Post-valve replacement/repair: NA
Age (mean ± SD): intervention: 57.8 ± 8.7; comparator: 56.7 ± 9.0
Percentage male: intervention: 83.3%; comparator: 85.4%
Ethnicity: NR
Socio-economic status (income, occupational class, education):

Education level N (%):

Preliminary: comparator 24 (50.8), intervention 22 (45.8), total 46 (47.9)
High school: comparator 11 (22.9), intervention 13 (27.1), total 24 (25)
University: comparator 13 (27.1), intervention 13 (27.1), total 26 (27.1)

Participants (supporters - if available):

Relationship to patient: the patient’s spouse or the most significant person in their life
Age (mean ± SD): NR
Sex (% male): NR

References to other published versions of this review

Purcell 2021

* Indicates the major publication for the study
How identified/nominated/recruited: the patient’s spouse or the most significant person in their life was invited to participate in the last training session and required strategies to increase social support were discussed with them.

Interventions

Intervention description: "The intervention group received HAPA-based training, a booklet designed based on HAPA, and the control group received the Afshar hospital, Yazd, Iran, ordinary training and their booklet. Training was done in three sessions in the form of individual discussions with each participant by a booklet designed based on HAPA. In the first session, recognized effective motivational phase factors of the model, including risk perception, outcome expectancies, task self-efficacy, and intention were discussed. In the booklet, information about the relationship between physical activity and health in cardiac patients and benefits of physical exercise for them, also persuasive messages and reminders successful experiences of the participants during rehabilitation to increase their self-efficacy, was given to the participants. They were encouraged to decide on continuing exercise after rehabilitation. In addition, they were asked to question their potential questions for the ambiguity removal.

In the second session, volitional phase factors were discussed. The participants were asked if they have any plan to continue their physical activity after rehabilitation, if yes, they were asked to write about their action plan, including when, where, how and how often they do physical activity and with whom, in one of their booklet pages, which was designed in the form of a table. They were also asked to write, whether they have any plan overcome potential barriers while doing exercise after rehabilitation. If yes, they were to write the potential barriers and the solutions in another page, again in the form of a table. These issues were discussed with them and the importance of planning to achieve the goal was recollected to them. On another page of the booklet, the potential barriers obtained by a pilot study and the solutions were provided to them in the form of a table. To increase maintenance self-efficacy, the patients were encouraged to keep with their physical activity program, write specific and realistic goals and not to be disappointed with the problems in their program, and they were asked to write about their feeling after physical activity so that they would gain the required self-efficacy. To increase their recovery self-efficacy, they were encouraged not to be anxious about the missed days if for one reason or another, they could not continue their exercise for a few days, and not to lose their motivation and return to their program.

To involve families and increase social support, the patient’s spouse or the most significant person in their life was invited to participate in the last training session and required strategies to increase social support were discussed with them. These strategies included sharing the participants’ exercise goals; encouraging and supporting them, accompanying them while doing physical activity and doing some affairs delegated to the participants. In addition, the participants were asked to involve their family members in their physical activity program.

Theoretical underpinning: "Health Action Process Approach (HAPA). HAPA is a health behavior change model, which distinguishes between pre-intentional motivational processes leading to behavioral intention and post-intentional volitional processes leading to actual health behavior. In the motivational phase risk perception, positive outcome expectancies and perceived self-efficacy cause intention formation. When the intention is formed, to translate intention to behavior in the Volitional Phase, post-intentional factors such as planning and self-efficacy cause action initiation and maintenance."

"The present study investigates whether HAPA-based intervention together with family support increases the scores of HAPA constructs and family support in intervention group compared with the control group. Also, this study investigates whether HAPA-based intervention together with family support is effective compared with Afshar Hospital, Yazd, Iran, ordinary training in maintenance of physical activity and exercise capacity in CHD after discharge from the rehabilitation."

Type of intervention: training (HAPA) + social support

Components: training sessions x 3, education booklet

Type of support: informational, instrumental, appraisal, emotional

Support provided by: the patient’s spouse or the most significant person in their life

Setting: hospital
One-to-one/group: one-to-one
Face-to-face/remote (telephone/online): face-to-face
Time of start after event/diagnosis: end of rehabilitation
'Intensity' (no. contacts/sessions + session/contact duration): 3 x individual discussion sessions
Total programme duration: NR
Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
Adherence/fidelity assessed: NR
Co-interventions: none
Comparator description: Usual care (ordinary training + booklet in which information about factors disposing CHD and benefits of physical activity and various kinds of activity is given)
Co-interventions: none

Outcomes
Outcomes measured: physical activity, social isolation, and connectedness

Notes
Trial funding: Shahid Sadoughi University of Medical Sciences provided research funding (PhD research)
Declarations of interest: none described

Study characteristics
Methods
Study design: RCT (cluster-allocation)
Number of centres: 1
Country: Norway
Dates study conducted: January 2012 to October 2013
Maximum follow-up: 3 months

Participants
Participants (patients)
Inclusion criteria: the inclusion criteria were (1) older than 18 years, (2) history of cardiovascular disease, (3) admission to Skibotn Rehabilitation Center, (4) access to the Internet after their stay at the rehabilitation centre, and (5) possession of a personal mobile phone
Exclusion criteria: NR
N randomised: total: 69; intervention: 29; comparator: 40
Diagnosis (% of participants): numbers not specified: “The majority of the participants were referred to the cardiac rehabilitation program by their general practitioner approximately 6 months after a hospitalization for CVD, usually after myocardial infarction.”
Age (mean ± SD): intervention: 59.5 (95% CI 56.3 to 62.8); comparator: 58.8 (95% CI 55.8 to 61.7)
Percentage male: intervention: 76%; comparator: 79%
Ethnicity: NR
Socio-economic status (income, occupational class, education):
Educational attainment, mean years (95% CI): intervention: 13.4 (11.9 to 14.9); comparator: 12.4 (11.4 to 13.4)

Participants (supporters - if available):
Relationship to patient: fellow participants
Age (mean ± SD): as above
Sex (% male): as above
How identified/nominated/recruited: fellow participants

Interventions
Intervention description: All the participants were given access to the basic Internet-based intervention “ikkegideg.no” (Norwegian for “Don’t give up”), which contained general information about CVD and self-management, including information about diet, physical activity, smoking, and medication, as well as access to an online discussion forum. In the discussion forum, there were 2 levels of access. The closed group level allowed the users to create and take part in discussions that could only be accessed by those who were members of the same monthly group. In the second, open level of access, all the users were able to create, read, and take part in discussions that were visible by all the registered users of the website. The participants of the control group were also able to plan training activities, but they were not prompted to do it and they received no feedback. The participants of the tailored group had access to the same functionality as the control group as well as access to tailored content. The participants in the tailored group were required to answer more online questions than the control group, usually every 2 weeks, and they were reminded to log in through email and SMS text messages and answer the questionnaires. Based on the tailoring questionnaires, they received tailored messages via the website and SMS text messages. Depending on their stage of change, the participants were asked to plan training activities or set weekly goals. They then received feedback in the form of a simple graph on the website regarding the achievement of their goals. If the participants planned an activity, they received an SMS text message reminder shortly before the start of the planned activity. At the end of the planned activity, they received another SMS text message asking them to confirm that the activity was completed.

Theoretical underpinning: the adaptive tailoring of this intervention was based on integrative models that combined socio cognitive determinants of health behaviour with a process view, such as the Health Action Process Approach (HAPA) Transtheoretical model (TTM)
Type of intervention: multicomponent
Components: Internet education, online discussion forum
Type of support: emotional
Support provided by: fellow participants
Setting: home (online)
One-to-one/group: group
Face-to-face/remote (telephone/online): online
Time of start after event/diagnosis: 4 weeks
'Intensity' (no. contacts/sessions + session/contact duration): NR
Total programme duration: 3 months
Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: The participants in the tailored group were required to answer more online questions than the control group, usually every 2 weeks, and they were reminded to log in through email and SMS text messages and answer the questionnaires. Based on the tailoring questionnaires, they received tailored
messages via the website and SMS text messages. Depending on their stage of change, the participants were asked to plan training activities or set weekly goals. They then received feedback in the form of a simple graph on the website regarding the achievement of their goals. If the participants planned an activity, they received an SMS text message reminder shortly before the start of the planned activity. At the end of the planned activity, they received another SMS text message asking them to confirm that the activity was completed.

Adherence/fidelity assessed: website usage, intervention = 25.6%, 24% controls at 1 year from baseline

Co-interventions: none

Comparator description: same as intervention without the tailoring and feedback aspects

Co-interventions: none

Outcomes

Outcomes measured: psychological well-being, physical activity, social isolation and connectedness

Notes

Trial funding: Northern Norway Regional Health Authority (Helse Nord RHF, ID 3342/HST986-10)

Declarations of interest: none described
**Age (mean ± SD):** intervention: 60.2 ± 8.1; comparator: 63.3 ± 9.1

**Percentage male:** intervention: 0%; comparator: 0%

**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):** NR

**Participants (supporters - if available):**

**Relationship to patient:** fellow patients/participants

**Age (mean ± SD):** see above

**Sex (% male):** see above

**How identified/nominated/recruited:** recruited from the Women's Heart Clinic at the Royal Brompton & Harefield NHS Trust, those randomised to support group could pick their NHS site

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**Interventions**

**Intervention description:** The support group attended 12 monthly group meetings, designed to provide a supportive environment small enough to encourage full interaction, in accordance with current support group recommendations. In line with other support groups, an ethic was applied as a code of conduct, in order to promote an atmosphere of tolerance, understanding, and mutual respect. Groups with identical content were held at both the Royal Brompton and Harefield NHS Foundation Trust sites, the Royal Brompton Hospital, London and the Harefield Hospital, Uxbridge, in order to reflect the geographical location of the majority of the patient population. All patients were free to indicate their group preference. Group meetings were scheduled to run for 90 minutes. The monthly meetings were designed to reflect the needs of the participants involved. At the first group meeting, participants were questioned regarding their expectations for the group, thus empowering the members with a sense of group ownership and responsibility. Groups were run by one of two known conveners, in order to maintain continuity and provide a point of contact for the group. Guest speakers addressed the group on associated topics (exercise, diet, identifying stress, relaxation training, medication) every other month, with the interim meetings providing an opportunity for discussion, reflection, and support.

**Theoretical underpinning:** no – the support group attended 12 monthly group meetings, designed to provide a supportive environment small enough to encourage full interaction, in accordance with current support group recommendations

**Type of intervention:** social support only

**Components:** 12 monthly group meetings with education and social support

**Type of support:** emotional

**Support provided by:** fellow intervention group participants

**Setting:** hospital (centre-based)

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** average symptom history of 8.0 (± 5.9) years

**'Intensity' (no. contacts/sessions + session/contact duration):** 12 sessions, 90 minutes

**Total programme duration:** 12 months

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** average support group attendance 70% (range 91% to 52%)

**Co-interventions:** none
Asbury 2011 (Continued)

Comparator description: usual care
Co-interventions: none

Outcomes
Outcomes measured: HRQoL, psychological well-being, social isolation, and connectedness

Notes
Trial funding: unfunded
Declarations of interest: none described

Bakan 2008

Study characteristics

Methods
Study design: RCT (individual participant allocation)
Number of centres: single-centre
Country: Turkey
Dates study conducted: January to June 2005
Maximum follow-up: 3 months

Participants

Participants (patients)
Inclusion criteria: inclusion criteria for participants were literacy, ability to communicate verbally, diagnosis of HF at least 6 months before for the study, New York Heart Association (NYHA) functional class II–III (Table 1), ejection fraction < 40%, no hearing or visual defect, no mental disorder, no myocardial infarction in the past year, and plans to remain in the city during the study period or could be reached by telephone
Exclusion criteria: "Exclusion criteria limited the number of patients participating." (but not explicitly reported)

N randomised: total: 44; intervention: 22; comparator: 22
Diagnosis (% of participants): MI: NA; CABG: NA; PCI: NA; angina: NA; HF: 100%; AF: NA; post-valve replacement/repair: NA
Age (mean ± SD): intervention: 62.67 ± NR; comparator: NR
Percentage male: intervention: 38.1%; comparator: 40.9%
Ethnicity: NR

Socio-economic status (income, occupational class, education):

Education:
Literate/primary school: intervention 47.6%; comparator: 50%
Middle school: intervention 28.6%; comparator: 31.8%
High school: intervention 14.3%; comparator: 13.6%
University: intervention: 9.5%; comparator: 4.5%

Participants (supporters - if available):
Relationship to patient: spouse or partner
Age (mean ± SD): NR
Sex (% male): NR
**How identified/nominated/recruited:** patients were encouraged to attend with their spouse or partner

**Intervention description:** OVERALL:

“The intervention programme consisted of two one-to-one counselling sessions (clinical appointments) with patients, two phone calls and one group meeting over a 3-month period. Throughout the programme, patients were encouraged to attend with their spouse or partner.” [...] “Clinical appointments included one-to-one patient counselling and HF education by the researchers. At the first appointment each patient in the intervention group was given a booklet, titled ‘How Can I Learn to Live with Heart Failure’, developed by the investigator. This included information on medications; definition of HF; symptoms; types of exercise; the walking schedule for the programme; important points on diet; a sample diet list; cholesterol; liquid intake; tobacco and alcohol consumption; and contact details for the clinic. Patients were also given a crossword puzzle about HF; a schedule of appointment and education sessions; and a calendar on which to record weight on a daily basis. The booklet focuses on supporting patients in adhering to their treatments, adjusting medications and doing exercise. The education materials taught patients to recognize the symptoms of HF and to contact the investigator and medical staff if early sign or symptoms of worsening HF occurred.” [...] “Patients were encouraged to engage in regular exercise and advised that it is safe to exercise up to the level of moderate discomfort (e.g. fatigue of the leg muscles, dyspnoea or angina).” "Self monitoring techniques (e.g. recording daily weight) and positive verbal feedback were also part of the intervention.” “The [one-on-one] interview consisted of establishing specific goals with patients related to healthier diet, increased quality and amount of exercise and increased social and interpersonal activities. The focus of the interview was on goal setting and individualizing health life-style changes for participants. Advice was reinforced at each subsequent clinic visit during one-on-one counselling sessions by the investigator.”

Group element: “A group education session was offered at 1 month. This session included explanation of monitoring of daily body weight, plan of action if weight changed, effects of medications, importance of compliance and recommendations regarding exercise and diet. For this purpose, a PowerPoint presentation was given to patients. After this, patients shared their experiences. Some patients participated with their relatives and partners in the group session.”

**Theoretical underpinning:** Roy's adaptation model (RAM), in turn based on general system theory

“The RAM focuses on environmental stimuli and the bio-psycho-social responses to the stimuli, and emphasizes the interaction between the person and the environment as the person adapts to environmental stimuli. The RAM is one of the most fully developed and widely used of all nursing conceptual models.”

Includes section defining social support and how this impacts adjustment to chronic illness

**Type of intervention:** multicomponent

**Components:** one-to-one counselling, phone follow-up (with HP, education/Q&A), group support session, booklet

**Type of support:** NR

**Support provided by:** others in group with same condition; spouse/partner

**Setting:** hospital

**One-to-one/group:** one-to-one and group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** group session offered at 1 month

**'Intesity' (no. contacts/sessions + session/contact duration):** 2 face-to-face counselling sessions + 2 phone calls + 1 group session (time NR)

**Total programme duration:** 3 months
### Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:
"The investigator provided additional information to the patient based on the patient’s interest in specific topics or questions raised during the session."

### Adherence/fidelity assessed: NR

### Co-interventions: none

### Comparator description: usual care

### Co-interventions: none

#### Outcomes measured:
- all-cause hospital admission, HRQoL, risk factors, social isolation and connectedness

#### Notes
- **Trial funding:** NR; "Patient education materials were printed by Pfizer medicine firm."
- **Declarations of interest:** NR

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### Berkman 2003

#### Study characteristics

<table>
<thead>
<tr>
<th>Study design</th>
<th>RCT (individual participant allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centres</td>
<td>8</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td>Dates study conducted</td>
<td>October 1996 to October 1999</td>
</tr>
<tr>
<td>Maximum follow-up</td>
<td>4 years (minimum 18 months, average 29 months)</td>
</tr>
</tbody>
</table>

#### Participants

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>all patients with an acute MI admitted to the participating hospitals were considered for enrolment. The criteria for acute MI required characteristic elevation in 1 or more biomarkers of myocardial injury to twice the institution-specific upper limit, except for creatine kinase-MB fraction, for which any elevation with a rising and falling pattern deemed indicative of acute MI by the attending physician was considered acceptable. Symptoms compatible with acute MI or characteristic evolutionary ECG ST-T changes or new Q waves were also required.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusion criteria</td>
<td>patients with acute MI following PCI or CABG surgery or those receiving psychotherapy for depression were excluded. Before April 1998, patients were also excluded if they were taking an antidepressant medication. In April 1998, the protocol was changed to allow enrolment of patients who were taking an antidepressant for longer than 14 days but remained depressed. Patients were also excluded if they had noncardiac conditions likely to be fatal within 1 year; were too ill to participate; were participating in another research protocol that posed a significant logistic burden or that might confound evaluation of the Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) intervention; had major psychiatric comorbidity (including schizophrenia, bipolar disorder, severe dementia, or active substance abuse); were at imminent risk for suicide; refused to participate, or their attending physician disallowed participation; could not be enrolled within 28 days of the acute event; or were inaccessible for intervention or follow-up</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N randomised</th>
<th>total: 2481; intervention: 1238; comparator: 1243</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis (% of participants)</td>
<td>MI: 100%; CABG: NA; PCI: NA; angina: NA; HF: NA; AF: NA; post-valve replacement/repair: NA</td>
</tr>
</tbody>
</table>
Disease (Review)

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

Berkman 2003 (Continued)

Age (mean ± SD): intervention: 61 ± 12.6; comparator: 61 ± 12.5

Percentage male: intervention: 56%; comparator: 57%

Ethnicity: non-white: intervention: 33%; comparator: 34%

Socio-economic status (income, occupational class, education):
Education: high school or higher – intervention: 48%; comparator: 46%

Participants (supporters - if available):
Relationship to patient: others participating in the trial

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: trial participants

Interventions

Intervention description: for depressed patients, CBT was given as described by Beck et al and Beck. For patients with low perceived social support (LPSS), CBT techniques were used to address the cognitions, behaviours, and affect that accompany LPSS, supplemented with techniques based on social learning theory and adopted from other psychotherapeutic support trials. For patients with LPSS, a detailed assessment of the patient's social needs, relationships, and deficits was performed during the first therapy session, including assessment of participants' social planning, communication, and problem-solving skills and social anxiety or phobia. Counselling sessions were tailored to address patients' specific needs through the use of modular intervention components that addressed (1) behavioural and social skill deficits, (2) cognitive factors that contribute to the perception or maintenance of unsatisfying levels of social support, and (3) social outreach and network development. The major thrust of the intervention was on strengthening network ties to be more functional, supportive, and satisfying, although sometimes patients were encouraged to create new relationships. Patients with both depression and LPSS received an intervention in which elements of both treatments were integrated across treatment sessions. A detailed description of the depression and social support interventions is provided elsewhere.

The group modality was used to reinforce and extend progress made during individual therapy, provide a setting for rehearsal of new skills, foster social support, and normalise experiences and concerns related to the MI. Group members also benefited from opportunities to exchange advice and suggestions for coping with heart disease and other stressors. Participation in the group component of the intervention was contingent on the availability of a group within the 6-month limit of the patient’s treatment window. Other requirements included the lack of any contraindications for group participation (e.g. a pattern of antisocial behaviour that would harm other group members), and willingness to be involved with group participation. A participant could be enrolled into a group anytime after 3 individual sessions had been completed, but no later than 6 months after enrolment. Group sessions lasted for 2 hours and ran for 12 weeks. Hence, the full course of psychosocial treatment could last up to 9 months in exceptional cases. Patients could be seen in both individual and group therapy either sequentially or concurrently, depending on such factors as the availability of a group and the patient’s readiness to participate in one.

The groups comprised approximately 5 to 8 participants. Members included those with depression, LPSS, or both, and the cultural diversity of the population resulted in groups comprised of members with wide-ranging backgrounds. Sessions began with a 15-minute relaxation practice, followed by announcements, setting of an agenda, and discussion of homework and participants’ experiences of the past week (35 to 40 minutes), building on work done in individual treatment. The group then spent approximately 1 hour focusing on one of the 12 substantive topics described in the curriculum, including assertiveness training, life goals and planning, and enhanced efficacy dealing with life circumstances. A brief review of the session’s main point, assignment of homework tasks, participant feedback, and a preview of the next session completed the session.

Theoretical underpinning: ‘cognitive-behavioural and social learning approaches’

CBT and other social learning approaches served as the basis for the intervention. In earlier clinical trials, CBT has been found to be as effective as imipramine in the treatment of depression. In
addition, these approaches have been shown to be an effective treatment for depression for older adults, for those with severe depression, and for minorities, when the therapist has sufficient cultural sensitivity. For patients who are depressed, socially withdrawn with poor social skills, or both, these approaches have been found superior to other approaches. As relatively brief goal-oriented, collaborative, and emotionally supportive forms of treatment, cognitive-behavioural and social learning approaches are generally well accepted by cardiac patients. They can be adapted to the mild-to-moderate depressions commonly observed in this population, and to those issues that contribute to a subjective sense of low social support. In addition, cognitive-behavioural group therapy has been found effective in the treatment of major depression, minor depression, and psychological distress. It has been widely used in work with chronic medical populations, and is particularly well suited to patients with CHD.

The negative impact of depression and low perceived social support on post-MI prognosis underscores the need for interventions to address these problems

**Type of intervention:** multicomponent

**Components:** individual CBT (1 hour, weekly, though shorter or more frequently if needed, ranging 6 sessions to 6 months depending on progress) + group if available (2 hours for 12 weeks) + those assigned to intervention also received adjunctive pharmacotherapy if needed for severe or unremitting depression (sertraline)

**Type of support:** appraisal + emotional

**Support provided by:** other trial participants with same condition

"Therapists were trained by study psychologists and trainers from the Beck Institute for Cognitive Therapy and Research. The Beck Institute also monitored quality and adherence to the treatment protocol by evaluating randomly selected therapy session audiotapes."

**Setting:** NR

**One-to-one/group:** group (+ one to one with health professional)

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** a participant could be enrolled into a group any time after 3 individual sessions had been completed, but no later than 6 months after enrolment

'Intensity' (no. contacts/sessions + session/contact duration): 2 hours for 12 weeks (group only)

**Total programme duration:** maximum 6 months (individual sessions + group; 12 weeks for group only)

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: agenda of each meeting set as per group members needs

**Adherence/fidelity assessed:** adherence to the treatment protocol was documented on standardised treatment data logs. Additionally, a set of process measures was used to track clinical progress and patient engagement, and a variety of cognitive-behavioural assessment tools (e.g. dysfunctional thought records, activity logs, coping cards, and homework forms) were provided to the counsellors to use as needed. All sessions (both individual and group) were audiotaped, and systematic reviews of these audiotapes and case information served as the basis of weekly, site-based supervision. Beck Institute staff audited tapes of approximately 20% of the therapy sessions.

**Co-interventions:** "Interventions other than the ENRICH D intervention are not restricted by the protocol and are considered part of usual care. Participants taking an antidepressant medication before randomization are eligible for enrollment if they have been taking it for ≥14 days and still meet eligibility criteria. It is anticipated that some patients will be given medication and/or referred to cardiac rehabilitation or to support groups by their physicians as part of usual care. Although main analyses use an intention-to-treat approach, the effect of these co-interventions will be systematically evaluated”.

**Comparator description:** usual care (as provided by their physician)
**Study characteristics**

**Methods**

- Study design: RCT (individual participant allocation)
- Number of centres: 2
- Country: Sweden
- Dates study conducted: August 1996 to January 2000
- Maximum follow-up: 2 years

**Participants**

- **Participants (patients)**
  - Inclusion criteria:
    - Hospitalised for MI, PTCA, CABG
    - Able to attend all planned 20 sessions during the 1-year intervention
  - Exclusion criteria:
    - Women over 75 years
    - Could not communicate in Swedish
    - Participation in another research study
    - Did not belong to hospital catchment area
    - Co-morbidity that would preclude participation, e.g. malignancy or psychiatric disease
  - N randomised: total: 235; intervention: 113; comparator: 122
  - Diagnosis (% of participants): MI: 44%; CABG: 21%; percutaneous transluminal coronary angioplasty (PTCA): 15%; combination of MI, PTCA, CABG: 20%
  - Age (mean ± SD): intervention: 61.5 ± 8.9; comparator: 62.5 ± 8.7
  - Percentage male: intervention: 0%; comparator: 0%
  - Ethnicity: NR
  - Socio-economic status (income, occupational class, education):
    - Elementary (9 years): 63.1% intervention, 61.5% control
    - High school (12 years): 25.2% intervention, 24% control
    - University (> 12 years): 11.7% intervention, 14.4% control
  - **Participants (supporters - if available):**
    - Relationship to patient: fellow patient/participant
  - Age (mean ± SD): see above
Interventions

**Intervention description:** The programme consisted of 20 x 2-hour sessions during 1 year. The first 10 sessions were held weekly and the rest once a month thereafter. The intervention groups consisted of 4 to 8 patients, and every session introduced a new theme, and patients were given various strategies to rehearse between sessions. The agendas covered specific topics, which were introduced through written text, case illustrations, slides, films, audio, and videotapes. The women had homework assignments between sessions consisting of both general and individual tasks. The therapy included education and discussions, and each session started with several minutes of relaxation, which was practised and applied as a technique for coping with stress. The initial session was focused on educating patients about CAD and how it is affected by an unhealthy lifestyle. In addition, patients were educated about the physiological responses to stress. The subsequent sessions were aimed at identifying physical, cognitive, affective, and behavioural stress responses and addressed modification strategies using a cognitive–behavioural approach. These included replacing negative and irrational thoughts with alternative ones, practising a relaxed behaviour style as opposed to a type-A behaviour, assertive communication, and developing strategic problem-solving skills. Furthermore, the session material was designed to illustrate stressors, coping skills, and stress reactions including irritability, hostility, anger, anxiety, vital exhaustion, and depressive symptoms. Among the topics addressed were stress reactions that might be more common among women, including coping with the challenge of both employed and the main caregiver in the family, or having elderly parents, grandchildren, or other family members to care for. Social support from the group members was also utilised to facilitate therapeutic progress, and patients were encouraged to increase their network.

**Theoretical underpinning:** the stress management programme was based on cognitive behavioural principles with various strategies to be practised between every session

**Type of intervention:** multicomponent

**Components:** education, meetings, homework, social support

**Type of support:** instrumental + emotional

**Support provided by:** peer supporter

**Setting:** centre-based

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 62 days average time between enrolment and baseline assessments; 49 days average time between baseline and start of intervention

**‘Intensity’ (no. contacts/sessions + session/contact duration):** 20 x 2-hour sessions

**Total programme duration:** 1 year

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** Attendance rates:
- 84.8% (95) attended 15/20 sessions
- 5.4% (6) attended 5 to 15 sessions
- 5.4% (6) attended fewer than 5 sessions
- 4.5% (6) attended no sessions

**Co-interventions:** none

**Comparator description:** usual care

**Co-interventions:** none
### Blom 2009 (Continued)

#### Outcomes

**Outcomes measured:** psychological well-being, heart disease risk factors, social isolation and connectedness

#### Notes

**Trial funding:** this study was supported by grants from the Ansgarius Foundation, the Belven Foundation, the Swedish Heart and Lung Foundation, the Public Health Committee, as well as EX-PO-95 of Stockholm County Council, the Swedish Medical Research Council (project 19X11629), the Vardal Foundation, all in Stockholm, Sweden

**Declarations of interest:** none described

### Boese 2013

#### Study characteristics

**Methods**

- **Study design:** RCT (individual participant allocation, wait-list control)
- **Number of centres:** NR
- **Country:** Germany
- **Dates study conducted:** 2009
- **Maximum follow-up:** 12 months

**Participants**

**Participants (patients)**

**Inclusion criteria:**

- Coronary heart disease
- Depressive symptoms (HADS > 7)
- Insurants of former Kaufmännische Krankenkasse (KKH)-Allianz
- German speaking
- At least 18 years old
- Written informed consent

**Exclusion criteria:**

- Hardness of hearing
- Severe somatic illness
- Current severe depressive episode or current suicidal tendency
- Severe mental illness (dementia, psychosis)

**N randomised:** total: 108; intervention: 54; comparator: 54

**Diagnosis (% of participants):** mixed CHD population, % indication NR

**Age (mean ± SD):** intervention: 63 ± 10.74; comparator: 61.7 ± 9.45

**Percentage male:** intervention: 0%; comparator: 0%

**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):**

- Job qualification:
  - Intervention group:
    - None 11%
    - Vocational training 74%
University degree 7%
Other 7%

Wait-list control group:
None 11%
Vocational training 73%
University degree 10%
Other 6%

Participants (supporters - if available):

Relationship to patient: peers

Age (mean ± SD): 63.6 ± 7.3 years

Sex (% male): 0%

How identified/nominated/recruited: 11 peer supporters were recruited from the subset of women who were not eligible to participate due to lack of a current depressive episode in the screening phase and who indicated interest in offering peer support

Interventions

Intervention description: The telephone-based support was provided by the 11 supporters that were trained for the intervention. They learned techniques of empathic listening, to express understanding, compassion and resource-oriented encouragement with the aim of improving the perceived social support of their conversation partners and thus alleviating their levels of distress. The supporters were also introduced to validation techniques. In addition, they were instructed, in the sense of practical support, to encourage the conversation partners to seek and make use of instrumental support (e.g. to ask for help from caregivers). Furthermore, the supporters received relevant information on coronary heart disease and depression in order to be able to offer informational support by passing on important information to the interviewees, giving advice and also motivating them to change their health behaviour (more exercise, better nutrition, adherence to medication, techniques for coping with stress).

The participants could contact the supporters during daily telephone hours according to their needs and time resources. They were asked to make use of the offer at least once per week for 1 month. The participants could use the offer anonymously but were asked to state their number code during a counselling interview. They aimed to have continuity between participants and supporters and asked the participants, if they felt comfortable during their first phone contact, to call again during the specific phone hours of the supporter they had talked to.

The supporters were contacted once per week by the study psychologist for co-ordination and supervision and had the possibility to contact her in difficult situations.

Theoretical underpinning: NR

Type of intervention: social support only

Components: telephone calls with peer supporter, one telephone call with psychologist

Type of support: informational + emotional

Support provided by: peer supporter trained on attentive listening and sharing experiences

Setting: home

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): remote (telephone)

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): NR

Total programme duration: 6 months
Boese 2013 (Continued)

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: yes
Adherence/fidelity assessed: NR
Co-interventions: none
Comparator description: wait-list control – received intervention after 6 months
Co-interventions: none

Outcomes

Outcomes measured: psychological well-being, social isolation and connectedness, HRQoL

Notes

Trial funding: this work was supported by the KKH Health Insurance

Declarations of interest: Christoph Herrmann-Lingen is receiving royalties from Hogrefe Huber Publishers for the German version of the Hospital Anxiety and Depression Scale. During the last 3 years, he has received lecture honoraria from Pfizer and Novartis and research support from the German Ministry of Education and Research (BMBF), the European Union, and the German Research Fund (DFG). Susanne Bock, Birgit Kielblock and Elisabeth Siegmund-Schultze have been employed by the KKH statutory Health Insurance while the study was conducted. The other authors declare that they have no conflict of interest.

Carroll 2006

Study characteristics

Methods

Study design: RCT (individual participant allocation, 3 arms)
Number of centres: 3
Country: USA
Dates study conducted: NR
Maximum follow-up: 12 months but only 12 weeks reported in the paper

Participants

Participants (patients)

Inclusion criteria: potential participants were approached if they were over the age of 65 years, were unpartnered (i.e. widowed, divorced, never married, and not in a relationship), had a telephone in their home and were able to speak and understand English

Exclusion criteria: NR

N randomised: total: 132; intervention: 46; comparator 1 (nurse support): 43; comparator 2 (standard care): 43

Diagnosis (% of participants):
MI: 100% (all joined study following MI)

Age (mean ± SD): intervention: 75.8 ± 6.5; comparator 1: 74.9 ± 6.3; comparator 2: 77 ± 7.1

Percentage male: intervention: 32.6%; comparator: 32.6%; comparator: 30.2%

Ethnicity:
Caucasian:
Intervention 98%
Comparator (nurse) 98%
Comparator (standard care) 95%

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)
Copyright © 2023 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
Socio-economic status (income, occupational class, education):
High school graduate plus:
Intervention 67%
Comparator (nurse) 63%
Comparator (standard care) 79%

Participants (supporters - if available):
Relationship to patient: peer advisor
Age: 60+
Sex (% male): NR

How identified/nominated/recruited: intervention: the peer advisor was a “graduate” of a local cardiac rehabilitation programme. The peer advisor was over the age of 60 years, had to have a history of MI, was willing to participate in the training programme, and was actively participating in the wellness activities that were taught in the cardiac rehabilitation programme.

Interventions
Intervention description: The peer advisor used their first-hand experience to become a credible role model with verbal persuasion. The peer advisor was a “graduate” of a local cardiac rehabilitation programme. The peer advisor was over the age of 60 years, had to have a history of MI, was willing to participate in the training programme, and was actively participating in the wellness activities that were taught in the cardiac rehabilitation programme. There were 8 peer advisors who completed the peer advisor training and actually performed the role of peer advisor. Each peer advisor was trained based on the premise that the strength of the intervention was in the peer advisor’s ability to identify with the people they are helping. The peer advisor was encouraged to share personal experiences and information with participants during telephone contact but was warned to avoid sharing clinical information or health advice. Frequent contact was maintained with the peer advisor by an APN associated with the study. Subjects assigned to the peer advisor group received a telephone call from the peer advisor once a week for the 12 weeks after discharge from the hospital.

Theoretical underpinning: social cognitive theory
Type of intervention: social support only
Components: telephone support
Type of support: informational + appraisal + emotional
Support provided by: peer advisor
Setting: home
One-to-one/group: one-to-one
Face-to-face/remote (telephone/online): remote (telephone)
Time of start after event/diagnosis: NR
'Intensity' (no. contacts/sessions + session/contact duration): 1 phone call per week
Total programme duration: 12 weeks
Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
Adherence/fidelity assessed: NR
Co-interventions: none
Comparator description:
1) Advanced practice nurse:
The APN utilised their knowledge base of cardiovascular disease, verbal persuasion, and symptom management techniques to reduce physiological arousal to influence participants’ beliefs about performing recovery behaviours. The APN was a masters prepared clinical nurse specialist with a specialisation in cardiovascular nursing. The APN followed a caseload of participants during the intervention period. There were 3 APNs that provided the self-efficacy intervention during this study. The APNs worked together to standardise the intervention. The APN provided intervention strategies that included verbal persuasion, additional patient education to meet specific learning needs, and shared strategies to manage physiological arousal that may cause symptoms, and negative emotional responses. Participants assigned to the APN group received a telephone call from the APN once a week for the 12 weeks after discharge from the hospital.

2) Standard care:
At all 3 medical centres, standard care consisted of discharge instructions provided by the clinical nurse. Discharge instructions included a review of medications, diet, physical activity, symptom management, and follow-up appointments. No further contact with the clinical nurse was available to the participants in this study.

Co-interventions: none

Outcomes measured: psychological well-being, physical activity

Notes
Trial funding: funding for this study was from the National Institute of Nursing Research Grant (R15 NR04255) and the Charles Farnsworth Trust

Declarations of interest: none described
Less than high school – total: 19%, comparator: 20%, intervention: 19%
High school - total: 36%, comparator: 36%, intervention: 39%
Some college - total: 19%, comparator: 20%, intervention: 16%
College graduate - total: 26%, comparator: 24%, intervention: 26%

Household Income (n=215)
Lower than USD $25,000 - total: 54%, comparator: 50%, intervention: 58%
$25,000 - $40,000 - total: 26%, comparator: 28%, intervention: 23%
$41,000 - $63,500 - total: 12%, comparator: 15%, intervention: 9%
More than $64,000 - total: 8%, comparator: 7%, intervention: 10%

Participants (supporters - if available):

Relationship to patient: peer advisor and an advanced practice nurse

Age: 60+

Sex (% male): NR

How identified/nominated/recruited: peer advisors were recruited from cardiac rehabilitation programmes on the east and west coasts of the United States

Advanced practice nurses were employed

Intervention description: building on previous work with peer advisors and advanced practice nurses, this study’s intervention used social support and self-efficacy enhancement interventions to improve the physical and mental health of unpartnered older cardiac adults. Emphasis in this community-based collaborative intervention was on self-efficacy enhancement and the indigenous social support provided by both the peer advisor and the advanced practice nurse. The advanced practice nurse made a home visit and contacted the participants over the telephone at least 3 times during the intervention, whereas the peer advisor made weekly calls to the participants for 12 weeks. To provide a comprehensive, standardised approach, the research team identified key strategies to foster a successful recovery and shared these strategies to provide the most beneficial partnership with the older adult. These strategies, which included verbal encouragement and support, active listening, sharing by the peer advisors of their experiences, reinterpretation of symptoms, exercise promotion, energy management, and teaching about the cardiac disease process, have been reported in other publications.

Theoretical underpinning: social cognition theory

Type of intervention: social support

Components: social support with nurse (primarily informational), social support with peer advisor (primarily emotional)

Type of support: informational + appraisal + emotional

Support provided by: 45 peer advisors were trained according to a programme outlined by Robinson and colleagues

Advanced practice nurse: both nurses were master’s prepared and clinical experts in cardiovascular nursing

Setting: home

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): telephone

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): Peer advisor: weekly telephone calls for 12 weeks
Advanced practice nurse: 3 telephone calls over the 12 weeks
Carroll 2007 (Continued)

- **Total programme duration:** 12 weeks
- **Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
- **Adherence/fidelity assessed:** NR
- **Co-interventions:** none
- **Comparator description:** standard care
- **Co-interventions:** none

**Outcomes**

- **Outcomes measured:** all-cause mortality, cardiovascular hospital admission

**Notes**

- **Trial funding:** this study was funded by a grant from the National Institute of Nursing Research (RO1 NR05205) awarded to Sally H. Rankin, PhD, RN, FAAN
- **Declarations of interest:** none described

Clark 2000

**Study characteristics**

**Methods**

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** 6
- **Country:** USA
- **Dates study conducted:** NR
- **Maximum follow-up:** 12 months

**Participants**

- **Participants (patients)**
  - **Inclusion criteria:** aged > 60 years, diagnoses with cardiac disease treated daily by at least one medication, and seen by a physician—every 6 months; cardiac disease defined as any condition directly involving the heart (e.g. arrhythmia, angina myocardial infarction, valvular disease)
  - **Exclusion criteria:** hypertension the only diagnosis, if physicians felt they would not be able to benefit fully from the programme due to other medical reasons (e.g. terminal illness and significant hearing loss)
  - **N randomised:** total: 571; intervention: 309; comparator: 262
  - **Diagnosis (% of participants):** MI: 39%; CABG: 0%; PCI: 0%; angina: 45%; HF: 22%; AF: 59% (arrhythmias); post-valve replacement/repair: 25%
  - **Age (mean ± SD):** total reported only: 71.9 (range 60 to 93)
  - **Percentage male:** intervention: 0%; comparator: 0%
  - **Ethnicity:** total reported only; Caucasian 87%; African American 12%; other minorities 1%
  - **Socio-economic status (income, occupational class, education):** 78.8% graduated from high school 5% had less than 8th grade education
  - **Participants (supporters - if available):**
  - **Relationship to patient:** no relationship
  - **Age (mean ± SD):** NR
Sex (% male): NR

How identified/nominated/recruited: “Peer leaders were selected graduates of the program who had received additional training.”

Interventions

Intervention description: PRIDE education programme (adapted from an initial version designed for both men and women). PRIDE problem-solving process: Problem identification, Researching one’s routine, Identifying a management goal, Developing a plan to reach it, Expressing one’s reactions.

Women were given the latitude to choose any type of management problem to resolve. In general, the programme recommended a comprehensive approach to managing the heart condition: using medicines as prescribed, following dietary recommendations, obtaining adequate exercise. Physical activity was used as the modal problem for learning the PRIDE process. Every participant provided information (i.e. signs and symptoms of heart disease, effective communication with the physician) and assistance to be more self-evaluating and active, e.g. used a pedometer to log physical activity and provided an exercise tape designed for older female heart patients.

Groups of 6 to 8 women met for 2 to 2.5 hours per week for 4 weeks. During the intervening days, women used a workbook at home as a guide to carrying out the PRIDE steps. 49 sessions of 4 classes each were held at 6 sites in or near participating hospitals. Trained health educators using standardised educational protocols facilitated classes. Health educators received training on the programme content and process and were supervised by a lead health educator. Peer leaders were selected graduates of the program who had received additional training, Instructional materials tailored to women’s interests were utilised in the programme in addition to the workbook, including handouts summarising class discussions and daily self-monitoring logs for observing one’s own activities over the 4 weeks. Either a health educator or peer leader made weekly motivational telephone calls to each woman over the programme implementation period. Three months following the programme, participants were sent a motivational letter and additional monitoring logs. Six months following the programme, women received a motivational phone call from a peer leader.


Social cognitive theory

Type of intervention: multicomponent

Components: education meetings, motivational telephone calls

Type of support: informational + instrumental + appraisal + emotional

Support provided by: trained health educator and/or trained peer leader

Setting: NR

One-to-one/group: group (6 to 8 women)

Face-to-face/remote (telephone/online): face-to-face meetings, with 1 motivational follow-up letter and 1 follow-up motivational telephone call

Time of start after event/diagnosis: NR

‘Intensity’ (no. contacts/sessions + session/contact duration): weekly group meetings for 2 to 2.5 hours

Total programme duration: 4 weeks + motivational letter 3 months after completion and motivational phone call at 6 months after completion

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: no

Adherence/fidelity assessed: no

Co-interventions: none
**Clark 2000 (Continued)**

**Comparator description:** usual care

Control group members saw their physicians at the intervals specified by the particular physician and received any information or communication that would be provided as part of routine care in that setting.

**Co-interventions:** none

**Outcomes**

**Outcomes measured:** all-cause mortality, psychological well-being, social isolation and connectedness

**Notes**

**Trial funding:** this research was supported by Grant 5-R01-HL38083 from the National Heart, Lung, and Blood Institute

**Declarations of interest:** NR

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**Colella 2018**

**Study characteristics**

**Methods**

**Study design:** RCT (individual participant allocation)

**Number of centres:** 3

**Country:** Canada

**Dates study conducted:** 2007 to 2009

**Maximum follow-up:** 12 weeks

**Participants**

**Participants (patients)**

**Inclusion criteria:** (1) English speaking, (2) ≥ 35 years of age, (3) undergoing first-time traditional (sternotomy approach with cardiopulmonary bypass) (CABG), (4) uncomplicated in-hospital post-operative course, (5) standard length of hospital stay (4 to 8 days), (6) telephone in the home, (7) able to hear telephone conversation

**Exclusion criteria:** (1) cardiac surgery problems, (2) discharge to nursing home/long-term care facility, (3) neurological or psychiatric disorders that could impede self-reflection or communication, (4) emergency surgery, (5) significant in-hospital post-surgical complications (e.g. deep wound infection, renal failure, re-operation, major stroke) that extended length of hospital stay beyond 8 days

**N randomised:** total: 209; intervention: 69; comparator: 140

**Diagnosis (% of participants):** CABG: 100%

**Age (mean ± SD):** intervention: 63.6 ± 9.9; comparator: 63.4 ± 10.7

**Percentage male:** intervention: 100%; comparator: 100%

**Ethnicity:** White 84.9%; Black 0.5%; First Nations (0.5%); South Asian (3.8%); East Asian (2.7%); Other (7.6%)

**Socio-economic status (income, occupational class, education):**

Income:
- < CAD $20,000 annually 2.2%
- CAD $20,000 to $39,999 38.9%
- > CAD $60,000 42.8%
- Declined answer 16.2%
Education:
- Grade school or less 10.3%
- Some high school 18.3%
- High school graduate 18.4%
- Some post-secondary 11.4%
- Post-secondary graduate 28.1%
- Graduate degree 13.5%

Participants (supporters - if available):
- Relationship to patient: no relationship - peer supporters
- Age (mean ± SD): NR
- Sex (% male): 100%

How identified/nominated/recruited: Peer volunteers who underwent successful CABG at least 1 year previously. Recruitment facilitated through letters/posters displayed at outpatient CR programmes and hospitals. Peer volunteers completed a 6-hour training session on development of skills required for telephone support such as developing and building rapport, active listening, sharing experiences, boundary setting, peer scope and criteria for referral to a nurse practitioner.

Interventions

Intervention description: after baseline data collection and randomisation, intervention group were matched with a peer volunteer based on age (± 5 years) and cultural background as much as possible. Telephone contact was initiated by the peer within 3 to 4 days following hospital discharge. The peer volunteers booked weekly telephone calls over 6 weeks and documented their activities using an activity log. Peer volunteers provided support to no more than 2 patients at a time to maintain intervention fidelity and prevent volunteer fatigue.

The support that the peer volunteer provided may have encompassed the following:

Informational (i.e. the provision of knowledge relative to problem-solving; information regarding recovery norms, normalising of physiological and psychological symptoms, in the form of factual input, relevant resources, advice, suggestions and feedback)

Appraisal (i.e. affirmative social learning theory involving the communication of information that is pertinent to self-evaluation; the appropriateness of emotions, cognitions and behaviours; encouragement to persist in problem resolution, reassurance that efforts will result in positive outcomes relative to physiological and psychosocial outcomes)

Emotional (i.e. esteem-enhancing support that provides the individual with emotional support to counteract the doubts about their own ability; the provision of information and support regarding the emotional changes, transitions that may occur during recovery; such interactions include reassurance, encouragement, listening and reflection)

Theoretical underpinning: Bandura’s self-efficacy/social learning theory

Type of intervention: social support only

Components: peer support

Type of support: informational + appraisal + emotional

Support provided by: peer supporter

Setting: home

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): remote (telephone)

Time of start after event/diagnosis: 3 to 4 days after discharge

'Intensity' (no. contacts/sessions + session/contact duration): once per week for 6 weeks; duration not reported
Total programme duration: 6 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: NR

Co-interventions: none

Comparator description: usual care entailed discharge home within 5 to 8 days postoperatively. All patients received discharge teaching by a physiotherapist and/or nurse (regarding activity, medications, wound care) as well as written hospital discharge booklets that detailed what to expect in recovery and follow-up resources. Routine post-discharge appointments included the family physician (1 week), cardiologist (4 to 6 weeks) and cardiac surgeon (3 months).

Co-interventions: none

Outcomes measured: all-cause mortality, psychological well-being, social isolation and connectedness

Notes

Trial funding: Heart & Stroke Foundation of Canada, Nursing Doctoral Research Fellowship and a research grant from the Canadian Council of Cardiovascular Nurses

Declarations of interest: none described

Study characteristics

Study design: RCT (pilot, individual participant allocation)

Number of centres: single-centre

Country: Canada

Dates study conducted: August 2010 to October 2011

Maximum follow-up: 1 month

Participants

Inclusion criteria: “...HF patients had to return home after hospital discharge and live with a primary caregiver (either spouse, adult child, sibling, or significant other) who agreed to participate in the study.”

Exclusion criteria: “Exclusion criteria included inability to understand spoken and written French, cognitive problems (e.g. dementia) that would preclude provision of informed consent, and a planned regular specialized follow-up, for example, at a heart failure clinic or palliative care program, because these services would result in co-intervention bias.”

N randomised: total: 32 ; intervention: 16; comparator: 16

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 67.8 ± 9.9; comparator: 66.9 ± 11.3

Percentage male: Intervention: 69%; comparator: 56%

Ethnicity: NR

Socio-economic status (income, occupational class, education):

Education ≤ high school:
Intervention: 69%
Comparator: 56%

**Participants (supporters - if available):**

**Relationship to patient:** living with the patient

**Age (mean ± SD):** intervention: 63.2 ± 11.4; comparator: 63.7 ± 10

**Sex (% male):** intervention: 38%; comparator: 19%

**How identified/nominated/recruited:** identified as living with patient and willing to participate in the study

### Interventions

**Intervention description:**

The intervention included 5 encounters – 2 face-to-face during hospitalisation and 3 by telephone after discharge. The first face-to-face encounter was conducted with the dyad and the second with caregivers only. The first focused on the patient’s needs and the second was about the caregiver’s supportive attitudes. The second encounter involved learning how to facilitate the patient’s autonomy through role-playing.

The telephone encounters were conducted with the dyad together on speaker phone or with the patient and caregiver one at a time. The protocol allowed between 30 and 45 mins for each face-to-face encounter and 10 minutes for each phone call.

The content of the intervention was based on Deci and Ryan’s SDT. Patients and caregivers were involved as active partners and the project nurse addressed the dyad as a whole to promote patient relatedness. Based on SDT principles the project nurse interacted with the dyad by offering choice rather than imposing restrictions, avoiding criticism, encouraging empathy, and giving positive reinforcement.

Learning activities include the nurse acting as a role model for the caregivers to help them adopt supportive attitudes and behaviours in their own subsequent interactions with the patient. Role playing involving the project nurse and the caregiver were planned to provide practice in autonomy-supportive behaviours relating to patient self-care.

A patient intervention checklist and caregiver intervention checklist were developed as a guide. The patient checklist integrated the 3 basic needs proposed in the SDT: perceived competence, autonomous motivation, and perceived relatedness. The checklist includes 20 items, 11 of which refer to “assessment” (e.g. what are you doing to manage the symptoms of HF?) and 9 refer to “interventions” (e.g. providing information to the patient on potential benefits of performing self-care activities). The caregiver checklist includes 7 items describing “interventions” (e.g. exploring potential strategies with the caregiver to support HF patients without criticism).

After each encounter the project nurse checked off which assessment and nursing intervention was retained in response to the specific context of the dyad.

**Theoretical underpinning:**

The content of the intervention was based on Deci and Ryan’s Self Determination Theory

**Type of intervention:** social support only

**Components:** 2 face-to-face meetings, 3 telephone calls

**Type of support:** appraisal + emotional

**Support provided by:** intervention provided by project nurse to dyad

**Setting:** hospital and then home

**One-to-one/group:** dyad

**Face-to-face/remote (telephone/online):** 2 face-to-face meetings, 3 telephone calls

**Time of start after event/diagnosis:** NR
Cossette 2016 (Continued)

'Intensity' (no. contacts/sessions + session/contact duration): 5 'encounters' ≥ 2 x 30 to 45 minutes and 3 x 10 minutes

Total programme duration: NR

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: “The delivery of the intervention content was feasible, and each dyad received a different intervention.”

Adherence/fidelity assessed: feasibility results – 12 of the 16 dyads received all 5 planned encounters. The mean duration of the first 2 hospital encounters realised with all 16 dyads were 26 and 17 minutes respectively. Some post-discharge planned telephone encounters were not possible because the patient had been rehospitalised. The mean duration for the 1st, 2nd, and 3rd encounters was between 5 and 10 minutes. The 5th encounter was delivered to 75% of the dyads.

Co-interventions: none

Comparator description: "Control group received usual discharge planning and referrals but no intervention from the study nurse. Discharge planning in usual care is offered by the bedside nurses who provide information on HF, medication and nutrition."

Co-interventions: none

Outcomes

Outcomes measured: all-cause mortality, all-cause hospitalisation, social isolation and connectedness

Notes

Trial funding: “The team would like to acknowledge the support from the Montreal Heart Institute Foundation, the Quebec Nursing Intervention Research Network (RRIIQ), the Fonds de Recherche du Québec Santé (FRQS), the Faculty of Nursing of l’Université de Montréal (FSI of UdM) as well from the Montreal Heart Institute and its Research Center.”

Declarations of interest: none described

Dalal 2019

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 4

Country: UK

Dates study conducted: January 2015 to February 2016

Maximum follow-up: 12 months

Participants

Participants (patients)

Inclusion criteria:

• Provision of informed consent to participate
• Adults (aged ≥ 18 years)
• Patients who have a confirmed diagnosis of systolic HF on echocardiography (i.e. left ventricular ejection fraction < 45% within the past 5 years)
• Patients who have experienced no deterioration of HF symptoms in the past 2 weeks resulting in hospitalisation or alteration of HF medication

Exclusion criteria:
Patients who have undertaken CR within the past 12 months

Patients who have received an intracardiac defibrillator (ICD), cardiac resynchronisation therapy (CRT) or combined CRT/ICD device implanted in the last 6 months

Patients who have any of the following contraindications to exercise testing or exercise training documented in their medical notes:

- Early phase after acute coronary syndrome (up to 2 days)
- Untreated life-threatening cardiac arrhythmias
- Acute HF (during the initial period of haemodynamic instability)
- Uncontrolled hypertension (systolic blood pressure > 200 and/or diastolic blood pressure > 100)
- Advanced atroventricular block
- Acute myocarditis and pericarditis
- Symptomatic aortic stenosis
- Severe hypertrophic obstructive cardiomyopathy
- Acute systemic illness
- Intracardiac thrombus
- Progressive worsening of exercise tolerance or dyspnoea at rest over previous 3 to 5 days
- Significant ischaemia during low-intensity exercise (< 2 metabolic equivalents, < 50 Watts)
- Uncontrolled diabetes (blood glucose > 16 mmol/L or glycated haemoglobin > 9% or equivalent unit)
- Recent embolism
- Thrombophlebitis
- New-onset atrial fibrillation/atrial flutter

Patients who are in a long-term care establishment or who are unwilling or unable to travel to research assessments or accommodate home visits

Patients judged to be unable to participate in the study for any other reason (e.g. psychiatric disorder, diagnosis of dementia, life-threatening comorbidity)

Patients participating in concurrent interventional research which may over-burden the patient or confound data collection

N randomised: total: 216; intervention: 107; comparator: 109

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 69.7 ± 10.9; comparator: 69.9 ± 11

Percentage male: intervention: 76%; comparator: 81%

Ethnicity:

Intervention:
White (93%)
Other, Black, Asian, other (7%)

Control:
White (95%)
Other, Black, Asian, other (5%)

Socio-economic status (income, occupational class, education): NR

Participants (supporters - if available):

Relationship to patient:
Intervention:
Spouse/partner (83%)
Direct family (9%)
Other relative (2%)
Friend (6%)
Control:
Spouse/partner (82%)
Direct family (14%)
Other relative (2%)
Friend (2%)

**Age (mean ± SD):**
Intervention: 62.8 ± 14.7; control: 68.2 ± 11.3

**Sex (% male):**
Intervention 19%; control: 25%

**How identified/nominated/recruited:** "At study entry, patients were asked to nominate if they had a caregiver, i.e. a spouse, other relative or friend, who provides unpaid support to patients. Unpaid support includes emotional support, prompting with taking medications, observing for signs and symptoms of HF, getting prescriptions, encouraging participation in social events and physical activity, helping with household tasks or providing physical care."

### Interventions

**Intervention description:** The REACH-HF intervention is a comprehensive self-care support programme comprising the ‘Heart Failure Manual’ with a choice of 2 exercise programmes for patients, a ‘Family and Friends Resource’ for caregivers, a ‘Progress Tracker’ tool and a training course for facilitators.

Patients and caregivers work through the self-help manual over a 12-week period with facilitation by a specially trained intervention facilitator (cardiac nurse or physiotherapist background), who will help build the patient’s and caregiver’s understanding of how to manage HF.

The manual includes information and interactive elements covering a wide range of topics relating to living with/adapting to living with HF, and includes 4 core elements:

- An exercise training programme, tailored according to initial fitness assessments, delivered as a walking programme or chair-based exercise DVD, or a combination of the two (the patient’s choice)
- Managing stress/breathlessness/anxiety
- HF symptom monitoring (and associated help-seeking)
- Understanding and taking medications

Patients encouraged to use the progress tracker booklet, which is designed to collect the following information: changes in physical and mental state, intensity of exercise and self-reported walking speed, and degree of completion of self-monitoring sections for physical activity, enjoyable activities, frequency of self-weighing and frequency of self-reported use of stress-management techniques.

The family and friends resource, a manual for use by caregivers includes advice on providing support, becoming a caregiver, managing caregiver’s own health and well-being and getting help.

The intervention was delivered at the patient’s home via a mixture of face-to-face and telephone contacts over 12 weeks. The first contact was made by the facilitator and future contacts were agreed by the patient and facilitator at a mutually convenient time. Patient adherence was defined as attendance at the first face-to-face contact at least 2 facilitator contacts thereafter – at least one of which must have been face-to-face.

**Theoretical underpinning:**

- Motivational interviewing/self-determination theory
- Individual tailoring
- Self-regulation/control theory
- Leventhal’s common sense model
- Theories of illness adaptation
- Relapse prevention
- Cognitive behavioural therapy
• Mindfulness
• Literature on caregiver needs

**Type of intervention:** multicomponent

**Components:** exercise, HF manual, progress tracker, friends and family resource

**Type of support:** informational + instrumental + appraisal + emotional

**Support provided by:** caregiver with facilitation from trained interventionist

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** mixture of both face-to-face and telephone

**Time of start after event/diagnosis:**
- Intervention:
  - < 1: 33%
  - 1 to 2: 17%
  - > 2: 51%
- Control:
  - < 1: 32%
  - 1 to 2: 18%
  - > 2: 50%

*Intensity* (no. contacts/sessions + session/contact duration): “The mean number of facilitator contacts was 6.5 per participant, and total contact time and non-contact time inputs were 5.3 and 2.9h per participant, respectively, with overall time input at 8.25h per participant.”

**Total programme duration:** 12 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: tailoring to the exercise component

**Adherence/fidelity assessed:** “Patient adherence to the intervention was defined as attendance at the first face-to-face contact with the facilitator and at least two facilitator contacts thereafter – at least one of which must have been face to face.”

“Adherence to intervention protocols by the facilitators was ascertained through audio recordings of interviews and a fidelity checklist created as part of the intervention development”

“Of the 107 patients randomized to the REACH-HF group, 96 (90%) met our definition of intervention adherence.”

“Fidelity scores were indicative of adequate quality of REACH-HF intervention delivery, although indicating scope for improvement in several areas.”

**Co-interventions:** none described

**Comparator description:** usual care – no cardiac rehabilitation approach that included medical management according to national and local guidelines, including specialist HF nurse care

**Co-interventions:** none described

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: All-cause mortality, all-cause hospital admission, cardiovascular hospitalisation, HRQoL, psychological well-being, physical activity, adverse events.</th>
</tr>
</thead>
</table>

**Notes**

**Trial funding:** Supported by the United Kingdom’s National Institute for Health Research (NIHR) Programme Grants for Applied Research (grant number RP-PG-1210-12004). RST and NB are part-funded by the National Institute for Health Research (NIHR) Collaboration for Peninsula Leader-
ship in Applied Health Research and Care. KJ is part-funded by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) West Midlands. SSingh is supported by NIHR CLARCH East Midlands.

Declarations of interest: All authors report grants from the UK National Institute for Health Research (NIHR) during the course of the trial. There are no other declared potential conflicts of interest with respect to research, authorship, and/or publication of this article.

Deek 2017

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 3

Country: Lebanon

Dates study conducted: November 2013 - November 2014

Maximum follow-up: 12 months

Participants

Participants (patients)

Inclusion criteria: "Patients had to be adults (≥18 years) with a confirmed heart failure diagnosis validated by the Framingham Criteria, and admitted to one of the study sites for treating exacerbating symptoms of heart failure."

"Caregivers had to be literate and free of hindering conditions such as blindness or inability to understand verbal commands and engage in a meaningful conversation with the researcher who carried out this assessment before recruiting. Both the patients and their caregivers had to be willing to sign a consent form."

Exclusion criteria: "Patients living alone or in a nursing home and those in an active dying phase, awaiting cardiac surgery with limited physical functionality, or having a life expectancy of less than the follow-up period as judged by their treating physicians were excluded."

N randomised: total: 260; intervention: 128; comparator: 132

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 65 ± 14; comparator: 68 ± 14

Percentage male: intervention: 53%; comparator: 57%

Ethnicity: NR

Socio-economic status (income, occupational class, education): At least high school education: Intervention: 38 (30%) Control: 25 (19%)

Participants (supporters - if available):

Relationship to patient: the patient’s primary family caregiver

Age (mean ± SD): NR

Sex (% male): NR
### How identified/nominated/recruited:
approached during the patient’s index (first) admission and invited to participate in the study

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Intervention description: Self-care resources were provided to all participants equally. These included a digital weighing scale, medication box, calibrated bottle, and a diary packed in a branded bag with a dedicated FAMILY logo as behaviour prompt. Patients and their caregivers randomised to the intervention group also received one comprehensive family-centred educational session on self-care and symptoms management. Education was provided to the patients and their caregivers on limiting salt-intake, restricting fluid intake, using the calibrated bottle, smoking cessation, and physical activity. The identified family caregivers were educated on providing and filling the medication boxes, taking their patient’s weight daily and managing their condition. Although the sessions were standardised in terms of content and mode of delivery, these sessions were tailored to the individual patient needs based on their fluid allowance, perceived understanding, and the established need for further demonstration of the weighing and recording of weight. The educational sessions took place in the patient’s room in the hospital or wherever he or she found comfortable.</th>
</tr>
</thead>
</table>
| **Theoretical underpinning:** | **Linkage (co-ordination):** this term is mostly associated with patients with HIV where the linkage to care forms a basis of support, encouraging access to care and facilitating an understanding to the therapy and its benefits. It was also associated with decreases complications, cost and possibly transmission of the virus. In this study, patients were encouraged to follow up with their cardiologist in their clinics early after discharge and to communicate their unwelcome symptoms early with their caregivers and their healthcare providers to avoid deterioration.  
Partnership: The family member is encouraged to participate in the self-care of the patient in a lifelong condition and be treated as a community nurse with unique knowledge. In this study, family caregivers were introduced to cooking tips, how to fill medication boxes and monitor fluid intake.  
Collaboration: A collaborative care model has been tested previously to show an improved effect on the quality of care. This approach involves the family caregiver in the care by providing adequate information on symptom monitoring and management, when to take initiatives and when to contact the healthcare team.  
Information sharing: Educating patients is the main goal of most intervention studies and is the basis for adequate self-care. This, however, is a two-way concept where researchers gain insights into the patients’ lives and try to probe habits that may influence self-care.  
Behaviour change: A framework for understanding behaviour known as The COM-B system: capability, opportunity, and motivation. These concepts interrelate to influence one another and to produce change in behaviour. The educational intervention was introduced to the participants as a new strategy to improve outcomes through empowering their caregiver and enhancing their will to avoid complications of their condition.  
Support: Self-care usually refers to the individual but that it is mostly accomplished with the help and support from others. In a collectivist culture, support is usually gained from family members living in the same household as the patient. As observed, in Lebanon the wife is usually the source of support for the husband and the daughter for her mother.  
Empowerment: Also known as autonomy support and defined as the practice where patients are encouraged to make their own decisions based on the provided health choices and their consequences to manage behaviour change. This includes the decision to take an extra urine pill or reduce fluid intake to manage their fluid overload as evaluated by their weight change.  
Family unit: Family is identified as the basis of self awareness where people’s actions, beliefs and roles are influenced by the fact that they are part of a group. These come into consideration when one’s health is affected and it is the role of the healthcare providers to strengthen the ties of the family and provide support.  
Self-regulation: Is a process where a person decides to adopt new health practices and is guided by the primary motivator to change behaviour. One might be led by the perceived risk of specific behaviour; defensive optimism or the desired goal; functional optimism. The latter being a pre-requisite for behaviour change. |
**Deek 2017 (Continued)**

**Type of intervention:** multicomponent

**Components:** education plus provision of self-care resources (weighing scales, medication box, calibrated bottle, diary)

**Type of support:** informational + instrumental

**Support provided by:** education session provided by nurse with rich experience in cardiovascular nursing to patient and their caregiver

**Setting:** centre-based

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** pre-discharge

'Intensity' (no. contacts/sessions + session/contact duration): 1 session, 30 to 45 minutes

**Total programme duration:** 1 session

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: “Although the sessions were standardised in terms of content and mode of delivery, which was detailed explanation of the self-care activities, these sessions were tailored to the individual patient needs based on their fluid allowance, perceived understanding and the established need for further demonstration of the weighing and recording of weight.”

**Adherence/fidelity assessed:** not assessed

**Co-interventions:** none described

**Comparator description:** provision of the same self-care resources received by the intervention group, without the single education session

**Co-interventions:** none described

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: all-cause hospitalisation, MI, HRQoL</th>
</tr>
</thead>
</table>

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<tr>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trial funding:</strong> supported by the Sigma Theta Tau International Honour Society for Nurses</td>
</tr>
<tr>
<td><strong>Declarations of interest:</strong> none described</td>
</tr>
</tbody>
</table>

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**Deka 2019**

**Study characteristics**

**Methods**

**Study design:** RCT (pilot, individual participant allocation)

**Number of centres:** 2

**Country:** USA

**Dates study conducted:** NR

**Maximum follow-up:** 8 weeks

<table>
<thead>
<tr>
<th>Participants</th>
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<tr>
<td><strong>Participants (patients)</strong></td>
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</table>

**Inclusion criteria:** diagnosis of NYHA class I-III HF with no change in clinical history in the past 30 days and receiving standard pharmacological treatment with a stabilised dose of beta-blockers to
elicit stable heart rate response, access to electronic devices (desktop/laptop/ipad/tablet/smartphone) with Internet connectivity and cardiologist clearance to exercise

**Exclusion criteria:** restricted from participating in aerobic exercise (orthopaedic or neuromuscular disorders and clinical evidence of decompensated HF) or were involved in any formal exercise (3 times a week for 30 minutes or more) in the past 30 days

**N randomised:** total: 30; intervention: 15; comparator: 15

**Diagnosis (% of participants):** HF: 100%

**Age (mean ± SD):** intervention: 61.7 ± 11.3; comparator: 67.8 ± 11.4

**Percentage male:** intervention: 67%; comparator: 60%

**Ethnicity:** 100% Caucasian

**Socio-economic status (income, occupational class, education):** NR

**Participants (supporters - if available):**

**Relationship to patient:** fellow intervention group members

**Age (mean ± SD):** NR

**Sex (% male):** NR

**How identified/nominated/recruited:** NR

**Interventions**  
**Intervention description:** MOVE-HF intervention (8 weeks)

Exercise routine: consisted of a community walking programme to meet the recommended guidelines of 150 minutes/week moderate intensity aerobic exercise. RPE 10 to 14 used to guide moderate intensity. Participants asked to monitor HR during exercise and asked not to exercise at an intensity that caused the HR to exceed the average HR from their 6-MWT.

Fitbit Charge HR (FCHR): FCHR and Fitbit software installed in participants' electronic devices used to provide objective feedback on daily physical activity. FCHR tracks, records and delivers information on step count, HR and active minutes in real time. Participants asked to record all exercise sessions manually and sync the FCHR to the Fitbit software to validate self-reported data.

Exercise diaries: all participants provided paper exercise diaries. For 8 weeks on a daily basis they were asked to record: exercise sessions (with date, duration, and RPE), barriers faced, strategies used to overcome these barriers, and their intention to adhere to the recommended exercise guidelines on a scale of 1 to 5 at the beginning of the week.

Education on HF self-care: a web-link along with a handout on eight modules of HF self-care from the Heart Failure Society of America were provided. Modules included: understanding HF, exercise and activity with HF, how to follow a low sodium diet, HF medication, dealing with HF symptoms, depression and anxiety with HF, managing lifestyle changes along with other chronic conditions and heart rhythm problems.

Social support through Vidyo (provided only to the experimental group): the 15 participants were further divided into 3 cohort groups with 5 members each. For 8 weeks each cohort met weekly for a 45- to 60-minute long Internet-based synchronised face-to-face video (IBSF2FV) education/discussion session using Vidyo. Each week, education was provided on one topic of self-care from the handout provided to participants. Participants were encouraged to interact with other group members. These social interactions, targeted towards exercise performance and achieving adherence to the recommended guidelines, were intended to influence self-efficacy for exercise in the group members. The primary investigator (PI), who moderated these education/discussion sessions, provided encouragement to follow the exercise routine and suggestions on overcoming exercise barriers.
Theoretical underpinning: Bandura’s social cognitive theory (SCT) and Ajzen's theory of planned behaviour (TPB)

Type of intervention: multicomponent

Components: exercise, education, provision of Fitbit, exercise diaries, social support

Type of support: informational + instrumental + appraisal

Support provided by: fellow intervention group participants

Setting: community (walking programme)

One-to-one/group: group

Face-to-face/remote (telephone/online): remote (online video conference software)

Time of start after event/diagnosis: NR

’Intensity’ (no. contacts/sessions + session/contact duration): 8 weekly meetings, 45 to 60 minutes each

Total programme duration: 8 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: attendance to Vidyo group meetings – overall attendance was 68%, with 73.3% attending 5 or more of the 8 possible sessions

Co-interventions: none

Comparator description: comparator received the same intervention, with all components apart from the weekly Vidyo social support sessions

Co-interventions: none

Outcomes measured: physical activity, social isolation and connectedness

Notes

Trial funding: Midwest Nursing Research Society/Center for the Advancement for Nursing Sciences (MNRS/CANS) dissertation grant for 2016. No funding was received from Fitbit for the project

Declarations of interest: none described

Study design: RCT (individual participant allocation, wait-list control)

Number of centres: 3

Country: USA

Dates study conducted: NR

Maximum follow-up: 3 months

Inclusion criteria: (1) diagnosis of chronic HF for at least 3 months, (2) able to read and speak English or Spanish, (3) older than 55 years, and (4) living in a setting where they are able to engage in self-care (e.g. not in a long-term care setting)
Exclusion criteria: (1) inability or unwillingness to provide informed consent or (2) cognitive impairment as screened by administration of the clock drawing test that is significant enough to interfere with participation in the intervention or completion of the study instruments.

N randomised: total: 75; intervention: 38; comparator: 37

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): Intervention: 72 ± 10.4; comparator: 67 ± 9.4

Percentage male: Intervention: 42%; comparator: 52%

Ethnicity:
- Intervention:
  - Black (24%)
  - Hispanic (32%)
  - White (32%)
  - Other (12%)
- Control:
  - Black (30%)
  - Hispanic (32%)
  - White (22%)
  - Other (16%)

Socio-economic status (income, occupational class, education):
- Financial status:
  - Intervention:
    - Comfortable, more than enough (21%)
    - Enough to make ends meet (37%)
    - Not enough to make ends meet (42%)
  - Control:
    - Comfortable, more than enough (16%)
    - Enough to make ends meet (37%)
    - Not enough to make ends meet (47%)

Participants (supporters - if available):
- Relationship to patient: “Family members and significant others are encouraged to attend the intervention sessions as well.”

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: NR

Interventions

Intervention description: The skill-building self-care intervention begins with an assessment of current knowledge of HF, tactical skill, and unique circumstances that need to be considered in teaching these skills (e.g. food preferences, family roles). Skill-building exercises focus on skill deficits and managing unique situations through practice and role-playing exercises. Assessment of the social supports and specific resources needed for adequate self-care are identified. The situational skills address the need for understanding the link between the individual’s unique symptoms, the underlying HF mechanism, the cause of symptoms, and specific actions needed to avert an HF exacerbation.

The intervention was designed to be delivered in a group setting by a specially trained health educator. It was anticipated that 6 to 8 60-minute sessions scheduled over 1 month would be adequate to deliver the intervention in a community setting. Twice-weekly sessions were offered that covered 4 major content areas: (1) low-salt diet, (2) medication adherence, (3) symptom monitoring, (4) symptom management.
Each session begins with a review of the key messages from the previous session, a discussion of participant progress towards goals set in the previous session, and the linkage to the current session content. This allowed individuals to ask questions, clarify or receive additional information if sessions were missed. Some content (e.g. comorbidities) varies depending on the composite of the group. Individuals are encouraged to attend at least 5 sessions but are able to attend as many as they like. Family members and significant others are encouraged to attend the intervention sessions as well.

A manual with tasks to be done at home is provided to all participants.

**Theoretical underpinning:** “Self-care is best understood as a naturalistic decision-making process in which persons engage for the purpose of maintaining health and managing their illness. This framework explains that, in real-world settings, people make decisions that are meaningful and familiar to them. Real-life decisions are influenced by the interaction between the individual, the problem, and the environment. Self-care decisions, for example, on whether to take medication or act early on symptoms, are situation and context specific, influenced by knowledge about and experience with decision making in the particular context, skill to act on the decision made, and the compatibility of the decision and action with values. Values are shaped by sociocultural influences. On the basis of the naturalistic decision-making process, an intervention to improve self-care must build skill in all aspects of self-care, including unique situations; be consistent with values; and improve knowledge about HF and HF self-care. An intervention delivered in a community group setting has the potential to address these requisites by providing a venue and social support for practical skill development and learning as well as a forum to discuss values that are shaped by social norms and cultural beliefs.”

**Type of intervention:** social support only

**Components:** group education sessions

**Type of support:** informational + appraisal

**Support provided by:** health educator – with a minimum of a bachelor’s degree in a health-related field and formal training in health education served as interventionists. They received 3-day training to provide context for interactions with the disease population and ensure consistency in delivery of the intervention.

**Setting:** community

**One-to-one/group:** group (4 to 8 participants)

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** NR

‘Intensity’ (no. contacts/sessions + session/contact duration): 6 to 8 x 60-minute sessions

**Total programme duration:** 1 month

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** some adaptation to sessions based on the group (e.g. group not taught about diabetes as a comorbidity if no one has it)

**Adherence/fidelity assessed:** 91% participants attended all sessions (mean (SD) sessions attended 5.7 (0.5)). Common barriers for those unable to attend included inclement weather and transportation issues.

Fidelity – to date 91% adherence to the intervention protocol

**Co-interventions:** none described

**Comparator description:** wait-list control – waited until 3-month data collection completed to start the intervention

**Co-interventions:** none described
Dickson 2015 (Continued)

Outcomes

**Outcomes measured:** HRQoL

Notes

**Trial funding:** supported by the American Heart Association Clinical Research Program Grant Founders’ Affiliate 10CRP4140049

**Declarations of interest:** none described

Dunbar 2005

**Study characteristics**

**Methods**

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** 3
- **Country:** USA
- **Dates study conducted:** NR
- **Maximum follow-up:** 3 months

**Participants**

**Participants (patients)**

**Inclusion criteria:** (a) diagnosis of persistent HF, ICD-9CM codes 428 inclusive, (b) availability of a participating family member (FM), (c) ability to read, write, and speak English, (d) on medication regimens that included ACE inhibitors and diuretics, and (e) no contraindication to the proposed 2 g sodium diet

**Exclusion criteria:** (a) acute myocardial infarction during the previous 6 months, (b) valvular heart disease, (c) significant angina pectoris, (d) renal failure, (e) HF secondary to a medical condition (e.g. hyperthyroidism), (f) planned cardiac surgery, (g) currently receiving care from a psychiatrist or home health care, or (h) lack of a telephone for follow-up

**N randomised:** total: 61; intervention: 32; comparator: 29

**Diagnosis (% of participants):** HF: 100%

**Age (mean ± SD):** intervention: 58.4 ± 12 ; comparator: 63 ± 11

**Percentage male:** intervention: 48.3%; comparator: 59.3%

**Ethnicity:**

- Family education (EDUC; control) group: White: 20 (69%) Black: 9 (31%)
- Family education + family partnership intervention (EDUC + FPI; intervention) group: White: 17 (53.1%) Black: 15 (46.9%)

**Socio-economic status (income, occupational class, education):**

- EDUC (control) group:
  - Less than high school: 4 (13.7%)
  - High school or greater: 25 (86.2%)

- EDUC+FPI (intervention) group:
  - Less than high school: 4 (12.5%)
  - High school or greater: 28 (87.5%)

**Participants (supporters - if available):**
**Relationship to patient:**

EDUC (control) group:
- Spouses: 62.5%
- Adult child: 25%
- Other: 12.5%

EDUC + FPI (intervention) group:
- Spouses: 71.9%
- Adult child: 18.8%
- Other: 9.3%

**Age (mean ± SD):** 54 ± 17

**Sex (% male):** 23%

**How identified/nominated/recruited:** Family members (FM) were defined as spouse or adult FM living in the same household and/or considered to be the primary caregiver willing to participate.

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**Interventions**

**Intervention description:**

Educational intervention:

“Those assigned to the family education intervention received in-depth education and counselling by a nurse expert and a dietician in the General Clinical Research Center of one of the tertiary care facilities. Sessions lasted approximately 1-1.5 hours and included content on general HF information and care, food preparation techniques, shopping and food selection, label reading, restaurant dining, and low-sodium food alternatives. Educational strategies included didactic and written information (A Stronger Pump, Prichett and Hull, Associates), a video on HF care, and individualised dietary discussion and feedback to promote knowledge as well as self-efficacy in selecting and preparing low-sodium foods. Graph and report of Urine NA obtained from a 24-hr specimen depicted how well the participants were meeting their dietary sodium goal (2 g/day). A discussion of the report and suggestions for improving low-sodium dietary choices occurred in a follow up telephone call.”

Family partnership intervention:

Dyads randomised to the EDUC + FPI received the same education, counselling, and feedback by the same research nurse and dietician as described above plus 2 additional sessions focussing on enhancing family support and patient choice through communication and empathy.

The 2 FPI sessions occurred within 3 to 5 weeks after baseline and lasted around 2 hours each. The family partnership intervention was based on autonomy support theory and focused on helping FMs develop communication techniques to provide choice and encourage the HF patient to accept responsibility, provide supportive and empathetic messages, and give non-evaluative feedback.

These approaches were developed to reduce negative criticism in his or her interactions with the person having HF, increase family problem-solving, and promote the patient’s confidence in self-management behaviours. Strategies included didactic and written material, case scenarios, and group discussion. Case scenarios were developed around the behaviours of patients with HF and choices in dietary self-management and included typical situations described by FMs as difficult.

Group discussion and role-playing focused on ideal responses by FMs to create an autonomy-supportive environment. Autonomy-supportive responses and proactive behaviors by the FM were emphasised as skills over the natural tendency towards critical responses. Separate sessions with the patient with HF were conducted simultaneously, and these focused on identifying ways to involve FMs in their diet regimen and reinforcement of their efforts to increase self-initiation of their sodium management. At the end of the second session, patients with HF and FMs regrouped for a debriefing and discussion of the family partnership approach.

One month after the intervention, dyads were mailed a newsletter, which included information on HF self-care and low-sodium recipes appropriate for the season of the year, and the FPI group received additional content to reinforce the autonomy-supportive communication techniques.

**Theoretical underpinning:** autonomy support theory
Type of intervention: multicomponent

Components: education and social support

Type of support: informational + instrumental + appraisal + emotional

Support provided by: family member, involved as part of the intervention

Setting: not clear

One-to-one/group: group (3 to 4 people)

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: 3 to 5 weeks after baseline measures

'Intensity' (no. contacts/sessions + session/contact duration): EDUC = 1 to 1.5 hours

FPI = 2 sessions, 2 hours

Total programme duration: 2 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: objective criteria of adherence (< 2500 mg urine NA)

Co-interventions: none described

Comparator description: control group received the educational intervention only, without the FPI sessions

Co-interventions: none described

Outcomes measured: no outcomes of interest

Notes:

Trial funding: supported in part by Grant in Aid 9905220N from the American Heart Association and by PHS Grant M01-RR00039 from the Emory General Clinical Research Center, National Institutes of Health, National Center for Health Resources. Acknowledgements to Prichett & Hull, Inc, for their contribution of A Stronger Pump books

Declarations of interest: NR

Study characteristics

Study design: RCT (individual participant allocation, 3-arm)

Number of centres: 3

Country: USA

Dates study conducted: March 2005 to July 2008

Maximum follow-up: 8 months

Inclusion criteria: diagnosis of HF confirmed in the medical record, age 30 to 79 years, NYHA functional class II-III, English fluency, telephone access, on optimal HF medication regimen unless documented contraindication, including angiotension-converting enzyme inhibitors, or angiotension II receptor blockers, beta-adrenergic blocking agent, and diuretics, eligible for a low-Na diet, am-
Interventions

Intervention description:

The FPI group initially received the same protocol for dyadic teaching and individualised feedback on dietary Na and medications as described above.

In addition, they attended two 2-hour small group FPI sessions led by a trained master’s-prepared research nurse who began the session with a brief discussion of reinforcing dietary and medication education with patient and family members together. Then breakout patient and family member education and training sessions were held.

The content and discussions included: 1) perceptions of living with HF or a family member with HF; 2) principles of autonomy supportive communication; and 3) HF self-care scenarios with role-playing of responses based on autonomy supportive approaches which have been previously validated.

For the maintenance phase, dyads received a scripted booster telephone call, during which information about the patient’s 4-month dietary Na results were reviewed with reinforcement of efforts to reduce dietary Na and take medications. In addition, the research nurse used a script tailored to the dyad’s baseline and 4-month autonomy support and family criticism scores to reinforce strategies for working together through autonomy-supportive communication. The FPI group
was mailed study newsletters with information similar to that sent to the PFE group, with the addition of tips for implementing an autonomy-supportive family partnership.

Patient-Family education (PFE):

After baseline data collection, dyads participated in an educational session (~1 hour) delivered by a trained master’s prepared research nurse. Content included general HF overview, symptoms of fluid overload, rationale for and ways to modify dietary Na intake, cues to take medications regularly and maintain refills, and other self-management activities such as weighing daily and physical activity. Time was allowed for individual questions.

By 2 months, dyads attended a 2nd group session (2 hours) focused on reinforcing education about dietary Na and medication taking behaviours. This group was conducted by a trained master’s-prepared nurse and registered dietitian. This session included active learning activities, such as selection of low-Na foods, meal planning, and adapting recipes. Co-ordinated written and media resources were provided, including materials developed for the study, brochures (“Taking Control of Your Heart Failure”, “How to Follow a Low Sodium Diet”, and “Heart Failure Medicines”; HFSA), and a DVD (“Heart Failure Basics to Better Care”; Milner-Fenwick).

Participants also received individual feedback in the form of a written report regarding their dietary Na intake and medication adherence. The feedback included their dietary Na intake derived from analysis of a 3-day food record (3DFR) that listed the participant’s specific high- and low-Na foods and the results of their baseline 24-hour urinary Na compared with the goal of 2000 mg/day. Medication adherence data obtained from the medication event monitoring system (MEMS; % of prescribed doses taken correctly) also were included in the report. This information was presented in text and graph formats, and at each of the study time points the report was updated with dietary Na intake, high-Na foods and alternatives, 24-hour urinary Na results, and MA so that participants could track their progress.

Theoretical underpinning: self-determination theory; autonomy support theory.

“The study was based on the model of heart failure self-care, which depicts the influence of individual patient antecedents (including demographic, clinical, behavioral factors), on self-care management and outcomes in heart failure within the influence of a family context”

Type of intervention: multicomponent

Components: education and social support

Type of support: informational + instrumental + appraisal + emotional

Support provided by: family member as part of the intervention

Setting: NR

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face with follow-up telephone call

Time of start after event/diagnosis: 1 to 2 months after baseline measures obtained

‘Intensity’ (no. contacts/sessions + session/contact duration): 1 x 1-hour education session, plus 2 x 2-hour family partnership sessions, plus 1 x telephone booster session (no time reported)

Total programme duration: 4 to 5 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:

“Both the autonomy support and the perceived family criticism (PFC) scores were used for providing tailored information and counseling to the FPI dyads during intervention components”

Adherence/fidelity assessed: “Fidelity of the intervention was monitored by random investigator attendance at group sessions and review of interventionist completed check sheets for coverage of specific content and activities at each session. Interventionists were retrained periodically.”
“Overall participant adherence to the intervention, defined as the percentage of dyads who received >50% of the intervention, was 81.8% for PFE and 87.9% for FPI.”

Co-interventions: none described

Comparator description: usual care group:

Participants in the UC group received an informational brochure, “Taking Control of Your Heart Failure” (Heart Failure Society of America [HFSA]) and usual care from their health care providers.

To maintain interest in the project, a study newsletter was mailed once to the UC group at 4 to 5 months and contained an update on the number of study participants and reminder of remaining study activities.

Co-interventions: none described

### Outcomes

| Outcomes measured: all-cause mortality, social isolation and connectedness |

### Notes

**Trial funding:** A Family Partnership Intervention for Heart Failure’’ (R01 R08800), National Institute of Nursing Research, National Institutes of Health (NIH), July 1, 2004November 30, 2009; Public Health Service (PHS) grants M01 RR0039 from the General Clinical Research Center program and UL1 RR025008 from the Clinical and Translational Science Award program, National Center for Research Resources, NIH; and Nitromed

**Declarations of interest:** none described

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### Study characteristics

**Methods**

- **Study design:** RCT (pilot, individual participant allocation, 3 arms)
- **Number of centres:** 1 (3 care units from a large teaching hospital)
- **Country:** USA
- **Dates study conducted:** April 2016 to December 2016
- **Maximum follow-up:** 8 weeks

**Participants**

**Inclusion criteria:** mild to severe state hopelessness, 18 years of age or older, diagnosed with IHD, including MI or unstable angina, or having undergone PCI, stent or CABG, able to use a cell phone and receive text messages, able to follow a PA programme in a home or cardiac rehabilitation setting, having a planned discharge at home, ability to speak and read in English, having the cognitive and physical ability to complete the screening instrument

Mild to severe state hopelessness was defined in this pilot as ≥ 1.8, based on cut-points (1.8 to 2.0 = mild hopelessness and > 2.0 = moderate to severe hopelessness)

**Exclusion criteria:** none

- **N randomised:** total: 24; intervention 1: 9; intervention 2: 8; comparator: 7
- **Diagnosis (% of participants):** mixed population, no % provided
- **Age (mean ± SD):** intervention 1: 58.4 ± 14.3 ; intervention 2: 55.4 ± 15.6; comparator: 63.7 ± 9.9
- **Percentage male:** intervention 1: 77.8%; intervention 2: 62.5%; comparator: 71.4%
Ethnicity:
Non-white: 3 (12.5%)
White: 21 (87.5%)

Socio-economic status (income, occupational class, education):
No college: 10 (41.7%)
Some college: 14 (58.3%)

Participants (supporters - if available):
Relationship to patient: in the motivational social support (MSS) only group, support messages received from the nurse
In the MSS from a nurse with social support from a significant other (MSS and SOS) group, support messages received support messages from both the nurse and from their self-identified significant other

Age (mean ± SD): NR
Sex (% male): NR

How identified/nominated/recruited: self-identified

Interventions

Intervention description: the Heart Up! Intervention, based on SDT includes motivational interviewing and text messaging components

Motivational interviewing component:
Both MSS and MSS with SOS groups participated in a 1-hour session with a motivational interviewer (nurse) in the patient’s home (week 1). The nurse used motivational interview techniques to explore the patient’s thoughts about making a behaviour change to attain adequate PA based on instructions provided by hospital staff. Motivational interviewing sessions were tailored with emphasis on the benefits of PA and the patient’s confidence level in achieving PA. Patients completed 2 tools as part of the motivational interviewing: (1) an Importance of PA Ruler, and (2) a Confidence with PA rules (each measured on a Likert-type scale).

Text messaging component:
Upon completion of the motivational interviewing, patients in both MSS and MSS with SOS groups received daily social support text messages (developed by the researchers) from the nurse 5 days per week for 6 weeks. Patients in the MSS with SOS group also received social support text messages (developed by the researchers) from their self-identified significant other during the same time period.

The nurse texts were sent via an automated system. The nurse provided a hard copy of text messages to the patient’s significant other. The order of texts sent by the nurse and significant other were randomised so that they were unique to each patient.

During week 1 the nurse confirmed by phone with the patient that text messages had been received from the nurse and significant other. Patients and significant others kept logs to track the number of messages received, read or sent.

Theoretical underpinning: Self-Determination Theory (SDT)

Type of intervention: multicomponent

Components: motivational interviewing and text messages

Type of support: emotional

Support provided by: nurses:

Two nurses were randomly assigned to patients to deliver the motivational interviewing. The nurses completed online and in-person training from an experienced motivational interviewer and used a script for all sessions.
Significant others:
Self-identified by the patient. Provided a hard copy of the text messages to send.

Setting: home

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): face-to-face motivational interview, and remote social support text messages

Time of start after event/diagnosis: 1 week after hospital discharge

'Intensity' (no. contacts/sessions + session/contact duration): 1 face-to-face contact session – 1 hour

MSS only group – 5 text messages per week for 6 weeks from nurse

MSS with SOS group – 5 text messages per week for 6 weeks from nurse

Plus 5 text messages per week for 6 weeks from significant other

Total programme duration: 6 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:
motivational interviewing sessions were tailored with emphasis on the benefits of PA and the patient’s confidence level in achieving PA

Adherence/fidelity assessed: Fidelity:

Audio fidelity to the protocol was confirmed by the review of randomly selected recordings from 25% of the sessions. Audio reviews included the transcription and coding of the content by a trained research assistant, with each review being repeated by the principal investigator to confirm accuracy.

Co-interventions: none described

Comparator description: 6 weeks of usual care

Co-interventions: none described

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<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: all-cause mortality, physical activity</th>
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Notes

Trial funding: Susan Dunn received funding for this work through the Michigan State University Trifecta Initiative and the Sparrow Health System/Michigan State University Centre for Innovation and Research

Declarations of interest: none described

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 1

Country: Iran

Dates study conducted: February 2017 to March 2018

Maximum follow-up: 30 days
Participants (patients)

Inclusion criteria: patients with first-time myocardial infarction (diagnosed by a cardiologist) aged between 30 and 60 years. No record of psychological disorders (diagnosed by a physician).

Exclusion criteria: patient’s non-participation in 2 educational sessions for any reason and the patient’s death during the study.

N randomised: total: 70; intervention: 35; comparator: 35

Diagnosis (% of participants): MI: 100%

Age (mean ± SD): intervention: 55.66 ± 10.25; comparator: 54.38 ± 12.47

Percentage male: intervention: 71.42%; comparator: 60%

Ethnicity:
- Intervention group:
  - Fars n = 30 (85.71%)
  - Turkman n = 3 (8.57%)
  - Other n = 2 (5.71%)
- Control group:
  - Fars n = 30 (94.28%)
  - Turkman n = 3 (2.85%)
  - Other n = 2 (2.85%)

Socio-economic status (income, occupational class, education): NR

Participants (supporters - if available):

Relationship to patient: peer supporter

Age (mean ± SD): NR

Sex (% male): 50%

How identified/nominated/recruited: Patients with a history of myocardial infarction in the past 3 years were assessed and 7 of them were invited to collaborate. Eventually, 2 patients with a history of myocardial infarction (one man and one woman) capable of doing this training were selected as peers. Inclusion criteria for selecting the peers included their volunteering to participate in the study, having a graduate diploma or a higher degree, making a full recovery (at least 1 year after the stroke), and having a high quality of life (based on McNew’s questionnaire).

Interventions

Intervention description: in the intervention group, along with receiving routine training on the third day after myocardial infarction, the peers trained patients in 2 one-hour training sessions (at intervals of 1 hour) according to the researcher’s supervision (based on the patient tolerance or readiness, the distance between these 2 sessions would be increased). McNew’s quality of life questionnaire in both groups was completed on the third day of hospitalisation, and 4 weeks later.

Theoretical underpinning: NR

Type of intervention: social support only

Components: “The peers trained patients in 2 one-hour training sessions (at intervals of one hour) according to the researcher’s supervision (based on the patient tolerance or readiness, the distance between these two sessions would be increased).”

Type of support: informational

Support provided by: Peer educators. The peers were trained by the researcher during 3 training sessions. Educational materials were determined according to the research objectives. The concepts and benefits of the peer education, the educational needs of the patients with myocardial infarction (i.e. definition of myocardial infarction, mechanism and cause of the symptoms, risk fac-
tors, general principles of the treatment, drug therapy, non-pharmacological management, physical activity, marital relationship, weight control, diet regimen, follow-up care, management of dyspnoea, fatigue, and chest pain) were trained.

**Setting:** centre

**One-to-one/group:** unclear

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 3 days post admission to hospital for MI

**'Intensity' (no. contacts/sessions + session/contact duration):** 2 x 1-hour education sessions (with 1-hour interval)

**Total programme duration:** 2 hours

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none described

**Comparator description:** routine care on day 3 post-admission for MI

**Co-interventions:** none described

### Outcomes

**Outcomes measured:** HRQoL

### Notes

**Trial funding:** the research council of Shahroud University of Medical Sciences (Grant No: 9750)

**Declarations of interest:** none described
Ethnicity: NR

Socio-economic status (income, occupational class, education):

Intervention: primary 54%; secondary 41%; college 4%
Comparator: primary 54%, secondary 39%, college 7%

Participants (supporters - if available):

Relationship to patient: family member

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: family member who patient lives with

Interventions

**Intervention description:**

"Research Group' on the basis of the control group to carry out patient and family members A well-suited management model.

Family-patient paired intervention: nurses treat illness. People and their immediate family members form an intervention group, requesting family members to people live together. The nurse is looking for a quiet and comfortable place for both parties.

Places for missions and education are generally placed in the activity room. Before the mission begins, the nurse distributes a pen and a notepad to each side and tells them in advance. Patients and their family members should listen carefully in class and recognize themselves in this class. Record important knowledge points and ask both parties to repeat the lesson after class the knowledge points mastered in the class. After the mission started, the nurses used the multimedia design prepare to introduce the occurrence, development, prognosis and outcome of the disease to patients and their families and inform the basic procedure of the operation and the corresponding principles, and at the same time instruct patients and their families on basic self-care points after surgery. The nurse is proclaiming during the teaching process, pay attention to the eye contact with the patient and family members, from their eyes understand the patient and family members' understanding of the corresponding knowledge points. Once found

When there is a confused look in his eyes, the nurse slows down his speech and uses hand-painted the form of animation introduces the corresponding knowledge points to it. Nurse mission time control the system is in 20min. After the mission is over, the notepad for patients and their families check it out and ask both parties to tell each other that they are in this class one party listens quietly to the knowledge points mastered in, and gives timely feedback point out its cognitive biases and related internal Rong, the nurse used her mobile phone to record the conversation between the two parties, each person's retelling time is controlled at 10 minutes. After the missions of both parties are over, the nurses make overall assessments based on their respective notebooks and retelling content. Price, point out the points that both sides are worthy of affirmation. After this mission is over, the nurse will record the video data and related paper materials to pack, and ask patients and family members to go back to conduct a review, and each person spends 30 min to supervise and warm each other's time. The next day, the nurse asked the patient and family members to repeat themselves to each other the relevant knowledge mastered yesterday, each person's time is controlled at 10 min, ask one party to repeat it while the other listened quietly and pointed out of its shortcomings.

Situational health scene education: nurses extract relevant information closely related to the patient's daily life in the content of missions and education information, and based on his own years of clinical experience, draw up corresponding scenarios, for example: "Now you have been discharged from the hospital, after getting up one morning, you suddenly feel a faint pain in my chest. At first you didn’t agree with it, but the degree of pain increases as time goes by, it gradually worsens and worsens. What measures will you and your family take how to deal with it? Please take 5min for both of you to think about it, test and propose corresponding solutions. Ok you guys start thinking now right." After the patient and family members have thought about it, ask them to Jing
proposed specific intervention measures, including: You suspect that you are appearing What kind of situation? When faced with such a sudden situation, what would you adopt How to deal with it? What do you think is the feasibility of this kind of plan? When the patient and family members are answering questions, the nurse uses the mobile phone record the content of the two parties’ talks, and aim at their audio-based ideas and content, The nurse pointed out their own shortcomings and affirmed their desirable place. After the three parties have communicated their opinions, ask the patient and family members to use words to record the following mentality, Handling measures and self-reflection, each side will give 20 minutes to each. Record the content and ask them to think as much as possible about the heart brought by the situation Inspiration touch, thereby strengthening the inner coping ability.

WeChat guided form Effective record: Nurses pull themselves, patients and their families into the WeChat group, Requiring family members to supervise the completion of the patient’s daily health People carefully review their photos that day 30 minutes before going to bed every night Responses are recorded one by one in the form of a running account and compiled in the WeChat group After the corresponding information is compiled, it will be pushed and distributed. And the family members treat the patient’s Comment on the behaviour, point out what is feasible and what it ignores, and ask the patient to make persistent efforts the next day, so as to improve the patient’s effective self-management motivation. In addition, the nurse asked the patient to give the best status, presented in the circle of friends in the form of pictures and texts, and let them be equipped with one photo and the corresponding text description will show your best mental outlook. When presented, the text is mainly equipped with perceptual text rich in positive energy. In addition, the family members also took the patient’s best behavior for the first day in the form of pictures and texts. In the description text, as much as possible to reflect one’s own the patient’s care and emotional encouragement have continuously helped them to build and overcome.”

Theoretical underpinning: NR

Type of intervention: multicomponent

Components: education, scenario based problem-solving, Wechat

Type of support: informational + instrumental + appraisal + emotional

Support provided by: family member

Setting: secondary care

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face and remote (WeChat)

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): unclear

Total programme duration: unclear

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: no

Adherence/fidelity assessed: no

Co-interventions: none

Comparator description: usual care. The "control group" implements traditional nursing care strategies. Responsibility - the doctor introduces the basic self-care content of coronary heart disease to the patient, and guides the patient. Psychological counselling, guide patients to adjust dietary structure, encourage them to carry out appropriate physical exercise and basic life care for them.

Co-interventions: none

Outcomes measured: no outcomes of interest
Gao 2017 (Continued)

Notes

Translated

Trial funding: NR

Declarations of interest: NR

Gortner 1988

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 3

Country: USA

Dates study conducted: August 1984 to January 1986

Maximum follow-up: 6 months

Participants

Participants (patients)

Inclusion criteria: all English-speaking patients entering the 3 study hospitals for first time CABG and/or valve replacement surgery, between the ages of 30 and 75 were considered eligible if they were married to a consenting spouse

Exclusion criteria: other major medical conditions

N randomised: total: 79; intervention: 38; comparator: 41

Diagnosis (N participants):

CABG: control: 24; intervention: 25

Post-valve replacement/repair: control: 6; intervention: 6

Combination (valve repair and CABG): control: 5; intervention: 1

Age range (N participants):

Intervention:
30 to 50: 6
51 to 69: 22
70 to 77: 4

Comparator:
30 to 50: 2
51 to 69: 26
70 to 77: 7

Percentage male: intervention: 81.3%; comparator: 80%

Ethnicity: 88% Caucasian

Socio-economic status (income, occupational class, education):
Managerial and professional occupations: 54%
Retired: 12%
Homemakers: 13%

Participants (supporters - if available):

Relationship to patient: spouses
Interventions

**Intervention description:** Intervention 1 was employed in an attempt to standardise knowledge about cardiac risk factor reduction and recovery between groups. It consisted of a standard slide/tape teaching programme developed by the American Heart Association and was shown to both experimental and control participants to encourage exercise, diet adherence and surgical recovery. Intervention II was the experimental slide/tape teaching programme and counselling session designed to provide families with anticipatory guidance on recovery at home and common emotional responses in the immediate post-discharge period. The slide/tape programme was formatted after the American Heart Association films and took 8 minutes to view. The counselling session was held with patient and spouse immediately after viewing the film.

Intervention III was intended to reinforce interventions I and II and to monitor patients and spouses to detect early signs of physical or emotional difficulties with recovery. In addition, it was hypothesised that intervention III would affect the reported level of self-efficacy over time. Telephone calls were carried out by masters- or doctorally-prepared nurses who followed as structured protocol for data collection and who individualised calling to the needs of family members as necessary (i.e. teach, coach, refer). The previous week's efforts at problem resolution were reviewed on the next telephone call, and notes made on the semi-structured questionnaire developed for use with intervention III. For the 32 cases carried to the 6-month time, continuity was maintained by having the same interviewer call throughout the period, except when emergencies or illnesses prevented this. Ideally the person that carried out the intervention III for a given family was also the person who had interviewed the family in the hospital for intervention II.

**Theoretical underpinning:** 2 theoretical frameworks were employed to guide the experimental interventions used in this study. The first was self-efficacy theory, a form of social learning theory in which self-perceptions of activity (‘efficacy expectations’) serve as important determinants of subsequent behaviour and stress modification. Efficacy perceptions can be enhanced through physiological arousal, persuasive information, modelling, and actual performance.

The second major theoretical base for the interventions was that of family stress theory, specifically the Double ABCX Model. In this model, family adaptation after crisis may be influenced by existing and new resources, the family’s perception of the surgical event, concurrent stressors, and family coping.

**Type of intervention:** multicomponent

**Components:** meetings, telephone support, education, counselling sessions

**Type of support:** appraisal + emotional

**Support provided by:** spouse and facilitated by nurse/counsellor

**Setting:** home

**One-to-one/group:** one-to-one (patient and spouse at home) and group (patient, spouse and nurse/co-ordinator)

**Face-to-face/remote (telephone/online):** face-to-face and telephone support

**Time of start after event/diagnosis:** NR

'Intensity' (no. contacts/sessions + session/contact duration): telephone support – weekly for 4 weeks then biweekly for 4 weeks
Counselling session - 1

**Total programme duration:** unclear

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR
<table>
<thead>
<tr>
<th>Study characteristics</th>
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<tbody>
<tr>
<td><strong>Methods</strong></td>
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<tr>
<td><strong>Study design:</strong> RCT (individual participant allocation)</td>
</tr>
<tr>
<td><strong>Number of centres:</strong> 1</td>
</tr>
<tr>
<td><strong>Country:</strong> USA</td>
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<tr>
<td><strong>Dates study conducted:</strong> May 2007 to October 2010</td>
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<tr>
<td><strong>Maximum follow-up:</strong> 12 months</td>
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<tr>
<td><strong>Participants</strong></td>
</tr>
<tr>
<td><strong>Inclusion criteria:</strong> inpatients receiving intravenous diuretics with a potential diagnosis of diastolic or systolic HF were screened. Confirmation of the diagnosis by the attending physician was required for enrolment. Outpatient study participants were identified from records of patients hospitalised in the previous 12 months for HF exacerbations and receiving care at the Heart Failure Clinic.</td>
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<tr>
<td><strong>Exclusion criteria:</strong> patients were ineligible if they had a serious mental illness or cognitive dysfunction; did not speak English; were unable to use the telephone; were being discharged to a long-term care facility or hospice care; were actively abusing drugs or alcohol; had open heart surgery within the previous 6 weeks; were actively participating in another HF self-management programme; were receiving active cancer treatment; or had a diagnosis of end stage renal disease</td>
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<tr>
<td><strong>N randomised:</strong> total: 267; intervention: 136; comparator: 131</td>
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<tr>
<td><strong>Diagnosis (% of participants):</strong> HF: 100%</td>
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<tr>
<td><strong>Age (mean ± SD):</strong> intervention: 70.4 ± 11.5; comparator: 67.9 ± 12.6</td>
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<td><strong>Percentage male:</strong> intervention: 48.1%; comparator: 48.1%</td>
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<tr>
<td><strong>Ethnicity:</strong> White – intervention: 77% (104), control: 71% (93), total: 74.1% (197) Black – intervention: 19.3% (26), control: 24.4% (32), total: 21.8% (58) Other – intervention: 3.7% (5), control: 4.6% (6), total: 4.1% (11)</td>
</tr>
<tr>
<td><strong>Socio-economic status (income, occupational class, education):</strong> Education % (n): High school graduate or less – intervention: 43% (58), control: 44% (58), total: 43% (115) Some college, technical or vocational – intervention: 34% (45), control: 38% (50), total: 36% (95) 4-year college or more – intervention: 24% (32), control: 18% (23), total: 21% (55)</td>
</tr>
</tbody>
</table>
Annual Income % (n):
≤ USD $19,000 – intervention: 27% (33), control: 24% (27), total: 26% (60)
$20,000 to $39,000 – intervention: 40% (49), control: 50% (56), total: 45% (105)
$40,000 or more – intervention: 33% (41), control: 26% (29), total: 30% (70)

Participants (supporters - if available):

Relationship to patient: fellow patient

Age (mean ± SD): see above

Sex (% male): see above

How identified/nominated/recruited: fellow patient

Interventions

Intervention description: patients randomised to the reciprocal peer support (RPS) intervention attended a 3-hour group session facilitated by a HF nurse practitioner (NP) and research associate. In the first session, attendees’ HF self-management challenges and questions were elicited, and action planning was introduced. Participants then received brief training in basic peer communication skills and participated in an ice-breaking exercise with their matched peer partner. Those not attending the first session received a telephone orientation and intervention materials via mail. At the end of the session, intervention participants were given a DVD demonstrating peer communication skills and a HF self-management workbook they could use to help guide their peer telephone calls. Peer partners were encouraged to talk at least weekly using an interactive voice response (IVR)–facilitated telephone platform that recorded call initiation, frequency, and duration that enabled partners to telephone without exchanging telephone numbers; set time periods in which calls could be blocked; and generate automated reminders every 7 days if no calls were attempted. The system also enabled participants to leave voice messages for research staff or care managers. Intervention participants were also offered 3 optional 1.5-hour group sessions facilitated by an NP and research associate at months 1, 3, and 6 during which participants were encouraged to share concerns, questions, strategies, and progress on their action plans. Research associates helped maintain intervention fidelity by encouraging non-directive facilitation of group discussions and completing a checklist of key areas covered and communication skills used in each session.

Theoretical underpinning: none described

Type of intervention: multicomponent

Components: social/peer support, optional group meetings, educational materials

Type of support: emotional

Support provided by: fellow participants

Setting: home

One-to-one/group: one-to-one, option to take part in 3 group sessions

Face-to-face/remote (telephone/online): remote (telephone), face-to-face (optional group sessions)

Time of start after event/diagnosis: within 12 months

'Intensity' (no. contacts/sessions + session/contact duration): weekly
Optional group sessions – 3 for 1.5 hours

Total programme duration: 6 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: 82% (101/124) made < 50% of 24 weekly peer calls during the 6-month intervention
### Heisler 2013 (Continued)

**Co-interventions:** none described

**Comparator description:** “enhanced” usual care

Patients randomised to nurse care management (NCM) attended an initial 1.5-hour NP-led HF self-management group in which participants were encouraged to ask questions and discuss their HF self-management challenges. The NPs provided their contact information and encouraged participants to schedule appointments with them. Each participant was also provided with HF self-management educational materials. NCM patients thus received enhanced usual care because although all hospitalised patients with HF during the study period were encouraged to follow-up in the Heart Failure clinic, not all patients used this service.

**Co-interventions:** none described

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### Outcomes

**Outcomes measured:** all-cause mortality, cardiovascular mortality, all-cause hospitalisation, HRQoL, social isolation and connectedness, adverse events

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### Notes

**Trial funding:** this research was supported by National Heart, Lung, and Blood Institute grant (R01 HL085420) and Michigan Institute for Clinical and Health Research (National Institutes of Health UL1RR024986)

**Declarations of interest:** none described

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### Horlick 1984

#### Study characteristics

**Methods**

**Study design:** RCT (individual participant allocation)

**Number of centres:** 3

**Country:** Canada

**Dates study conducted:** NR

**Maximum follow-up:** 6 months

**Participants**

**Participants (patients)**

**Inclusion criteria:** (a) age 65 years or less, (b) resident within 30 miles and physically able to attend classes, and (c) employed for 6 months prior to myocardial infarction and not intending to retire within 12 months

In order to have a sufficient number of individuals in our education-discussion groups some patients who were not eligible on criteria (a) and (c) were included but were able to attend

**Exclusion criteria:** not explicitly stated

**N randomised:** total: 105; intervention: 83; comparator: 22 (+ 44 non-eligible also included in study but not in analysis)

**Diagnosis (% of participants):** MI: 100%

**Age (mean ± SD):** intervention: 53.8 ± 8.1; comparator: 52.7 ± 7.8

**Percentage male:** intervention: 91.6%; comparator: 90%

**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):**

Labourer and farmer – intervention: 28 (33.7%), control: 6 (18.2%)
Professional, business, administration – intervention: 47 (56.6%), control: 21 (63.6%)
Horlick 1984 (Continued)

**Participants (supporters - if available):**

Relationship to patient: supporter 1: spouse; supporter 2: peer

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: fellow patient or spouse

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**Interventions**

**Intervention description:** The education-group discussion programme consisted of 6 weekly classes supervised by a nurse or a clinical psychologist. The educational component lasted 30 to 45 minutes and involved a presentation by either a cardiovascular nurse, nutritionist, nurse educator or recovered patient, depending upon the topic. Spouses were encouraged to attend.

Topics were
(a) how the heart works in health and disease
(b) physical recovery
(c) emotional recovery
(d) risk factors and intervention
(e) nutrition
(f) living with heart disease

This educational material expanded on information presented in the audiovisual programme the patients had received prior to their discharge from hospital. The group discussion portion of the programme followed immediately and lasted 45 minutes. It was open to patients only and encouraged free discussion of ideas, thoughts, and feelings about the heart attack and its effects. The group leader was a clinical psychologist or nurse educator with experience in group treatment. The leader encouraged the group (of 4 to 8) members to voice concerns and exchange information but did not lecture or otherwise direct the group. The goal was to provide a forum which would allow patients to "normalise" their experience and engage in group problem-solving.

**Theoretical underpinning:** NR

**Type of intervention:** multicomponent

**Components:** education, group meetings

**Type of support:** informational + emotional

**Support provided by:** spouse for education sessions, peers for group discussion

**Setting:** centre

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** following discharge

**'Intensity' (no. contacts/sessions + session/contact duration):**
1 class per week

Education component (with spouse): 30 to 45 minutes
Group discussion (with peers): 45 minutes

**Total programme duration:** 6 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none described

**Comparator description:** usual care

**Co-interventions:** none described
Horlick 1984 (Continued)

Outcomes

Outcomes measured: all-cause mortality, cardiovascular mortality, HRQoL, psychological well-being, heart disease risk factors, return to work, social isolation and connectedness, adverse events

Notes

Trial funding: NR
Declarations of interest: NR

Lang 2018

Study characteristics

Methods

Study design: RCT (pilot, individual participant allocation)
Number of centres: 1
Country: Scotland
Dates study conducted: April 2015 to June 2016
Maximum follow-up: 6 months

Participants

Participants (patients)

Inclusion criteria:
1. Male or female aged ≥ 18 years
2. Patients with heart failure, defined by the presence of at least one of the following symptoms at the time of screening:
   • paroxysmal nocturnal dyspnoea; or
   • orthopnoea; or
   • dyspnoea on mild or moderate exertion.
AND at least one of the following signs prior to study entry:
   • basal crepitations; or
   • elevated jugular venous pressure; or
   • lower extremity oedema; or
   • chest radiograph demonstrating pleural effusion, pulmonary congestion or cardiomegaly.
3. Patients with left ventricular ejection fraction (EF) ≥ 45% obtained within 6 months prior to randomisation and after any myocardial infarction (MI) or other event that would affect EF (ideally obtained by echocardiography, although radionuclide ventriculography and angiography are acceptable)
4. Provision of informed consent to participate

Exclusion criteria:
1. Patients who have undertaken cardiac rehabilitation (CR) within the last 6 months
2. Patients with severe chronic pulmonary disease defined as requiring home oxygen or hospitalisation for exacerbation within 12 months or significant chronic pulmonary disease in the opinion of the investigator
3. Patients who have any of the following contraindications to exercise testing or exercise training documented in their medical notes
   • Early phase after acute coronary syndrome (up to 2 days)
• Untreated life-threatening cardiac arrhythmias
• Acute heart failure (during the initial period of haemodynamic instability)
• Uncontrolled hypertension (systolic blood pressure (SBP) > 200 and/or diastolic blood pressure (DBP) > 100)
• Advanced atrioventricular block
• Acute myocarditis and pericarditis
• Symptomatic aortic stenosis
• Severe hypertrophic obstructive cardiomyopathy
• Acute systemic illness
• Intracardiac thrombus
• Progressive worsening of exercise tolerance or dyspnoea at rest over previous 3 to 5 days
• Significant ischaemia during low-intensity exercise (16 mmol/L or HbA1C > 9% or equivalent unit)
• Recent embolism
• Thrombophlebitis
• Recent-onset atrial fibrillation/atrial flutter (in the last 4 weeks)

4. Patients who are unable to understand the study information or unable to complete study procedures

5. Patients who are in a long-term care establishment or who are unwilling or unable to travel to research assessments or accommodate home visits

6. Patients judged to be unable to participate in the study for any other reason, for example, psychiatric disorder, diagnosis of dementia, life-threatening comorbidity

7. Patients participating in concurrent interventional research, which may overburden the patient or confound data collection

N randomised: total: 50; intervention: 25; comparator: 25

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention 71.8 ± 9.9; comparator: 76 ± 6.6

Percentage male: intervention: 36%; comparator: 56%

Ethnicity: 100% white

Socio-economic status (income, occupational class, education):
Education:
Postschool – intervention 7 (28%), control 7 (28%)
Degree - intervention 5 (20%), control 5 (20%)

Participants (supporters - if available):

Relationship to patient:
Relationship to patient, n (%):
Partner – intervention: 4 (40), control: 6 (60)
Son/daughter – intervention: 3 (30), control: 4 (40)
Sibling – intervention: 2 (20), control: 0 (0)
Friend – intervention: 1 (10) control: 0 (0)

Age (mean ± SD):
Intervention 59.3 ± 14.0
Control: 64.8 ± 11.6

Sex (% male):
Intervention – 30%
Control – 20%

How identified/nominated/recruited: participants’ unpaid caregivers invited to take part
**Intervention description:** It comprises the ‘Heart Failure Manual’ (REACH-HF manual), relaxation compact disc (CD), chair-based exercise digital versatile disc (DVD), a ‘Progress Tracker’ tool for patients and a ‘Family and Friends Resource’ for caregivers. Participating patients and caregivers worked through the REACH-HF manual over a 12-week period with facilitation by 2 trained cardiac nurses. The facilitators provided support as needed of which at least 1 was face to face and 2 were by telephone contacts. The REACH-HF manual incorporates 5 core informative and interactive elements covering a wide range of topics relating to living with/adapting to living with HF and includes: 1. A progressive exercise training programme, tailored according to initial fitness assessments, delivered as a walking programme or a chair-based exercise DVD, or a combination of the two (as selected by the patient). 2. Managing stress/breathlessness/anxiety. 3. HF symptom monitoring. 4. Taking medication. 5. Understanding HF (and why self-management helps). The REACH-HF manual was designed for patients with HFrEF (in terms of coverage of medication and explanations of condition). There was limited evidence to guide the development of the REACH-HF manual for patients with HFrpEF. Thus, it was adapted for this pilot study to allow evaluation in patients with HFrpEF. The majority of the self-management advice in all other sections of the REACH-HF manual is relevant to all patients with HF and corresponds to national HF guidelines. The core priorities for caregiver elements of the intervention were: 1. To facilitate improvement in patient HRQoL by helping them to achieve the core priorities for change. 2. To improve HRQol for caregivers by acting to maintain their own health and well-being.

**Theoretical underpinning:** In summary, the intervention drew on several theoretical perspectives, but key principles included building understanding of the condition to provide a rationale for change (Leventhal’s Common Sense Model) such as how physical fitness affects heart failure symptoms; building intrinsic motivation and promoting autonomy (Self-Determination Theory); promoting adaptation to living with heart failure and adopting an active rather than passive approach to coping and encouraging learning from experience through engagement in self-regulation activities (Control Theory). The elements aimed at managing stress and anxiety used psychological intervention processes based on cognitive behaviour therapy and mindfulness therapy.

**Type of intervention:** multicomponent

**Components:** exercise, social support, symptom monitoring, medication, self-management

**Type of support:** informational + instrumental + emotional

**Support provided by:** unpaid caregiver (partner, offspring, sibling or friend)

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:**
- Time since diagnosis of heart failure (years), n (%):
  - < 1, intervention: 6 (24), control: 4 (16)
  - 1 to 2, intervention: 7 (28), control: 7 (28)
  - > 2 intervention: 12 (48) control: 15 (60)

**'Intensity' (no. contacts/sessions + session/contact duration):** unspecified – minimum of 3 facilitated support sessions from nurses (when required, 1 face-to-face, 2 telephone minimum)

**Total programme duration:** 12 weeks

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR

**Adherence/fidelity assessed:**
- Adherence: 23 of the 25 (92%) intervention patients met the minimum adherence criteria of attendance, that is, attendance at the first face-to-face meeting with the facilitator and at least 2 further facilitator contacts (either face-to-face or telephone)

**Co-interventions:** none
**Comparator description:** usual care

**Co-interventions:** none

**Outcomes measured:** all-cause mortality, all-cause hospitalisation, cardiovascular hospitalisation, HRQoL, physical activity

**Notes**

**Trial funding:** This paper presents independent research funded by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research Programme (Grant Reference Number RP-PG-1210-12004). NB, CA, CJG and RST are also supported by the National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) South West Peninsula at the Royal Devon and Exeter NHS Foundation Trust; KJ by CLAHRC West Midlands and SS by CLAHRC East-Midlands.

**Declarations of interest:** RST is the lead for the ongoing portfolio of Cochrane reviews of cardiac rehabilitation. RST and HMD are named Scientific Advisors for the ongoing National Institute of Health and Care Excellence (NICE) updated clinical guidelines for the management heart failure (CG108). HMD is an ordinary member of the British Association for Cardiovascular Prevention and Rehabilitation (BACPR) council.

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**Study characteristics**

**Methods**

**Study design:** RCT (individual participant allocation)

**Number of centres:** 1

**Country:** USA

**Dates study conducted:** NR

**Maximum follow-up:** 12 weeks

**Participants**

**Participants (patients)**

**Inclusion criteria:** the population of interest was CABG patients and their family member caregivers. Patients who had nonemergent CABG surgery at a major urban academic medical centre and who lived within a 1-hour drive of the facility were the focus of this study. The distance criterion was included because part of the intervention required bringing patients back to the hospital.

Families were defined as those individuals either related to or sharing a household with the patient. The family member included in the study was designated by the patient as the person holding primary responsibility for care-giving following discharge.

**Exclusion criteria:** see above

**N randomised:** total: 45; intervention: 22; comparator: 23

**Diagnosis (% of participants):** CABG: 100%

**Age (mean ± SD):** total: 60.2 ± 10.6

**Percentage male:** total 71%

**Ethnicity:** 93% white

**Socio-economic status (income, occupational class, education):**

Education:
66% completed high school
22% completed college
Interventions

**Intervention description:** The study group received the standard discharge instruction videotape, handout, and home visit received by the control group. In addition, the study group received a copy of the videotape to be viewed as desired at home. A structured, individualised, predischARGE counselling session was provided to the patient and at least one family member after they viewed the standard discharge videotape. The session was conducted by a research assistant, a cardiac clinical nurse specialist. It focused on physical feelings and emotional adjustment of the patient following discharge, as well as on the role of the family in the patient’s recovery, and strategies for handling interpersonal conflict. Beginning the day after discharge and continuing for 6 weeks, and biweekly for the next 6 weeks, dyads in the study group also received telephone calls from the 2 investigators to the patient and the designated family member. The phone conversations followed a semi structured format in which content was geared to provide information that the patient and family caregiver would need at that stage of the patient’s recovery. Each conversation began by the investigators asking a series of questions about how the patient or family member was doing, then moved on to the instructional content planned for that call. During the first 2 weeks of the recovery period, the telephone follow-up calls began with questions to assess the physical and emotional condition of the patient and family caregiver. Then instruction was provided about signs and symptoms of complications (e.g. bleeding, infection, sudden weight gain), and how to handle problems commonly encountered during the early postoperative weeks (e.g. pain, difficulty sleeping, blues, mood swings). Patients were also encouraged to engage in risk-reducing behaviours (e.g. beginning to exercise, reducing fat and salt in the diet, stopping smoking). Family members received instruction about how to encourage and facilitate these risk-reducing behaviours. Later telephone calls reinforced the earlier instruction about problems and risk-reducing behaviours. They also provided information needed during the remainder of the recovery period. Throughout the intervention, emphasis was placed on providing emotional support, enhancing the patient’s self-efficacy, and helping family members to view the patient as self-efficacious. A “heart-prudent” dinner and group support session for patients and family members were held at the medical centre approximately 4 weeks post discharge. The dietician-planned dinner was low fat and low sodium but included foods that patients would not expect to be able to eat. Dietary instruction, recipes for low-fat, low-salt meals, and a display of cookbooks were provided. Following the dinner, a psychiatric clinical nurse specialist skilled in group therapy led an hour-long group discussion. Patients and family members were encouraged to share their experiences.

**Theoretical underpinning:** the design for the experimental treatment was based on adult learning theory, self-efficacy theory, and literature regarding the recovery trajectory

**Type of intervention:** multicomponent

**Components:** education, social support, counselling

**Type of support:** instrumental + emotional

**Support provided by:** family or member of household

**Setting:** home, primary for dinner event

**One-to-one/group:** one-to-one and group

**Face-to-face/remote (telephone/online):** face-to-face and remote (telephone)

**Time of start after event/diagnosis:** 3 to 4 days after surgery
'Intensity' (no. contacts/sessions + session/contact duration): bi-weekly telephone calls to dyads (participant and supporter)

Total programme duration: 6 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: NR

Co-interventions: none

Comparator description: the patient and the designated family member (if available) viewed the videotape containing standard discharge instructions within 48 hours prior to discharge. After the showing of the videotape, a staff nurse answered participants’ questions and provided a sheet of written instructions. All patients received at least one standard follow-up home health visit (the range was 1 to 4 visits).

Co-interventions: none

Outcomes measured: HRQoL, psychological well-being, patient satisfaction

Notes

Trial funding: partial funding for this study was provided by the Designated Research Initiative Fund of the Office of Graduate Studies and Research, University of Maryland at Baltimore; by the School of Nursing, University of Maryland at Baltimore; and by PI Chapter, Sigma Theta Tau, International

Declarations of interest: NR

Liljeroos 2012

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 2

Country: Sweden

Dates study conducted: January 2005 to December 2008

Maximum follow-up: 24 months

Participants

Inclusion criteria: being a dyad consisting of a patient diagnosed with verified HF according to the European Society of Cardiology guidelines, in NYHA class II-IV, recently discharged from hospital (i.e. 2 to 3 weeks) following acute exacerbation of HF, and cohabiting with a partner in a marriage-like relationship

Exclusion criteria: diagnosed dementia or other severe psychiatric illnesses, drug abuse, difficulties for one of the dyad members to understand or read the Swedish language, planned cardiac surgery, or participation in other studies

N randomised: total: 155; intervention: 71; comparator: 84

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 69.4 ± 13.6; comparator: 72.9 ± 10.1

Percentage male: intervention: 69.1%; comparator: 80.9%
Ethnicity: NR

Socio-economic status (income, occupational class, education):

Education, %:
- Elementary school - control: 65%; intervention: 59%
- High school - control: 26%; intervention: 32%
- University - control: 9%; intervention: 9%

Years at school, mean ± SD - control: patient 9.8 ± 6.1, partner 9.9 ± 3.5; intervention: patient 9.4 ± 4.7, partner 9.7 ± 3

Participants (supporters - if available):

Relationship to patient: partner who acted as the informal caregiver

Age (mean ± SD): intervention: 67.1 ± 12.1; control: 69.5 ± 10.5

Sex (% male): intervention: 69.1; control: 80.9

How identified/nominated/recruited: being a dyad consisting of a patient diagnosed with verified HF according to the European Society of Cardiology guidelines, in NYHA class II-IV, recently discharged from hospital (i.e. 2 to 3 weeks) following acute exacerbation of HF, and cohabiting with a partner in a marriage-like relationship

Interventions

Intervention description: The dyads in the intervention group received care as usual. In addition, they participated in an educational and psychosocial intervention, which included psychosocial support to maintain and strengthen the dyads’ physical and mental functions and perceived control.

The intervention was delivered in 3 modules through nurse-led face-to-face counselling, a computer-based program and written materials. The sessions took place 2, 6 and 12 weeks after discharge from hospital. Each of the 3 modules contained cognitive, supportive, and behavioural components and outcomes. All sessions included education on heart failure and development of problem-solving skills to assist the dyads in recognising and modifying factors that contribute to psychological and emotional distress. The intervention focused on changing thoughts and behaviours, and implementing strategies for self-care behaviours.

Briefly, the first visit aimed at increasing the dyads’ knowledge of the disease and treatment, improving mental and physical functions, and introducing self-care behaviours such as daily weight monitoring, adherence to medication, and a flexible diuretic intake.

The second visit aimed at increasing knowledge of the rationale for lifestyle changes, assessing the patient’s need for support, modifying and strengthening caregiver behaviour, as well as identifying barriers for lifestyle changes.

The third visit focused on increasing knowledge of heart failure care and outcomes. It was a reinforcement of the intervention, and included an assessment of outcomes on support, behaviour, and repeated computer-based education. The visit also assessed the partner’s need for support and perceived caregiver burden, in order to find strategies to improve control and self-care behaviour, and plan for the future. The sessions were conducted in the dyads’ homes or in the heart failure clinic, depending on the dyad’s preference. Each session lasted approximately 60 minutes.

All nurses were experienced HF nurses who had received special training on how to perform the intervention before the study. The nurses received 3 days of theoretical training followed by individual and practical training. To ensure accuracy of the intervention, the study team regularly assessed the nurses’ competence to deliver the intervention through observations and consultations.

Theoretical underpinning: the theoretical framework for the study was based on a conceptual health promotion model developed by Stuifbergen et al. The model focuses on enhancing self-effi-
Cochrane Library
Trusted evidence.
Informed decisions.
Better health.
Cochrane Database of Systematic Reviews

**Liljeroos 2012 (Continued)**

Cacy and has successfully been used as an educational programme with supportive telephone follow-up. The authors describe that barriers and resources can be enhanced by education and support, and help individuals to participate in health-promoting behaviours, such as self-care.

**Type of intervention:** multicomponent

**Components:** nurse-led face-to-face counselling, a computer-based program, and written materials

**Type of support:** informational + instrumental + emotional

**Support provided by:** partner

**Setting:** the sessions were conducted in the dyads' homes or in the heart failure clinic, depending on the dyad's preference

**One-to-one/group:** group: nurse to patient-partner dyad

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 2, 6, and 12 weeks after discharge from hospital

'Intensity' (no. contacts/sessions + session/contact duration): the intervention was delivered in 3 modules through nurse-led face-to-face counselling, a computer-based program, and written materials. The sessions took place 2, 6, and 12 weeks after discharge from hospital.

**Total programme duration:** 6 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** the dyads in the control group received care as usual, both in the hospital and the outpatient clinic. Care as usual included optimised treatment according to international guidelines, and verbal and written patient education. Standard care focused on the patient’s needs, and although partners were able to join in, they were not systematically invited to participate in the care.

**Co-interventions:** none

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: all-cause mortality, all-cause hospitalisation, cardiovascular hospitalisation, HRQoL, psychological well-being</th>
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<th>Notes</th>
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**Lindsay 2009**

**Study characteristics**

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Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)
Copyright © 2023 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
Maximum follow-up: 9 months

**Participants (patients)**

**Inclusion criteria:** this RCT drew a sample (n = 108) of men and women aged 50 to 74 from general practitioners’ (GPs) CHD registries. The sample was drawn from a deprived area of Greater Manchester, UK, because nearly half of the electoral wards in this area are in the top 10% of the most multiply deprived wards (i.e. including measures of resources and living standards) in UK, including an increased risk for CHD

**Exclusion criteria:** NR

**N randomised:** total: 108; intervention: 54; comparator: 54

**Diagnosis (% of participants):** NR

**Age (mean ± SD):** total 62.9 years (SD NR)

**Percentage male:** total 66.7%

**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):** "Our sample was drawn from a deprived area of Greater Manchester, UK, because nearly half of the electoral wards in this area are in the top 10% of the most multiply deprived wards (i.e. including measures of resources and living standards) in UK, including an increased risk for CHD."

**Participants (supporters - if available):**

**Relationship to patient:** peers, facilitated by researchers

**Age (mean ± SD):** 50 to 74 (participants)

**Sex (% male):** NR

**How identified/nominated/recruited:** NR

**Interventions**

**Intervention description:** the overriding aim of this 9-month randomised controlled trial (RCT) was to test whether the type of moderation (community-based, moderated or unmoderated, and peer-support-based access) to an Internet health portal could influence health behaviours among men and women with CHD

All participants received a new home computer and 1-year broadband subscription. The experimental group received access to the password-protected portal.

Access to the project website was through a purpose-built, password-protected portal where the experimental group could interact in one of 5 dedicated closed groups, with facilitation from the researchers for the first 6 months. Controls were also divided into 5 groups for ease of managing recruitment and introductory project meetings. All participants were given new computers and a 1-year broadband subscription; however, only the experimental group received training and access to the project portal. A technician installed the computers in the participants’ homes and also assisted with any technical difficulties that arose for the duration of the project. Weekly drop-in sessions and phone in support were also available to both groups.

The portal social architecture was initially constrained by the terms of the research design in the sense that mixing between successively recruited groups was prevented until each had the benefit of 6 months’ facilitated access. This was construed as a period of socialisation and familiarisation with the online environment, which took place within a safe private space for 10 people who had met one another in person at an introductory meeting and training session. In addition to the opportunity to meet, participants’ real names were used online, and there was the option of adding a photograph of oneself and a biography to one’s user profile. Thus, communication between participants was not anonymous.
The website contained a glossary and information resources about CHD, diet, exercise and smoking.

Links and references to local community resources where they could seek help and advice were also given. The moderators began discussion topics during the moderated phase. Despite the fact that most participants had used a computer before, their computer skills and experience were generally low, so there were a lot of discussions and facilitation around how to use a computer and the Internet. The remaining 3 months of the project were unmoderated and all the members of the experimental group formed one ‘big group’. At this stage, real names were still used, but there was certain anonymity insofar as most participants had not met face-to-face.

The portal’s discussion forums were moderated by 2 researchers, one male and one female, and both considerably younger than the participants.

Log data on portal use were collected, showing ‘hits’ on different pages and use of the various tools available to participants (e.g. logging on and off, posting and browsing messages).

During the moderated phase, participants had access to two forms of communication with moderators within the portal: discussion forums and one-to-one instant messaging. Within the discussion forums, the moderators’ primary task was to stimulate discussions and encourage participants to join in.

Moderators also joined in open discussion threads, providing information where appropriate. The moderators also fulfilled a surveillance function, checking all new posts daily. In the unmoderated phase, the moderators still performed the same surveillance role, but they no longer started new threads, so control over content passed to participants.

Theoretical underpinning: none

Type of intervention: multicomponent

Components: online social support, online education resources

Type of support: informational + instrumental + emotional

Support provided by: researcher during moderated phase, peers during unmoderated phase

Setting: community-based

One-to-one/group: both: participants had access to 2 forms of communication with moderators within the portal: discussion forums and one to one instant messaging

Face-to-face/remote (telephone/online): remote but weekly drop-in sessions and phone support available (both intervention and control)

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): NR

Total programme duration: 9 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: no

Adherence/fidelity assessed: no

Co-interventions: none

Comparator description: all participants were given new computers and a 1-year broadband subscription; however, only the experimental group received training and access to the project portal. A technician installed the computers in the participants’ homes and also assisted with any technical difficulties that arose for the duration of the project. Weekly drop-in sessions and phone-in support was also available to both groups, although the experimental group was better informed about the drop-in sessions because they were promoted via the portal.

Co-interventions: none
Outcomes measured: psychological well-being, heart disease risk factors, physical activity, social isolation and connectedness

Notes
Trial funding: Economic and Social Research Council (grant no. RES-341-25-0037); Higher Education Funding Council for England Social Research Infrastructure Fund
Declarations of interest: none described

Study characteristics
Methods
Study design: RCT (individual participant allocation)
Number of centres: 2
Country: USA
Dates study conducted: NR
Maximum follow-up: 6 months

Participants
Participants (patients)
Inclusion criteria: inclusion criteria for patients were (a) diagnosis of coronary artery bypass surgery (CABS), (b) age of 19 years or older, (c) enrolment in outpatient CR, (d) married or living with a spouse/partner for more than 1 year, (e) the spouse/partner willing to participate, (f) no history of psychiatric illness, and (g) classified as low to moderate risk for occurrence of cardiac events during exercise. Inclusion criteria for partners were the same except for the CABS diagnosis, and they needed permission from their primary care physician to participate.

Exclusion criteria: exclusion criteria for patients and partners were: (a) orthopaedic problems that would prevent walking on a treadmill while speed and incline are gradually increased until maximum effort is reached, (b) history of cardiac arrest, sudden death, or complex dysrhythmias at rest, (c) resting systolic BP > 200 mmHg or diastolic > 100 mmHg, (d) a concomitant diagnosis of renal failure or anaemia, (e) severe chronic obstructive pulmonary disease (FEV₁ < 1 litre), or (f) poorly controlled diabetes (diabetic ketoacidosis within past 6 months or a current HgAlC > 11), (g) a diagnosis of heart failure class I-III with an ejection fraction < 35% and is unstable (unstable was defined as not being on the same medications for 1 month and clinical evidence of decompensated heart failure)

N randomised: total: 35 (couples); intervention: 18 (couples); comparator: 17 (couples)
Diagnosis (% of participants): CAGB: 100%
Age (median (range)): intervention: 64 (33 to 77); comparator: 66 (40 to 77)
Percentage male: intervention: 88.2%; comparator: 76.5%
Ethnicity:
Intervention: white 88.2%; Hispanic 11.8%
Comparator: white 100%
Socio-economic status (income, occupational class, education):
High school or less - intervention: 41.2%, control: 29.4%
Some college - intervention: 17.6%, control: 5.9%
College degree or postgraduate - intervention: 41.2%, control: 64.7%
Participants (supporters - if available):
Macken 2014 (Continued)

**Relationship to patient:** spouse/partner

**Age (mean ± SD):** median 62, range: 33 to 76

**Sex (% male):** 12%

**How identified/nominated/recruited:** couples recruited together inclusion criteria: married or living with a spouse/partner for more than 1 year, (e) the spouse/partner willing to participate

**Interventions**

**Intervention description:** both CR programmes employ Master’s prepared exercise specialists and primarily Bachelor’s prepared registered nurses, and are nationally certified by the American Association of Cardiovascular and Pulmonary Rehabilitation. 30 individualised exercise plans were implemented in a hospital-based rehabilitation facility that included aerobic, strength, and flexibility exercises, 3 days a week for 6 to 12 weeks (18 to 36 sessions). Group education classes in nutrition, exercise, smoking cessation, cardiac knowledge, stress management, medications, and lifestyle change were regularly offered. In the PaTH group, patients and partners received the individualised treatment plan and counselling. In the UC group, only patients received the individualised treatment plan and counselling, and spouses in this group attended the group educational sessions. However, the CR programme at the community hospital had an established programme that allowed spouses/family members to exercise at the facility. The effects of this variation on the planned intervention were analysed by comparing differences between partners at both sites.

**Theoretical underpinning:** no

**Type of intervention:** multicomponent

**Components:** exercise, group education, individualised treatment plans and counselling

**Type of support:** instrumental + emotional

**Support provided by:** partner

**Setting:** centre-based

**One-to-one/group:** patient and partner

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 2 to 3 weeks post hospital discharge

‘Intensity’ (no. contacts/sessions + session/contact duration): 3 days a week for 6 to 12 weeks (18 to 36 sessions)

**Total programme duration:** 6 to 12 weeks

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** patients and partners received the individualised treatment plan and counselling

**Adherence/fidelity assessed:**

Attendance at sessions:

CR sessions, median (range):

Intervention: 18 (11 to 36); control: 18 (12 to 36)

CR sessions planned, median (range):

Intervention: 18 (18 to 36); control: 18 (12 to 36)

Education sessions, median (range):

Intervention: 18 (7 to 19); control: 14 (9 to 18)

Patients in both groups attended the same median number of CR sessions (18) with a range of 11 to 36 sessions for the PaTH group and 12 to 36 sessions for the usual care group. This indicated that the length of the CR programme varied between 6 and 12 weeks, and was largely dependent upon insurance benefits. There was no evidence of a difference in number of CR sessions between groups.
Co-interventions: none

Comparator description: in the UC group, only patients received the individualised treatment plan and counselling, and spouses in this group attended the group educational sessions. However, the CR programme at the community hospital had an established programme that allowed spouses/family members to exercise at the facility. The effects of this variation on the planned intervention were analysed by comparing differences between partners at both sites.

Co-interventions: none

Outcomes measured: HRQoL, psychological well-being, heart disease risk factors, physical activity

Notes

Trial funding: Nellie House Craven Scholarship 2010–2012 to L. Macken, Grant #NR010923 from National Institute for Nursing Research, National Institutes of Health, and the University of Nebraska Clinical Research Center, Research Support Fund to B. Yates

Declarations of interest: none described
Maskarinec 2015 (Continued)

Interventions

**Intervention description:** Hula intervention

**Theoretical underpinning:** social cognitive theory

**Type of intervention:** multicomponent

**Components:** exercise and social support

**Type of support:** instrumental

**Support provided by:** fellow patients

**Setting:** NR

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** NR

'Intensity' (no. contacts/sessions + session/contact duration): 3 classes per week

**Total programme duration:** 12 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** NR

**Comparator description:** usual care

**Co-interventions:** NR

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Outcomes

**Outcomes measured:** no outcomes of interest

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Notes

**Trial funding:** Funding for this project was received from the National Institute on Minority Health and Health Disparities of the National Institutes of Health, Grant No. P20MD000173

**Declarations of interest:** NR

Mohammadpourhodki 2019

Study characteristics

**Study design:** RCT (individual participant allocation)

**Number of centres:** 1

**Country:** Iran

**Dates study conducted:** 2016

**Maximum follow-up:** 30 days

Participants

**Participants (patients)**

**Inclusion criteria:** MI diagnosed for the first time, not having psychological disorders, having stability in vital sign, age between 42 and 65 years, not having known anxiety, interested to take part in study, and possibility of phone call

**Exclusion criteria:** exclusion criteria were death of patient, unwillingness to co-operate
Mohammadpourhodki 2019 (Continued)

Randomised: total: 60; intervention: 30; comparator: 30

Diagnosis (% of participants): MI: 100%

Age: Intervention:
- 41 to 50 years – 7 (38.9%)
- 51 to 60 years – 23 (54.8%)
Comparator:
- 41 to 50 years – 11 (61.1%)
- 51 to 60 years – 19 (45.2%)

Percentage male: intervention: 48.7%; comparator: 51.3%

Ethnicity: NR

Socio-economic status (income, occupational class, education):
Education:
- Illiterate – intervention: 40.7%, control: 59.3%
- Primary – intervention: 80%, control: 20%
- Diploma – intervention: 50%, control: 50%
- Higher diploma – intervention: 33.3%, control: 66.7%

Participants (supporters - if available):

Relationship to patient: peers

Age (mean ± SD): see above

Sex (% male): see above

How identified/nominated/recruited: see above

Interventions

Intervention description: peers were taught by the researcher during 3 sessions. Each of these sessions lasted about 90 minutes. Due to the purpose of the study, the content of the educational was determined. Peers after making the necessary preparations they were allowed to educate the patients: the intervention performed 72 hours after the MI. intervention group by the peer trained during 2 training sessions and other group only received the routine education.

Theoretical underpinning: none

Type of intervention: social support

Components: peer education sessions

Type of support: informational

Support provided by: peers were taught by the researcher during 3 sessions. Each of these sessions lasted about 90 minutes. Due to the purpose of the study, the content of the educational was determined. Peers after making the necessary preparations were allowed to educate the patients.

Setting: NR

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: 72 hours

'Intensity' (no. contacts/sessions + session/contact duration): NR

Total programme duration: NR

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: NR
Mohammadpourhodki 2019 (Continued)

Co-interventions: none
Comparator description: usual care (routine education)
Co-interventions: none

Outcomes

Outcomes measured: psychological well-being

Notes

Trial funding: "This article is the outcome of an investigation project at the Zabol University of Medical Sciences which is sponsored by the university and the support is acknowledge."
Declarations of interest: none described

Nahlen-Bose 2016

Study characteristics

Methods

Study design: RCT (individual participant allocation)
Number of centres: 1
Country: Sweden
Dates study conducted: 2011 to 2013
Maximum follow-up: 12 months

Participants

Participants (patients)
Inclusion criteria: diagnosed with HF: classified as New York Heart Association (NYHA) class II–III and aged over 18 years
Exclusion criteria: cognitive dysfunction, a life-threatening disease such as cancer or primary organ failure and/or severe psychiatric diagnosis such as psychosis or severe depression, and not being able to understand the Swedish language
N randomised: total: 103; intervention: 52; comparator: 51
Diagnosis (% of participants): HF: 100%
Age (mean ± SD): intervention: 72.2 ± 9.7; comparator: 69 ± 8.6
Percentage male: intervention: 65.9%; comparator: 72%
Ethnicity: NR
Socio-economic status (income, occupational class, education):
Education, %:
Compulsory school - control: 24.0, intervention: 20.5
Upper secondary school - control: 30.0, intervention: 47.7
University - control: 46.0; intervention: 31.8
Participants (supporters - if available):
Relationship to patient: peers
Age (mean ± SD): NR
Sex (% male): NR
Interventions

**Intervention description:** In addition to standard health care the participants in the intervention group also received Coping Effectiveness Training (CET), a manual-based group intervention. The purpose of CET was to improve the participants’ skills to appraise stress, to teach them a number of techniques to cope with stress in an adaptive rather than a maladaptive manner, and to give them an opportunity to interact with other people living with CHF. The participants received 7 x 90-minute weekly CET sessions and a workbook with a brief summary of every session as well as home assignments. Table 1 displays the theme and home assignment for each session, which was introduced by the group leader. The sessions were built on active participation from the participants and the theme for each session was discussed in the groups. The participants got to practise, for instance, a problem-solving method and a relaxation training which was also included in some of the home assignments. The groups were led by a cardiac nurse specialised in CHF who received supervision from a psychologist, which included jointly leading the first group and subsequently receiving supervision after each CET session. In total there were 5 intervention groups with 7 to 12 people in each group. Both the workbook and the manual were forward translated into Swedish and adapted to patients with CHF from Kennedy’s original books applying CET to patients with SCI, by the first and fifth authors in this study.

**Theoretical underpinning:** Coping Effectiveness Training (CET) is based on a theory of stress and coping and targets coping styles in order for the patients to use adaptive coping styles rather than maladaptive coping styles

**Type of intervention:** social support only

**Components:** the participants received 7 x 90-minute weekly CET sessions and a workbook with a brief summary of every session as well as home assignments

**Type of support:** not clear

**Support provided by:** peer

**Setting:** NR

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** NR

**'Intensity' (no. contacts/sessions + session/contact duration):** NR

**Total programme duration:** 7 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: yes, home assignments focussed on tailoring theme to individual

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** the participants in the control group received standard health care for patients with HF such as nurse-led heart failure outpatient clinic, cardiology specialist outpatient or primary health care

**Co-interventions:** none

**Outcomes measured:** all-cause mortality, cardiovascular mortality, all-cause hospitalisation, cardiovascular hospitalisation, HRQoL, psychological well-being, social isolation and connectedness

**Notes**

**Trial funding:** this work was supported by The Swedish Heart and Lung Association, Solstician foundation, Department of Cardiology Danderyd Hospital, Stockholm, Sweden, Karolinska Institutet Department of Clinical Sciences Danderyd Hospital, Stockholm County Council (ALF), Sophia-hemmet Research Foundation, and Mats Kleberg Foundation

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**How identified/nominated/recruited:** other HF patients recruited to intervention
Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 1

Country: Sweden

Dates study conducted: August 1996 to January 2000

Maximum follow-up: 9 years

Participants

Participants (patients)

Inclusion criteria: age 35 to 75, acute myocardial infarction (AMI), coronary artery bypass grafting, or percutaneous coronary intervention

Exclusion criteria: women over 75 years of age, women who did not live in the hospital catchment area, women who did not speak Swedish, and women who had serious comorbidity that prevented them from taking part in the programme

N randomised: total: 237; intervention: 112; comparator: 125

Diagnosis (% of participants):

- MI: intervention 53.6%, control 48%
- CABG/PCI: intervention 37.5%, control 32.8%
- Angina: intervention 8%, control 19.2%
- HF: intervention 8%, control 19.2%

Age (mean ± SD): intervention: 61.4 ± 9.1; comparator: 61.6 ± 9.1

Percentage male: intervention: 0%; comparator: 0%

Ethnicity: NR

Socio-economic status (income, occupational class, education):

Mandatory education: intervention 63.1%, control 61.5%

Participants (supporters - if available):

Relationship to patient: none, other group members

Age (mean ± SD): NR

Sex (% male): 0%

How identified/nominated/recruited: other patients recruited to the study

Interventions

Intervention description: group-based cognitive behavioural intervention (later described as group-based psychosocial intervention programme)

Educational group sessions were aimed at improving knowledge of the heart, healthier lifestyle, training skills, and improving mastery of marital stress, coping with serious illness, counteracting
anxiety and depression, improving social relations and social support, and practising relaxation techniques.

Two nurses with clinical experience from coronary care and independent consultation work with cardiac patients were recruited for this intervention. They received intensive training from an expert clinical psychologist. The contents of the programme were focused on women's psychosocial risk-factor profile and attempted to control behavioural risk factors, attenuate negative emotions, improve coping skills, reduce stress, and improve social support.

The intervention methodology followed basic principles of cognitive behavioural intervention programs: communication of cardiovascular health knowledge, methods for self-monitoring, recognising cognitive distortions, cognitive restructuring, skills training, and role playing.

Groups met in the same location throughout the programme, and the composition of the group was largely preserved.

Sessions began with 5 to 10 minutes of relaxation, a technique to decrease arousal. Each session was focused on a given topic, with prepared educational material. Topics ranged from the cardiovascular system and its pathophysiology to clinical and behavioural risk factors.

Opportunities for smoking cessation, for physical exercise, and for weight change were offered. The therapist made sure that every patient talked at each session. Some of these female patients reported never having talked freely in groups before. Within each session patients considered self-monitoring skills, recognition of cognitive distortions, and cognitive restructuring in their interactions.

Metaphors were frequently used to illustrate and facilitate understanding of adverse behavioural contexts. These were intended to help the patient to become aware of alternative interpretations in her own life context and facilitate reinterpretations of life situations that were less threatening and emotionally loaded. Further topics were concerned with the negative emotional consequences of heart disease, hostility, depression, exhaustion, and stressful events at work and in the family, and were discussed along with strategies to cope with such emotions. Social relations, social roles, and social supports were highlighted, and traditional male and female roles in the work and family spheres were discussed. Finally, existential questions about life and death were raised along with strengths and weaknesses in each patient's personal life. By the end of the program, patient groups had become cohesive and mutually supportive of their participants, and many of them continued to meet socially long after the course.

In all, 20 groups were run, each for a period of 1 year, and a total of 400 sessions were prepared, conducted, and monitored.

**Theoretical underpinning:** NR

**Type of intervention:** education group incorporating social support

**Components:** education groups

**Type of support:** instrumental + emotional

**Support provided by:** other group members with CHD

**Setting:** NR

**One-to-one/group:** group (4 to 8)

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 4 months

**'Intensity' (no. contacts/sessions + session/contact duration):** 20 sessions, each 2 to 2.5 hours long, weekly for 10 weeks then monthly

**Total programme duration:** 1 year

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR
Orth-Gomer 2009 (Continued)

Adherence/fidelity assessed: NR

Co-interventions: none

Comparator description: usual care only

Co-interventions: none

| Outcomes | Outcomes measured: all-cause mortality, psychological well-being, heart disease risk factors |

Notes

Trial funding: the study was supported by Swedish Labor Market Insurance Company, the Swedish Medical Research Council (19X-11629), the Osher Foundation of the Center for Integrative Medicine at Karolinska Institutet, and grants from the National Institutes of Health (HL45785 and HL36588 to K.O.-G. and N.S.)

Declarations of interest: none described

Parent 2000

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 1

Country: Canada

Dates study conducted: June 1994 to September 1994

Maximum follow-up: 4 weeks

Participants

Participants (patients)

Inclusion criteria: criteria for inclusion in the sample were male gender, ages 40 to 69, and having first-time CABG surgery

Exclusion criteria: at the time of this study, CABG surgery was performed predominantly on men; therefore, women were not included in the sample for both time considerations and issues of sample size feasibility. Older and younger patients were not included, as they may have differed in terms of physiologic recovery. Patients were excluded if they had valve dysfunction, signs or symptoms of unstable arrhythmias or heart failure, or history of physically disabling illness. No patients had a history of, or were receiving treatment for, psychiatric illness.

N randomised: total: 67; intervention: 36; comparator: 631

Diagnosis (% of participants): CABG: 100%

Age (mean ± SD): intervention: 57.6 ± 7.4; comparator: 55.9 ± 7.8

Percentage male: intervention: 100%; comparator: 100%

Ethnicity: NR

Socio-economic status (income, occupational class, education):

Occupation:
Professional- control: 8%, intervention: 4%
Managerial – control: 39%, intervention: 44%
Skilled worker – control: 21%, intervention: 19%
Retired – control: 32%, intervention: 33%

Participants (supporters - if available):
Relationship to patient: none - former CABG patients

Age (range): 40 to 69 years

Sex (% male): 100%

How identified/nominated/recruited: 3 former male patients who had had CABG and were between the ages of 40 and 69 were identified for the intervention. They were selected by the research co-ordinator on the basis of their ability to verbalise their enthusiasm, to stimulate motivation, and to share their successful rehabilitation after cardiac surgery.

Interventions

Intervention description: "The intervention consisted of 3 supporting visits by a volunteer former patient. This one-on-one support intervention provided vicarious experience. The former patient provided the study subjects with "living proof" of a successful surgery and rehabilitation program. Emotional and informational support given during the visit was intended to reassure subjects, coach them toward activity, and reinforce risk factor reduction. The supportive acts included listening, responding to concerns, affirmation, feedback, and social comparisons. The discussions were totally based on questions from the study subjects. The interventions were tailored to the individual patient's needs. Social comparison opportunities provided by former patients enable study subjects to evaluate themselves against individuals who are, in some sense, similar to themselves. To the extent that coronary patients compare their own situation exclusively with that of healthy others, they are likely to experience more dissatisfaction and anxiety than if they compare their position to that of individuals with the same problems of adjustment. The model provided by the former patient of a healthy and active lifestyle was intended to strengthen subjects' expectancies concerning their capacities to achieve meaningful behavioral change."

Theoretical underpinning: Bandura's social learning theory and its derived self-efficacy theory focus on the effect of psychological and environmental factors on behaviour. Self-efficacy expectation is the perceived self-confidence to perform a target activity.

Type of intervention: social support only

Components: visits from supporter

Type of support: informational + appraisal + emotional

Support provided by: former male patients who had had CABG

As a group, the 3 former patients were given 6 hours of training by the research co-ordinator on interaction principles (how to listen empathically and to reflect the patient's feelings) and on cardiovascular disease and treatment. The former patients were given opportunities to practise their skills through role play activities and practice sessions with a patient, under the supervision of the research co-ordinator.

Setting: centre (hospital)

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: 1st visit - 24 hours before surgery

'Intensity' (no. contacts/sessions + session/contact duration): 3 supporting visits from a volunteer former patient: the first 24 hours before surgery, the second on the fifth postoperative day, and the third 4 weeks after surgery

Total programme duration: 4 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: NR

Co-interventions: none
Comparator description: usual care
Co-interventions: none

Outcomes measured: psychological well-being, adverse events

Notes
Trial funding: NR
Declarations of interest: NR

Study characteristics

Methods
Study design: RCT (individual participant allocation)
Number of centres: 1
Country: Canada
Dates study conducted: April 2006 - February 2007
Maximum follow-up: 9 weeks

Participants
Inclusion criteria: Participants included men and women who:
(a) were having first-time non-emergency CABG surgery;
(b) were judged ready for discharge;
(c) were being discharged to home (either their own or to family/friends);
(d) had access to and were able to communicate over a telephone;
(e) were able to read, write and understand English.
Exclusion criteria: NR
Randomised: total: 101; intervention: 49; comparator: 52
Diagnosis (% of participants): CABG: 100%
Age (mean ± SD): intervention: 62 ± 11 ; comparator: 64 ± 10
Percentage male: intervention: 84%; comparator: 83%
Ethnicity: NR
Socio-economic status (income, occupational class, education):
Less than high school – comparator: 19%, intervention: 12%
High school - comparator: 42%, intervention: 20%
College/university - comparator: 35%, intervention: 53%
No response - comparator: 4%, intervention: 15%
Participants (supporters - if available):
Relationship to patient: peer volunteer
Age (mean ± SD): 69 ± 5
Sex (% male): 79%

How identified/nominated/recruited: peer volunteers were recruited during February and March 2006 via letters, advertisements in local newspapers and posters displayed at the local outpatient cardiac rehabilitation programme. Peer volunteers included men and women who had undergone...
CABG surgery within the previous 5 years, were able to communicate by telephone, and had attended a cardiac rehabilitation programme.

| Interventions | Intervention description: | "In addition to usual care, patients randomly assigned to the peer support group received peer-generated telephone calls for eight weeks following hospital discharge. Peer volunteers used the usual care materials to focus their telephone conversations on pain management, exercise, and encouragement to attend a cardiac rehabilitation program. The intervention was standardized in that peer volunteers participated in a 4 h training session to clarify and review content materials of usual care, develop skills required for effective telephone support, understand when and how to facilitate appropriate referrals to health professionals, and demonstrate learning through role-playing and strategizing exercises; support was initiated within 72 h of hospital discharge; and support continued for a period of eight weeks. Peer volunteers also received a training manual intended to guide the training sessions and the intervention. The manual was based on those used in other peer support programs. The dose and frequency of the calls were determined by the peer-patient dyad at each telephone interaction and all telephone calls were to be peer-initiated."

**Theoretical underpinning:** based off of Wilson & Cleary conceptual model of patient outcomes/quality of life

**Type of intervention:** social support only

**Components:** telephone calls

**Type of support:** emotional

**Support provided by:** peer volunteer

"The intervention was standardized in that peer volunteers participated in a 4h training session to clarify and review content materials of usual care, develop skills required for effective telephone support, understand when and how to facilitate appropriate referrals to health professionals, and demonstrate learning through role-playing and strategizing exercises; support was initiated within 72 h of hospital discharge; and support continued for a period of eight weeks. Peer volunteers also received a training manual intended to guide the training sessions and the intervention."

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** remote

**Time of start after event/diagnosis:** after discharge (within 72 hours)

'Intensity' (no. contacts/sessions + session/contact duration): variable.
The dose and frequency of the calls were determined by the peer-patient dyad at each telephone interaction and all telephone calls were to be peer-initiated.

**Total programme duration:** 8 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** patients allocated to the UC group received preoperative and postoperative education, and visits from in-hospital peer volunteers

**Co-interventions:** none

| Outcomes | Outcomes measured: | HRQoL, psychological well-being, social isolation and connectedness |

| Notes | **Trial funding:** | HSFC, Canadian Institutes of Health Research FUTURE Program for Cardiovascular Nurse Scientists, Cardiac Science Medtroni Research Grant/Kingston General Hospital, CCCN R- |
Parry 2009 (Continued)

search Grant, Nurse Practitioner Association of Ontario Cardiovascular Acute Care Nurse Practitioner Pfizer Award and a Canadian Pain Society Nursing Research Award

**Declarations of interest:** NR

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**Piette 2015**

**Study characteristics**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Study design: RCT (individual participant allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Number of centres:</strong> NR</td>
</tr>
<tr>
<td></td>
<td><strong>Country:</strong> USA</td>
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<tr>
<td></td>
<td><strong>Dates study conducted:</strong> June 2009 to January 2012</td>
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<tr>
<td></td>
<td><strong>Maximum follow-up:</strong> 12 months</td>
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<table>
<thead>
<tr>
<th>Participants</th>
<th><strong>Participants (patients)</strong></th>
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<tbody>
<tr>
<td></td>
<td><strong>Inclusion criteria:</strong> to be eligible, patients had to have an HF diagnosis, New York Heart Association classification of II or III, and a documented ejection fraction &lt; 40%. Patients also had to have attended at least one veterans' affairs (VA) outpatient visit within the previous 12 months, have a VA primary care provider, and be able to participate in automated telephone calls in English. Patients needed to nominate an eligible Care Partner, that is, a relative or friend living outside their home.</td>
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<tr>
<td></td>
<td><strong>Exclusion criteria:</strong> patients were excluded if they lived in a skilled nursing facility; were prescribed oxygen supplementation; were receiving palliative care; had a life-threatening condition such as lung cancer; or had ICD-9 code diagnosis indicating dementia, bipolar disorder, or schizophrenia.</td>
</tr>
<tr>
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<td><strong>N randomised:</strong> total: 372; intervention: 189; comparator: 183</td>
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<tr>
<td></td>
<td><strong>Diagnosis (% of participants):</strong> HF: 100%</td>
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<tr>
<td></td>
<td><strong>Age (mean ± SD):</strong> intervention: 67.6 ± 10.3; comparator: 68.1 ± 10.1</td>
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<tr>
<td></td>
<td><strong>Percentage male:</strong> intervention: 100%; comparator: 98.8%</td>
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<tr>
<td></td>
<td><strong>Ethnicity:</strong> White - intervention: 77.1%; comparator: 77%</td>
</tr>
<tr>
<td></td>
<td><strong>Socio-economic status (income, occupational class, education):</strong> High school or less: Intervention: 54.2% Comparator: 41.8% Unemployed/retired: Intervention: 89.2% Comparator: 86.1% Income &lt; USD $15,000: Intervention: 32.5% Comparator: 30.3%</td>
</tr>
</tbody>
</table>
Interventions

**How identified/nominated/recruited:** nominated by participant

**Intervention description:** "Patients, Care Partners, and in-home caregivers (when present) randomized to standard mHealth were mailed information about HF self-care. Patients received weekly IVR (interactive voice response calls) monitoring and self-management support calls for 12 months. Up to nine call attempts per week were made at times the patient indicated were convenient. IVR calls included recorded information and questions that patients answered using their touchtone keypad. The IVR calls were developed by a panel including primary care physicians, cardiologists, nurses, and experts in health behavior change and mHealth. Calls lasted roughly 10 minutes and followed a tree-structured algorithm to ask about overall health, HF symptoms, and self-management behaviors. Patients received pre-recorded information tailored to their reported symptoms and self-care practices. When patients reported an urgent issue via IVR (ie, worsening shortness of breath or a significant weight increase), the system automatically issued a fax notification to their clinician. A significant weight increase was defined as a 5-lb increase over 1 or 2 weeks, a 7-lb increase over 3 weeks, or an average gain of 2 lbs per week since the last automated call if more than 3 weeks had elapsed. Actions taken by clinicians based on the faxes were not tracked.

Patients and Care Partners randomized to mHealth+CP received identical intervention elements described above. mHealth+CP Care Partners were automatically emailed a structured report after each completed IVR call. Care Partner reports were sent to their personal, individual email addresses, which were stored in the system’s secure database at the University of Michigan. Reports described in lay language what patients’ responses meant in terms of risk for HF exacerbations and included suggestions for how Care Partners could support self-management. Email reports referred to the patient using gender-specific pronouns, for example, “Your partner did not weigh himself last week” but were otherwise de-identified. Reports included feedback about the patient’s most recent issues as reported during their IVR call, including shortness of breath, medication adherence, salt, and fluid intake, and increases in weight. Care Partners were asked to call their patient-partner weekly to review the reports and address identified problems. Care Partners received guidelines about how to communicate in a positive motivating way, avoid conflict by respecting boundaries, include in-home caregivers, and respect confidentiality. Patients received a notebook including reminders and tips for their weekly patient-Care Partner calls. Care Partners received logbooks for tracking IVR reports, upcoming patient contacts, clinical encounters, and medication refills”.

**Theoretical underpinning:** the mHealth+CP intervention was based on self-regulation theory, which emphasizes communication of expectations of behaviour ("standards"), promotion of motivation to meet standards, and monitoring with feedback regarding the gap between behaviour and standards

**Type of intervention:** multicomponent

**Components:** social support, IVR calls, monitoring

**Type of support:** appraisal

**Support provided by:** friend or relative not living in the home

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** remote (telephone)

**Time of start after event/diagnosis:** NR

**'Intensity' (no. contacts/sessions + session/contact duration):** weekly IVR calls for 12 months. Weekly phone calls with care partner to review reports generated from IVR calls.

**Total programme duration:** 12 months

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR

**Adherence/fidelity assessed:** NR
Co-interventions: none

Comparator description: "Patients, Care Partners, and in-home caregivers (when present) randomized to standard mHealth were mailed information about HF self-care. Patients received weekly IVR monitoring and self-management support calls for 12 months. Up to nine call attempts per week were made at times the patient indicated were convenient. IVR calls included recorded information and questions that patients answered using their touchtone keypad. The IVR calls were developed by a panel including primary care physicians, cardiologists, nurses, and experts in health behavior change and mHealth. Calls lasted roughly 10 minutes and followed a tree-structured algorithm to ask about overall health, HF symptoms, and self-management behaviors. Patients received pre-recorded information tailored to their reported symptoms and self-care practices. See Figures 1 and 2 for screenshots of the website used for enrollment and call scheduling. When patients reported an urgent issue via IVR (ie, worsening shortness of breath or a significant weight increase), the system automatically issued a fax notification to their clinician. A significant weight increase was defined as a 5-lb increase over 1 or 2 weeks, a 7-lb increase over 3 weeks, or an average gain of 2 lbs per week since the last automated call if more than 3 weeks had elapsed. Actions taken by clinicians based on the faxes were not tracked."

Co-interventions: none

Outcomes measured: HRQoL, social isolation and connectedness

Notes

Trial funding: the study was funded by VA Health Services Research and Development Program (HSR&D) grant #IIR 07-185. JP is a VA Senior Research Career Scientist. RT is a VA HSR&D Career Development Awardee. Additional financial support came from grant #P30DK092926 from the National Institute of Diabetes and Digestive and Kidney Diseases

Declarations of interest: none described

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 2

Country: USA

Dates study conducted: 1986 to 1992

Maximum follow-up: 5 years

Participants

Inclusion criteria: age 35 to 75 years, male or female; residence in the greater San Francisco area; no other life-threatening illnesses; no myocardial infarction during the preceding 6 weeks, and no history of receiving streptokinase or alteplase; not currently receiving lipid-lowering drugs; one, two, or three vessel coronary artery disease (defined as any measurable coronary atherosclerosis in a non-dilated or non-bypassed coronary artery); left ventricular ejection fraction greater than 25%; not scheduled to have coronary artery bypass grafting; and permission granted by patient’s cardiologist and primary care physician

Exclusion criteria: NR

N randomised: total: 48; intervention: 28; comparator: 20

Diagnosis (% of participants): coronary atherosclerosis: 100%

Age (mean ± SD): intervention: 57 ± 8; comparator: 59 ± 10
Interventions

Intervention description: "To acquaint patients with the lifestyle program, the treatment intervention began with a weeklong residential retreat at a local resort hotel. Patients' spouses or partners were invited to attend. During the retreat, patients and partners attended daily lectures on the rationale for the lifestyle intervention, nutrition lectures, cooking classes, and grocery store tours. Patients received 3 hr of stress management training, 1 hr of aerobic exercise, and 1 hr of group support meetings per day led by a clinical psychologist. Following the retreat, patients attended program sessions in groups two times per week for 1 year. Sessions focused on the four program components in 1-hr blocks. In addition, they were instructed to follow the diet, exercise, and practice stress management on their own. Thus, 104 sessions (4 hr each) were offered during the 1-year intervention. After 1 year of intensive lifestyle intervention, patients were given the option to continue the Ornish program lifestyle on their own in a self-directed community, which was not part of the research protocol. Patients paid for their own transportation and for potluck food they brought to the group meetings. Yoga instruction, group support, and the meeting space were paid for by the Preventive Medicine Research Institute. Five years after study entry, all patients were invited for systematic reassessment."

Sessions were led by a clinical psychologist who facilitated discussions of strategies for maintaining adherence to the programme, communication skills, and expression of feelings about relationships at work and at home

Theoretical underpinning: NR

Type of intervention: multicomponent

Components: exercise, diet, meetings

Type of support: emotional

Support provided by: spouse/partner or fellow participants

Setting: NR

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): 104 sessions, 4 hours each

Total programme duration: 1 year with option to continue to a community version

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: yes – engagement with lifestyle programme assessed using a lifestyle index
A lifestyle index, based on a formula validated in previous research, measured overall adherence to intervention guidelines and was calculated as the mean percentage of adherence to each lifestyle behaviour. Zero equaled no compliance, and 1 equaled 100% compliance. A score was created for each of the 4 elements, as well as a cumulative score for the entire programme adherence divided by the 4 elements: \[ \frac{t(\frac{u}{35v/420}2\frac{x}{3y/180})2z}{4}, \] where \( t \) is smoking compliance, \( u \) is stress management (times/week), \( v \) is also stress management (minutes/week), \( x \) is exercise (times/week), \( y \) is also exercise (minutes/week), and \( z \) is the dietary compliance score. Some of the patients did more than the recommended level and thus had a score greater than 100%.

Co-interventions: none

Comparator description: usual care

Co-interventions: none

Outcomes measured: all-cause mortality, myocardial infarction, psychological well-being, heart disease risk factors, physical activity, social isolation and connectedness, adverse events

Notes

Trial funding: "This study was supported by grants from the National Heart, Lung, and Blood Institute of the National Institutes of Health (ROI HL42554), the Department of Health Services of the State of California (no 1256SC-01), Gerald D. Hines Interests, Houston Endowment Inc, the Henry J. Kaiser Family Foundation, the John E. Fetzer Institute, Continental Airlines, the Enron Foundation, the Nathan Cummings Foundation, the Pritzker Foundation, the First Boston Corporation, Quaker Oats Co., Texas Commerce Bank, Corrine and David Gould, Pacific Presbyterian Medical Center Foundation, General Growth Companies, Arthur Andersen and Co., and others."

Declarations of interest: NR

**Powell 2008**

**Study characteristics**

Methods

Study design: RCT (individual participant allocation)

Number of centres: 1

Country: USA

Dates study conducted: October 2001 to October 2004

Maximum follow-up: 2 years

Participants

Participants (patients)

Inclusion criteria: eligible patients had HF for not less than the prior 3 months defined as either:

1. left ventricular ejection fraction ≤ 40% by echocardiography, radiographic ventriculography, or radionuclide ventriculography; or
2. diuretic therapy for at least 3 months and 1 previous hospitalisation for HF.

Exclusion criteria: exclusions were factors that would jeopardise the conduct or rigour of the trial. These included:

1. patients for whom the 12-month prognosis was uncertain (ie, New York Heart Association (NYHA) class IV, likelihood of cardiac transplant over the next year, symptomatic or sustained ventricular tachycardia not controlled by therapy within the last 3 months, or other illnesses or disorders that limit 12-month survival);
2. patients classified as NYHA Class I who were unlikely to have a primary endpoint over the course of the trial;
3. patients who were unlikely to undergo or benefit from the behavioural treatment (i.e. presence of cognitive dysfunction or psychological comorbidity such as substance abuse, psychotic disorder, or active suicidal ideation);
4. patients whose symptoms maybe eliminated by surgery (e.g. severe aortic stenosis);
5. logistical issues (e.g. patients were already enrolled in a conflicting protocol, patients were non–English speaking);
6. patients whose physicians refused access;
7. patients who indicated that they were unwilling to make lifestyle changes now or in the near future; and
8. patients who had unstable angina, myocardial infarction, coronary artery bypass grafting, or percutaneous transluminal coronary angiography within the last month (this was a temporary exclusion).

N randomised: total: 902; intervention: 451; comparator: 451

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 63.8 ± 13.7; comparator: 63.4 ± 13.3

Percentage male: intervention: 53.6%; comparator: 51.7%

Ethnicity: minority race/ethnicity: intervention: 39.2%; comparator: 41%

Socio-economic status (income, occupational class, education):
≤ High school education:
Intervention: 43.7%
Comparator: 43.7%

Participants (supporters - if available):
Relationship to patient: fellow patient. Optional to elicit support from friends and family.

Age (mean ± SD): see above

Sex (% male): see above

How identified/nominated/recruited: intervention participants

Interventions

Intervention description: “Self-management (SM) treatment featured group-based counselling to help patients develop mastery in problem-solving and in 5 SM skills deemed to be helpful in adhering to medical advice and alleviating any negative affect that would undermine adherence. Group, rather than individual, treatment was chosen because modeling by coping peers, and the resulting vicarious learning, has been shown to be a powerful agent of change. Eighteen 2-hour group meetings of 5 to 10 patients were spread out over the course of 1 year. At each group meeting, patients received HF education in the form of 18 one-page Heart Failure Tip Sheets from the American Heart Association, which summarized basic elements of HF management including medication adherence, sudden weight gain, salt restriction, moderate physical activity, and stress management. Implementation of these health education tips was accomplished through the mastery of 5 SM skills, chosen because of their relevance for the lifestyle changes required. These skills were (1) self-monitoring of such targets as weight and daily sodium intake; (2) environmental restructuring of the home and workplace by, for example, placing pill boxes in visible places to remind patients to take them; (3) social support where patients were encouraged to discuss efforts at making lifestyle changes with family and friends as a way to elicit their support; (4) cognitive restructuring where patients were taught to replace stress inducing thoughts with stress reducing ones; and (5) deep breathing as an immediate response to physical or emotional stress. To foster proactivity in invoking these skills when needed, a problem-solving format was used in which patients identified barriers to implementing the HF tips and were encouraged to use the SM skills to overcome them. All groups were led by health professionals with advanced degrees, with experience in conducting groups, and a willingness to follow a protocol. All prospective group leaders underwent standardized training over the course of 2 days.”

Theoretical underpinning: NR
Type of intervention: multicomponent
Components: education and counselling
Type of support: appraisal + emotional
Support provided by: fellow patients, optional to elicit support from friends and family
Setting: centre
One-to-one/group: group
Face-to-face/remote (telephone/online): face-to-face
Time of start after event/diagnosis: NR
'Intensity' (no. contacts/sessions + session/contact duration): 18 x 2-hour group meetings of 5 to 10 patients spread out over the course of 1 year
Total programme duration: 1 year
Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
Adherence/fidelity assessed: "All treatment sessions were taped, and randomly selected tapes were reviewed by the supervisor (K.J.F.) to check adherence to the protocol and provide feedback to the leader, as needed. Data reports focusing both on group leaders and individual patients were reviewed by an SM subcommittee to identify problems and strategies for their resolution. To prevent drift, group leaders met monthly to share successes and strategies for overcoming challenges. These meetings were conducted using the same format as that used in the SM groups for the purpose of modeling desired behaviors."
Co-interventions: none
Comparator description: patients randomised to the education control received a phone-based educational intervention that was believed to be the standard of care that would be in place when HART was concluded. Patients received the same 18 American Heart Association Heart Failure Tip Sheets, on the same schedule as the group meetings in the SM group. However, they were mailed to the home and, to insure receipt and check comprehension, a study co-ordinator placed a phone call within 2 to 3 days of receipt.
Co-interventions: none

Outcomes measured: all-cause mortality, all-cause hospitalisation, cardiovascular hospitalisation, HRQoL, psychological well-being, heart disease risk factors, social isolation and connectedness, adverse events

Notes
Trial funding: support for The HART study was provided by National Institutes of Health grant HL065547
Declarations of interest: Dr Calvin reported receiving re-search funding from Novartis, initiated after the conclusion of this trial. No other authors reported disclosures.
Participants

Participants (patients)

Inclusion criteria: diagnosis of heart failure: stage C chronic HF; confirmed by echocardiography and clinical evaluation; either HFrEF or HFrEF; 19 years of age or greater; able to speak and read English; telephone access in home; stable pharmacologic therapy per guidelines for past 30 days (i.e. stable doses of beta-blocker, ACEI or ARB, diuretic)

Exclusion criteria: clinical evidence of decompensated HF. Unstable angina pectoris; myocardial infarction, coronary artery bypass surgery, or biventricular pacemaker less than 6 weeks prior; orthopaedic or neuromuscular disorders preventing participation in aerobic exercise and strength/resistance training; participation in 3 times per week aerobic exercise during the previous 8 weeks. Cardiopulmonary stress test results that preclude safe exercise training; plans to move more than 50 miles from the exercise site within the next year; MVO2 in females > 21 mL/kg/min and in males > 24 mL/kg/min; Pregnancy - if participant is pregnant or plans to become pregnant during the study.

N randomised: total: 204; intervention: 102; comparator: 102

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): intervention: 59.8 ± 12.6 ; comparator: 60.9 ± 10.3

Percentage male: intervention: 55.9%; comparator: 54.9%

Ethnicity: 53.4% Caucasian

Socio-economic status (income, occupational class, education): NR

Participants (supporters - if available):

Relationship to patient: fellow participants

Age (mean ± SD): see above

Sex (% male): see above

How identified/nominated/recruited: see above

Interventions

Intervention description: all participants receive a cardiopulmonary exercise test and 9 supervised exercise training sessions during a 3-week run-in period prior to randomisation. Participants completing at least 6 of 9 training sessions are randomised to the HEART Camp Intervention group (HC) or a standard care (SC) exercise group. The HC intervention group receives cognitive-behavioural strategies that address the intervention components of knowledge, attitudes, self-efficacy, behavioural self-management skills and social support.

Phase 1 – adoption (baseline to 6 months) – weekly meeting with exercise coach + 6 weekly CAMP topics in group sessions (“Participants may invite a friend or family member to attend sessions with them.” Coach provides "continuous social support for exercise").

Phase 2 – transition (months 7 to 12) – weekly meeting with exercise coach + phone call from coach if relapse (“Group sessions are available weekly if participants wish to repeat sessions or interact in the group”).

Phase 3 – maintenance (months 13 to 18) - weekly reviews of exercise diaries by coach + phone call from coach if relapse.

Theoretical underpinning: based on cognitive-behavioural strategies

A multicomponent approach of group-based and individual-based intervention delivery, reported to be successful in changing physical activity behaviour. The model of future-oriented motiva-
Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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### Study characteristics

#### Methods

| Study design: RCT (individual participant allocation, 3 arms) |
| Number of centres: 1 |
| Country: USA |
| Dates study conducted: April 2014 to September 2015 |
| Maximum follow-up: 6 months |

#### Participants

<table>
<thead>
<tr>
<th>Participants (patients)</th>
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<tbody>
<tr>
<td>Inclusion criteria: included only patients between the ages of 30 and 75 with a diagnosis of coronary artery disease (CAD). They further limited this group to those who had documented poor adherence to a prescribed statin as measured by a 16-month medication possession ratio (MPR) of &lt; 80%.</td>
</tr>
<tr>
<td>Exclusion criteria: veterans whose problem list revealed active substance abuse, significant hearing loss, reduced cognitive ability, or homelessness were excluded</td>
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<tr>
<td>N randomised: total: 126; intervention: 54; individual feedback: 36 comparator: 36</td>
</tr>
<tr>
<td>Diagnosis (% of participants): coronary artery disease 100%</td>
</tr>
<tr>
<td>Age (mean ± SD): intervention: 64.9 ± 6.2; individual feedback: 65.6 ± 4.1; comparator: 64.1 ± 6.6</td>
</tr>
<tr>
<td>Percentage male: intervention: 96.3%; individual feedback: 100%; comparator: 91.7%</td>
</tr>
<tr>
<td>Ethnicity:</td>
</tr>
<tr>
<td>White, non-Hispanic – total: 45.2%, intervention: 37%, control: 47.2%, individual feedback: 55.6%</td>
</tr>
<tr>
<td>African American, non-Hispanic – total: 50.8%, intervention: 55.6%, control – 50%, individual feedback: 44.4%</td>
</tr>
<tr>
<td>Other – total: 4%, intervention: 7.4%, control: 2.8%, individual feedback: 0</td>
</tr>
<tr>
<td>Socio-economic status (income, occupational class, education): NR</td>
</tr>
</tbody>
</table>

| Participants (supporters - if available): |
| Relationship to patient: family member or friend (n = 47), peer (n = 7) |
| Age (mean ± SD): NR |
| Sex (% male): NR |

| How identified/nominated/recruited: |
| a patient randomised to this group chose a family member, friend, or another patient randomised to this group as a partner. We defined peer partner as a participant in the partner feedback group who chose to share their feedback with another patient. |

#### Interventions

| Intervention description: |
| "Each patient was given a GlowCap bottle (Vitality, Inc., Los Angeles, CA) to use for their statin. The bottle has a computer chip in the lid that communicates with a cellular-connected plug-in nightlight. When all features are activated, the GlowCap monitor changes color 1 h before the scheduled time to take the medication. If the medication is taken during this period, the pill bottle does not sound an alarm. If the medication is not taken within the designated period, the bottle flashes and sounds an alarm. All patients received educational material on the importance of adherence to statin medication. The GlowCap was used as an electronic monitoring device to measure our primary outcome. The control group received this device, but none of the patient features were activated (no alarm or notification). The use of the device in the control arm allowed us to accurately measure daily adherence and to compare this to the intervention (which included notification and alarm). The individual feedback participants received a bottle with a daily alarm and a weekly adherence feedback report. Weekly feedback reports (Appendix available online) displayed participants’ medication adherence and assigned a value for weekly..." |
performance based on the number of days that they had opened the bottle. For example, if a participant had taken his or her medication every day, the weekly report would display “Your weekly performance is great, keep it up.” If it demonstrated less adherence, the report would state “Your weekly performance needs improvement.” Participants in the partner feedback also had a copy of the report sent to their designated family member, friend, or peer. All participants and partners were trained on the interpretation of the weekly adherence report.

**Theoretical underpinning:** habit formation

**Type of intervention:** multicomponent

**Components:** tools, social support

**Type of support:** appraisal

**Support provided by:** friend, family member or peer

Participants in the partner feedback also had a copy of the report sent to their designated family member, friend, or peer. All participants and partners were trained on the interpretation of the weekly adherence report.

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** NR

**Time of start after event/diagnosis:** NR

**'Intensity' (no. contacts/sessions + session/contact duration):** weekly feedback report for individual feedback and peer support arms. Peer/partner support unspecified.

**Total programme duration:** 13 weeks

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** yes - primary outcome was medication adherence (daily opening of pill bottle) during the intervention period (13 weeks). Adherence was calculated as the number of days the GlowCap bottle was opened during the period divided by 91 (number of days in the time period).

**Co-interventions:** none

**Comparator description:** arm 1: usual care; arm 2: individual feedback (no social support)

**Co-interventions:** none

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: heart disease risk factors, social isolation and connectedness</th>
</tr>
</thead>
</table>

**Notes**

**Trial funding:** this work was supported by a grant from the Center for the Evaluation of Patient Aligned Care Teams at the Philadelphia VA

**Declarations of interest:** “Kevin Volpp is a principal at the behavioral economics consulting firm VAL Health and has received consulting income and research support from CVS Health, as well as research support from Humana, Weight Watchers, and the Vitality Institute (not related to Vitality, Inc., the manufacturer of the GlowCap pill bottle). Dr. Asch has also served as a consultant for VAL Health. All the other authors declare that they do not have a conflict of interest.”

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**Riegel 2004**

**Study characteristics**

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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### Methods

**Study design:** RCT (individual participant allocation)

**Number of centres:** 2

**Country:** USA

**Dates study conducted:** 1999 to 2001

**Maximum follow-up:** 3 months

### Participants

**Participants (patients)**

**Inclusion criteria:** people hospitalised for HF were enrolled as mentees if they were (1) diagnosed with HF by their physician, (2) cognitively intact, (3) possessed a telephone and the hearing ability to use it, (4) planning to be discharged to home, and (5) able to read and write English at a sixth-grade level or above

**Exclusion criteria:** NR

**N randomised:** total: 60; intervention: 31; comparator: 29

**Diagnosis (% of participants):** HF: 100%

**Age (mean ± SD):** intervention: 72.64 ± 13; comparator: 73.28 ± 13.09

**Percentage male:** intervention: 42.2%; comparator: 41.9%

**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):**

- Highest education achieved:
  - High school – total: 13.6%, control: 13.9%, intervention: 13.3%
  - Business school – total: 46.6%, control: 48.8%, intervention: 44.4%
  - Some college – total: 15.9%, control: 11.6%, intervention: 20%
  - Baccalaureate degree – total: 8%, control: 7%, intervention: 8.9%
  - Graduate school – total: 5.7%, control: 4.7%, intervention: 6.7%

- Income:
  - < USD $20,000 annually – total: 48.5%, control: 50.1%, intervention: 47.4%
  - $20,000 to $44,999 – total: 34.2%, control: 31.1%, intervention: 36.9%
  - > $45,000 – total: 17.1%, control: 18.8%, intervention: 15.8%

**Participants (supporters - if available):**

**Relationship to patient:** none - former HF patients

**Age (mean ± SD):** 73 ± 9.2

**Sex (% male):** 55.56%

**How identified/nominated/recruited:** "Mentors were identified primarily from our previous HF disease management studies. Likely candidates were called and asked if they would like to volunteer for this project. To be eligible to be a mentor, individuals diagnosed with HF by their physician had to be (1) cognitively intact, (2) possessing a telephone and the hearing ability to use it, (3) able to read and write English at a sixth grade level or above, and (4) available to attend the training. No other inclusion or exclusion criteria were used for the mentors."

### Interventions

**Intervention description:** "9 HF patients were recruited and trained as mentors in a series of 5 classes taught over a 2-week period by an experienced cardiovascular clinical nurse specialist. The mentors were elderly (mean age 73 ± 9.2 years, range 57 to 86 years). Five were men, 6 were widowed, 3 had at least some college education, and all were retired. Five had preserved left ventricular HF, 5 were NYHA class I patients, 2 were NYHA class II patients, and 2 were NYHA class III patients. Two of the 9 had moderate levels of comorbidity and the other 7 had primarily only HF. The
mentors may have been fairly socially isolated because half of them reported 2 or 3 support deficits (discussed under “instrumentation”). Class content addressed expectations of the mentoring role and self-care of HF. Attention was given to assuring that the mentors understood HF correctly so that misinformation provided by mentors to mentees was minimized. Specific HF self-care techniques included communicating with the physician and how to integrate the diet and medication regimen into one’s lifestyle. Mentors were taught to support their mentees rather than trying to assume the role of a healthcare provider. They were encouraged to model practical solutions to HF management, maintain boundaries, help mentees adhere to their treatment regimens, and decrease barriers to achieving self-care. Oversight of the intervention and continuing mentoring of the mentors by the clinical nurse specialist and the nurse research associate occurred throughout the course of the study. Monthly Peer Mentor Group meetings were conducted to provide an opportunity for sharing, problem-solving, and mutual support. Major problems with mentees identified by mentors were reported to the nurse research associate and handled directly by staff or referred to a local resource center (eg, ElderCare, Area Agency on Aging). Eligible mentees were enrolled during a hospitalization for HF. Once enrolled, a mentor of the desired gender and living in the general geographical location of the mentee was notified of the assignment by the nurse research associate. Each trained mentor was assigned to at least 1 mentee during the course of the trial; 60% of mentees were assigned to 3 of the mentors (2 women, 1 man). Contact usually began with a telephone call to the mentee once she/he was home from the hospital, although mentors visited some mentees during hospitalization. A mutually satisfying contact method and schedule was arranged during the first contact. Mentoring occurred during home visits, phone calls, joint outings (eg, lunch, HF support groups at the hospital, grocery shopping), demonstrations (eg, how to prepare a tasty poached egg without salt), and modelling. Mentors were asked to maintain weekly contact by telephone or visit with their mentees during the first month after hospital discharge and at least monthly thereafter for a period of 90 days. No specific number or frequency of contacts was mandated and mentee desire for contact drove the number of contacts received. If the mentee did not wish to be called, the mentor complied even though the protocol specified weekly contact during the first month. Intervention group patients (ie, mentees) received a median of 4 contacts (range 1–37) over the 3-month period.”

Theoretical underpinning: the theoretical basis for the peer mentoring or support intervention was social support. Many older people desire to continue living at home, even if alone, rather than relinquish their lifestyle, control, and independence.

Type of intervention: social support

Components: social support

Type of support: informational + instrumental + emotional

Support provided by: 9 HF patients were recruited and trained as mentors in a series of 5 classes taught over a 2-week period by an experienced cardiovascular clinical nurse specialist

Setting: home/community

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): face-to-face and remote (participant choice)

Time of start after event/diagnosis: NR

‘Intensity’ (no. contacts/sessions + session/contact duration): variable.

"Mentors were asked to maintain weekly contact by telephone or visit with their mentees during the first month after hospital discharge and at least monthly thereafter for a period of 90 days. No specific number or frequency of contacts was mandated and mentee desire for contact drove the number of contacts received. If the mentee did not wish to be called, the mentor complied even though the protocol specified weekly contact during the first month. Intervention group patients (ie, mentees) received a median of 4 contacts (range 1–37) over the 3-month period.”

Total programme duration: 3 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
Riegel 2004 (Continued)

Adherence/fidelity assessed: no

Co-interventions: none

Comparator description: usual care for the control group included in-patient education regarding HF. No formal disease management programme was in place at the time this trial was in progress, although monthly support groups for HF patients were available to all.

Co-interventions: none

Outcomes measured: all-cause hospitalisation, cardiovascular hospitalisation, physical activity, social isolation and connectedness

Notes

Trial funding: this study was funded by a grant-in-aid from the Western Affiliate, American Heart Association

Declarations of interest: NR

Shahriari 2013

Study characteristics

Methods

Study design: RCT (individual participant allocation)

Number of centres: 3

Country: Iran

Dates study conducted: 2012

Maximum follow-up: 1 month

Participants

Participants (patients)

Inclusion criteria: confirmation of heart failure diagnosis by a cardiologist, being in grade II, II, or IV of heart failure based on American Heart Association classification, having history of at least one time hospitalisation due to cardiac failure, at least 1 year of experience of heart failure, being over 21 years of age, complete consciousness, no history of myocardial infarction (MI) or heart surgery in the past 6 months, no history of other chronic or disabling diseases except cardiovascular risk factors (diabetes, hypertension, and hyperlipidaemia), having a family, not living alone and the caregiver being from the family members, being over 18 years of age, and being literate

Exclusion criteria: NR

N randomised: total: 64; intervention: 32; comparator: 32

Diagnosis (% of participants): HF: 100%

Age (mean ± SD): NR

Percentage male: intervention: 56.2%; comparator: 53.1%

Ethnicity: NR

Socio-economic status (income, occupational class, education):
Education level:
Illiterate – control: 56.2%, intervention: 46.9%
High school – control: 43.8%, intervention: 53.1%

Participants (supporters - if available):
Relationship to patient:
Husband – 28.1%
Children – 46.9%
Other: 25%

Age (mean ± SD): NR

Sex (% male): 21.9%

How identified/nominated/recruited: caregivers

Interventions

Intervention description: "The intervention program included three group educational sessions. As the subjects in the study group were from three medical centers, the patients’ caregivers in each center were considered as a control group and three sessions with 812 attendees were held for each group. These sessions were held weekly for 11.5 h in an appropriate classroom in the same medical educational center. In the first session, the caregivers were familiarized with the definition and heart failure disease process, its etiology and treatment, importance and manner of selfcare behaviors, and related skills such as reading food labels and taking strategies to lower food salt intake. At the end of the first session, a booklet of heart failure selfcare guidelines was distributed among the caregivers, not only to read but also to discuss the points with the other family members in order to be able to answer the questions related to the disease and administration of selfcare indicated at the end of the booklet, with the cooperation of the patients. They were also asked to write down their possible questions and deliver them to the researcher in the following session. In the second session, patients’ and caregivers’ responses to the questions in the booklet were collected and their learning and practical administration of the learned issues were evaluated, and the required guides were given to the caregivers. Then, the importance and role of family in disease control and patients’ care was explained. The caregivers held group discussions about living with heart failure patients and the way of supporting them. In order to increase emotional and affective support toward these patients, efficient communication skills were also explained. Case scenario, role play of suggested strategies, and supportive discussion were adopted to empower, and practice learned skills. At the end of the second session, the caregivers were given a booklet about the importance and manner of patients’ practical and emotional support, and they were asked to pass it among the other family members. In the third session, caregivers gave examples of the patient supportive strategies taken, and communication as well as prohibiting and facilitating factors they faced during the latest week. Then, some indications about the manner of selfcare as well as other related points were explained to finalize the subject and get a conclusion during the sessions. At the end of the third session, a contact number was given to the caregivers in order to get answers for their disease related and selfcare related questions. Phone call followups were carried out for 2 weeks to guide the subjects and answer their questions.”

Theoretical underpinning: NR

Type of intervention: multicomponent

Components: social support, education sessions, telephone

Type of support: informational + emotional

Support provided by: family or other

Setting: centre

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face (later telephone)

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): 3 sessions, 1 to 1.5 hours

Total programme duration: NR

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR
Shahriari 2013 (Continued)

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** usual care

**Co-interventions:** none

**Outcomes measured:** heart disease risk factors

**Notes**

**Trial funding:** Nursing and Midwifery Faculty, Isfahan University of Medical Sciences

**Declarations of interest:** none described

Sher 2002

**Study characteristics**

**Methods**

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** 2
- **Country:** USA
- **Dates study conducted:** NR
- **Maximum follow-up:** 18 months

**Participants**

**Participants (patients)**

- **Inclusion criteria:** patients were eligible for inclusion in the study if they were diagnosed with CAD or had a significant cardiac event or intervention (e.g. MI, CAGB, angioplasty); were married or living for at least 6 months with an intimate partner and their partner agreed to participate; were being treated with lipid-lowering medication; were able to participate in regular exercise; and needed to lose weight or implement a low fat diet

- **Exclusion criteria:** included uncontrolled medical conditions such as hypertension, congestive heart failure, diabetes, or thyroid disease; inability to read or speak English at a 6th grade level; extensive travel or residence elsewhere during the year of their participation in the study; psychiatric hospitalisation within the previous 12 months; and current treatment for drug or alcohol abuse

- **N randomised:** total: 80; intervention: 41; comparator: 39

- **Diagnosis (% of participants):** NR

- **Age (mean ± SD):** total: 60.16 ± 10.2

- **Percentage male:** total: 87.5%

- **Ethnicity:**
  - 65% Caucasian
  - 18.8% African American
  - 18.8% Hispanic
  - 6.2% Asian
  - 1.2% Unknown

- **Socio-economic status (income, occupational class, education):** NR

**Participants (supporters - if available):**

**Relationship to patient:** spouse or intimate partner
Age (mean ± SD): 56.87 ± 11.7  
Sex (% male): 18.3%  
How identified/nominated/recruited: spouse or intimate partner

### Interventions

**Intervention description:**

"Both conditions:

Groups included all participants assigned to that condition. Therefore, those assigned to the Couple condition were only in a group with others so assigned, and the same occurred for the individual groups. All groups (both conditions) met for 18 sessions (12 weekly sessions followed by 6 alternate week sessions over a total of 24 weeks). The groups followed a standard, manualized program. Information regarding nutrition, exercise, and medication adherence as they relate to heart disease were discussed. The groups consisted of a brief didactic presentation and questions and answers about the presentation, followed by either break-out dyadic sessions for the couples condition or a group discussion for the individuals condition. Health behaviour topics for both conditions included subjects such as nutrition guidance, exercise “do's and dont’s” and the value of taking medications as prescribed. The final six sessions for both conditions focused on maintenance and relapse prevention.

Couples condition:

The couples intervention groups consisted of up to five patients, their partners, and a therapist. For the couples, the educational component was interspersed with communication skills training, motivation discussions, and relationship issues. Break-out groups for the couples consisted of couple-level discussions of the day's topic as well as practice time for the communication skills being taught. Therapists in the couples condition served as a resource for the couples’ discussion, observing and making suggestions for the content of the discussion as well as the process. The relationship content in the couples intervention instructed and encouraged patients and their partners to collaborate on making behavioral and relationship changes. For example, they were encouraged to figure out the best way for the partner to help the patient exercise using the communication strategies designed to increase positive interaction behaviors and decrease negative interaction behaviors. The communication skills training used general illness and rehabilitation topics and involved two components: problem solving and emotional expressiveness training, in keeping with standard CBCT strategies."

**Theoretical underpinning:**

Cognitive behavioural couples therapy (CBCT)  
Social-determination theory  
Transtheoretical model

**Type of intervention:** multicomponent  
**Components:** social support, education  
**Type of support:** instrumental + emotional  
**Support provided by:** spouse or intimate partner  
**Setting:** hospital and home  
**One-to-one/group:** group sessions then one-to-one discussion with partner  
**Face-to-face/remote (telephone/online):** face-to-face  
**Time of start after event/diagnosis:** NR  
**'Intensity' (no. contacts/sessions + session/contact duration):** 18 sessions (12 weekly then 6 alternate week sessions over 24-week period)  
**Total programme duration:** 24 weeks  
**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR  
**Adherence/fidelity assessed:** "To evaluate whether the therapists presented session content as intended and per-formed well during sessions, an experienced clinical psychologist who was oth-
erwise uninvolved with the investigation received 25 hours of specific training on the fidelity adherence and quality coding system. She listened to entire therapy sessions and rated them on 12 items, including three adherence items (e.g., was unscheduled material included), nine specific quality ratings (e.g., was the therapist informative without being pressuring), and an overall rating of session quality, using a 1–7 rating scale for each item. Approximately 25% of the sessions (n=71) for each therapist in each treatment condition were selected randomly to be rated. Therapists were not given feedback regarding scores from the outside rater. The ratings indicated a high level of adherence and quality on each item. The average rating of overall session quality was 5.6 out of a possible 7. Average ratings on all other items ranged from 5.3 to 6.2. A 2 (treatment condition) X 3 (therapist) MANOVA across the 12 items revealed no significant differences in adherence and quality across the treatment conditions, F (12, 50)=1.08,p>.05, therapists, F(36, 146)=1.35,p>.05, or the interaction of the two, F(24, 98)=1.1,p>.05.

**Co-interventions:** none

**Comparator description:** "The individuals condition consisted of up to 10 patients and a therapist. No group contained less than 5 individuals. Group discussion focused on the didactic topic of the day as well as personal reflections related to the patients’ health, with the therapist again serving as a resource person. Thus, the couples-related components of the intervention (such as communication strategies, social support strategies, and general couples issues) were only presented to the couples conditions; the nutrition, exercise, and medication adherence components were the same in both conditions, as was the amount of sessions."

**Co-interventions:** none

### Outcomes

**Outcomes measured:** physical activity, social isolation and connectedness

### Notes

**Trial funding:** funded by the National Institutes of Health: Heart, Lung, and Blood Institute grant #SR01 HL62158-02

**Declarations of interest:** NR

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**Shojaefar 2020**

### Study characteristics

#### Methods

**Study design:** RCT (individual participant allocation)

**Number of centres:** 1

**Country:** Iran

**Dates study conducted:** 2018 to 2019

**Maximum follow-up:** 3 months

#### Participants

**Participants (patients)**

**Inclusion criteria:** the inclusion criteria for the patients were as follows:

- diagnosis of ACS by a cardiologist;
- age > 21 years;
- having access to a personal or family mobile phone; and
- being able to read, write, and speak Farsi.

In addition, the inclusion criteria for the patient’s family were as follows:

- having access to a third person who could read the text messages for them;
- being able to do daily activities;
• having access to a personal or family mobile phone; and
• being able to read, write, and speak Farsi.

Exclusion criteria: In contrast, the exclusion criteria included:
• change of mobile phone number and not informing the researcher;
• having a known mental, intellectual, or motor disability;
• having a physical or mental problem, resulting in disability at any stage of the research.

Also, the exclusion criteria for the patient’s family included disability at old age and inability to read and write in Farsi language

N randomised: total: 96; intervention: 46; comparator: 45

Diagnosis (% of participants): acute coronary syndrome: 100%

Age (mean ± SD): intervention: 55.98 ± 8.1; comparator: 56.89 ± 8.27

Percentage male: intervention: 60.9%; comparator: 60%

Ethnicity: NR

Socio-economic status (income, occupational class, education):
Education:
Diploma and lower – intervention: 58.7% (27), control: 53.3% (24)
Bachelor’s degree – intervention: 41.3% (29), control: 44.4% (20)
Master’s degree and above – intervention: 0, control: 2.2% (1)

Participants (supporters - if available):
Relationship to patient: family members

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: NR

Interventions

Intervention description: the intervention group received educational text and video messages according to the Walker’s Lifestyle Questionnaire dimensions

Timetable: content of text messages in the intervention group.
Days of the week/subject of messages sent:
Saturday: nutrition
Sunday: physical activity
Monday: stress management
Wednesday: interpersonal relationships
Thursday: self-realisation

Theoretical underpinning: the intervention group received educational text and video messages according to the Walker’s Lifestyle Questionnaire dimensions

Type of intervention: multicomponent

Components: educational texts and video messages, family support

Type of support: instrumental + emotional

Support provided by: family

Setting: NR

One-to-one/group: NR
Shojaefar 2020 (Continued)

**Methods**

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** 6 hospitals
- **Country:** Netherlands
- **Dates study conducted:** July 2004 to November 2005
- **Maximum follow-up:** 12 months

**Participants**

- **Inclusion criteria:** patients who visited the heart failure and/or cardiology outpatient clinics of the participating hospitals between July 2004 and November 2005 were eligible for the study if they (1) had been diagnosed with CHF based on a systolic dysfunction (left ventricular ejection fraction (LVEF) < 40%, New York Heart Association (NYHA) Class II–III) or a diastolic dysfunction (NYHA Class II–III), as diagnosed by the primary cardiologist according to CHF guidelines. Patients with a diastolic dysfunction were eligible after being admitted at least once to the hospital based on cardiac decompensation after CHF diagnosis. In addition, patients were eligible if they: (2) had had an established CHF diagnosis for at least 6 months at the start of the intervention period; (3) were able to understand, write and speak Dutch; and (4) were willing to give informed consent to participate in the study.
- **Exclusion criteria:** patients were excluded if they were participating in other studies
- **N randomised:** total: 317; intervention: 186; comparator: 131
- **Diagnosis (% of participants):** HF: 100%
- **Age (mean ± SD):** intervention: 66.6 ± 11; comparator: 66.8 ± 10.1
- **Percentage male:** intervention: 75.8%; comparator: 67.9%

**Outcomes**

- **Outcomes measured:** psychological well-being, physical activity, social isolation and connectedness

**Notes**

- **Trial funding:** Kerman University of Medical Sciences
- **Declarations of interest:** none described
**Ethnicity:** NR

**Socio-economic status (income, occupational class, education):**
Middle education level, N (%): intervention 119 (64.3%), control 90 (68.7%)

**Participants (supporters - if available):**

**Relationship to patient:** a peer leader (a patient with HF)

**Age (mean ± SD):** NR

**Sex (% male):** NR

**How identified/nominated/recruited:** NR

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**Interventions**

**Intervention description:** "The Chronic Disease Self-Management Programme (CDSMP) is a structured self-management programme which consists of six weekly group sessions of two and a half hours each. The programme incorporates four strategies to enhance self-efficacy expectancies: skills mastery, reinterpretation of symptoms, modelling and social persuasion. Skills mastery includes goal-setting and action-planning, which can be considered as core activities of the CDSMP since they take up 25–35% of each session. Reinterpreting symptoms comprises cognitive symptom management techniques and deals with relieving symptom problems. By modelling and social persuasion, either through group participants or leaders, patients in the class are expected to become motivated to change their behaviours and beliefs. During the first session, patients received the reference book Living a healthy life with chronic conditions. In our study, all CDSMP classes were led by a cardiac nurse specialist (‘professional leader’) and a patient with CHF (‘peer leader’), both trained in the CDSMP protocol, instead of two trained lay volunteers (who might or who might not be chronically ill). The peer leaders acted as role models for the other patients in the class. Cardiac nurse specialists were included to decrease the potential physical and emotional burden on the peer leaders, to ensure continuity of the programme and to facilitate implementation of the CDSMP in standard Dutch health care. All leaders (n = 18) were trained according to the CDSMP protocol prior to the intervention period."

**Theoretical underpinning:** the programme is based on Bandura’s self-efficacy theory, in which self-efficacy refers to the confidence to achieve certain behaviours or physiological states under specific condition

**Type of intervention:** multicomponent

**Components:** 6 weekly group sessions

**Type of support:** informational + appraisal

**Support provided by:** peer supported

“All leaders (n = 18) were trained according to the CDSMP protocol prior to the intervention period.”

A total of 12 professionals and 11 CHF patients received 4 days of training with the CDSMP protocol in the period April 2004 to November 2005. The leader training was provided by one of the researchers (author ES) and a CHF nurse specialist of the University Hospital Maastricht in the Netherlands. Both had been instructed as master trainers at Stanford University by Lorig and colleagues in March 2004. The nurse master trainer also conducted several classes in the intervention period.

**Setting:** hospital (secondary care)

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** NR
### Smeulders 2010 (Continued)

'| Intensity' (no. contacts/sessions + session/contact duration): | 6 weekly sessions of 2.5 hours each |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Total programme duration:</td>
<td>6 weeks</td>
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<td>Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:</td>
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<tr>
<td>Adherence/fidelity assessed:</td>
<td>NR</td>
</tr>
<tr>
<td>Co-interventions:</td>
<td>none</td>
</tr>
<tr>
<td>Comparator description:</td>
<td>usual care</td>
</tr>
<tr>
<td>Co-interventions:</td>
<td>none</td>
</tr>
</tbody>
</table>

| Outcomes measured:                                          | all-cause mortality, HRQoL, psychological well-being |

<table>
<thead>
<tr>
<th>Notes</th>
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<tbody>
<tr>
<td>Trial funding: this research was funded by the Netherlands Heart Foundation (2002B005) and the University Hospital Maastricht (PF 179)</td>
</tr>
<tr>
<td>Declarations of interest:</td>
</tr>
<tr>
<td>none described</td>
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### Srisuk 2017

**Study characteristics**

<table>
<thead>
<tr>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study design: RCT (individual participant allocation)</td>
</tr>
<tr>
<td>Number of centres:</td>
</tr>
<tr>
<td>Country: Thailand</td>
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<tr>
<td>Dates study conducted:</td>
</tr>
<tr>
<td>Maximum follow-up:</td>
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<table>
<thead>
<tr>
<th>Participants (patients)</th>
</tr>
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<tbody>
<tr>
<td>Inclusion criteria:</td>
</tr>
<tr>
<td>1) Aged 20 years or over</td>
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<tr>
<td>2) A primary diagnosis of HF with New York Heart Association (NYHA) functional class I to III as confirmed by the treating doctor and/or patient history (Hoet al 1993) and where possible, objective evidence of cardiac dysfunction on an echocardiogram</td>
</tr>
<tr>
<td>3) Residing with at least one family member</td>
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<tr>
<td>4) Being contactable by telephone at home</td>
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<tr>
<td>5) Having a DVD player at home</td>
</tr>
<tr>
<td>Exclusion criteria:</td>
</tr>
<tr>
<td>N randomised: total:</td>
</tr>
<tr>
<td>Diagnosis (% of participants):</td>
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<tr>
<td>Age (mean ± SD):</td>
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<td>Percentage male:</td>
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<td>Ethnicity:</td>
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<tr>
<td>Socio-economic status (income, occupational class, education):</td>
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<tr>
<td>Education:</td>
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<tr>
<td>Uneducated – intervention:</td>
</tr>
</tbody>
</table>

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Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review) © 2023 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.
Primary school – intervention: 14%, control: 24%
Secondary school – intervention: 8%, control: 11%
Diploma – intervention: 2%, control: 5%
Bachelor – intervention: 0, control: 2%

Participants (supporters - if available):

Relationship to patient:
Spouse: 12%, control: 15%
Daughter or son: 21%, control: 18%
Sibling: 16%, control: 10%
Parent: 1%, control: 7%

Age (mean ± SD):
Intervention: 39 ± 10
Control: 43 ± 11

Sex (% male):
Intervention: 32%
Control: 22%

How identified/nominated/recruited: informal carer identified/nominated by patient

Interventions

**Intervention description:** Family-based education programme.

"The family-based education programme was designed as a 6-month programme comprising one face-to-face education counselling session, provision of a heart failure manual and DVD and telephone follow-up. The education session was conducted in the hospital outpatient clinic teaching room and lasted 40–60 minutes. The nurse who led the session was trained by the researcher and assessed to be competent prior to implementing the education. At the end of the session, dyads received instructions about using the education manual and DVD. In addition, scripted telephone calls were delivered for 15 minutes per week in the first month, per fortnight in the second month and once a month in the third to sixth months. The principal investigator and research assistant who delivered the intervention used the teach-back method with each telephone call and gave each dyad the opportunity to ask questions. Teach-back has been found to be an effective method for evaluating patient comprehension of educational efforts and assimilation of self-care behaviours. The education materials provided to each dyad were developed by the researcher and guided by adult learning theory principles and studies that had investigated the individual learning needs of HF patients, especially in Asia. Content was developed from relevant HF media and websites endorsed in Australia and adapted for cultural relevance using pictures and text that reflected the Thai cultural and linguistic context. Both the HF manual and DVD had been translated into the Thai language at a level equivalent to schooling at primary level only. The manual and DVD were checked by HF experts in Australia and verified for content and cultural validity by a panel of HF experts (cardiologist and HF nurses) in Thailand. The manual and DVD had been tested for readability and comprehensibility by three patients with HF and carer dyads who reported both resources to be helpful for gaining knowledge and self-care skills as well as providing assistance for coping with HF. A sample of HF patients was also given the opportunity to review and their comments, with regard to formatting of text, were also included. The manual contained nine chapters that explained key aspects of learning to live with HF and included pictures and health records as well as text. The DVD contained matched content. The HF manual was divided into easily recognizable, colour-coded chapters that corresponded to the nine DVD chapters. Patients and carers were asked to read each manual chapter after having watched the corresponding DVD chapter and also to help each other complete the reflective questions and activities. The manual and DVD incorporated skill building by providing the patient with a variety of activities such as self-appraisal, role-modelling, teaching problem-solving and learning self-monitoring skills."

"The DVD contains nine chapters that explain key aspects in learning to live with and adjust to HF. Chapter headings are: 1) What is HF?; 2) How does HF make you feel?; 3) When you feel sick what should you do?; 4) How can you make your heart feel better?; 5) Your medicine; 6) Your health record; 7) Your HF action plan; 8) Tips for your family and friends; and 9) Conclusion. The DVD was developed in an easy and simple mode for patients and carers to readily absorb the information, using pictures that reflect the Thai cultural context. At the end of each chapter, a reflective question is asked to encourage the patient and their carer to interact and discuss openly potential is-
sues (e.g. which of the symptoms is the hardest for me to manage?). The written manual is based on the DVD chapters and combines information for both patient and their carers. The manual contains more detail than the DVD, including written material, pictures and health record forms. The HF manual is divided into easily recognisable, colour-coded chapters that correspond to the nine DVD chapters. Both patient and carer will be asked to read each chapter within the manual and also help each other to complete the reflective questions or activities at the end of each section.”

Theoretical underpinning: “The education materials provided to each dyad were developed by the researcher and guided by adult learning theory principles and studies that had investigated the individual learning needs of HF patients, especially in Asia.”

Type of intervention: multicomponent
Components: counselling, education (manual and DVD), telephone support
Type of support: informational + instrumental + appraisal + emotional
Support provided by: family
Setting: one counselling session in primary care (hospital), remainder from home
One-to-one/group: counselling session = group, remainder = one-to-one
Face-to-face/remote (telephone/online): face-to-face and telephone support from research staff

Time of start after event/diagnosis:
Duration of HF at baseline (months):
Intervention: 22 ± 19
Control: 23 ± 18

'Intensity' (no. contacts/sessions + session/contact duration):
1 counselling session: 40 to 60 minutes
Telephone calls: 15 minutes, 1 per week in 1st month, 1 per fortnight in 2nd month, 1 per month in months 3 to 6

Total programme duration: 6 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: NR

Co-interventions: none

Comparator description: the usual care group received standard medical and nursing care from the hospital, including physical and biomedical examinations at outpatient clinics and general medical advice (usually a brief discussion on current health status). To reduce the potential of patient contact acting as a confounding variable, this group received equivalent contact with research personnel to the education group; this involved general health discussion and was not HF-specific

Co-interventions: none

Outcomes measured: all-cause mortality, HRQoL

Notes

Trial funding: NS was supported by a scholarship from Suratthani Rajab-hat University. JC, CFS and DRT are supported by a Collaborative Research Network grant from the Australian Government Department of Education

Declarations of interest: none described
### Study characteristics

#### Methods

<table>
<thead>
<tr>
<th>Study design</th>
<th>RCT (individual participant allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centres</td>
<td>1</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td>Dates study conducted</td>
<td>NR</td>
</tr>
<tr>
<td>Maximum follow-up</td>
<td>12 months</td>
</tr>
</tbody>
</table>

#### Participants

**Participants (patients)**

- **Inclusion criteria**: eligibility requirements included being a postmenopausal female and having documented CHD defined as atherosclerosis, MI, percutaneous transluminal coronary angioplasty, and/or coronary bypass graft surgery
- **Exclusion criteria**: having other life-threatening illnesses, infarction during the preceding 6 weeks, receiving streptokinase or alteplase, or being scheduled for bypass surgery
- **N randomised**: total: 28; intervention: 16; comparator: 12
- **Diagnosis (% of participants):**
  - MI: 46.4%
  - CABG: 25%
  - PCI: 32%
- **Age (mean ± SD)**: intervention: 64 ± 9; comparator: 62 ± 11
- **Percentage male**: 0%
- **Ethnicity**:
  - White (non-Latino): intervention n = 13, control n = 10
  - Latino: intervention n = 0, control n = 0
  - Native American or Alaskan: intervention n = 1, control n = 0
- **Socio-economic status (income, occupational class, education)**:
  - Level of education achieved:
    - 7th to 11th grade: intervention = 0, control = 2
    - High school graduate: intervention = 4, control = 3
    - Partial college: intervention = 7, control = 5
    - College/university graduate: intervention = 3, control = 1
- **Participants (supporters - if available):**
  - **Relationship to patient**: spouse or support partner chosen by participant
- **Age (mean ± SD)**: NR
- **Sex (% male)**: NR
- **How identified/nominated/recruited**: NR

#### Interventions

**Intervention description**: PrimeTime Intervention
"Participants randomized to the PrimeTime program began the intervention with a 7-day retreat. Each woman was encouraged to bring her spouse or a support partner who had agreed to assist her in carrying out the program. The daily schedule for the retreat included cooking classes, and meals were planned by the project dietician to follow the Reversal Diet guidelines (e.g. vegetarian, less than 10% calories from fat). Study participants received instruction in, and had an opportunity to practice, stress-management techniques twice per day during the retreat led by a certified Yoga instructor. The stress management techniques included Hatha Yoga stretches, progressive deep relaxation, deep breathing, meditation, and directed or receptive imagery (i.e. visualizing improvements occurring in the heart). The women were asked to practice these techniques 1 hour per day and were given audiocassette tapes to assist them. Daily group physical activity sessions included warm-up, walking or aerobics, and a cool-down led by an American College of Sports Medicine certified exercise physiologist. Participants were individually prescribed exercise intensity based on their treadmill exercise test performance. Following the retreat, the intervention exercise program required participants to engage in a 1-hour session per day at least 3 days each week. Retreat evenings ended with small, relatively unstructured group sessions for sharing feelings. Participants discussed difficulties with program components and emotional issues as they arose, practiced communication skills, and engaged in exercises to build group support and decrease feelings of social isolation. Group leaders emphasized unconditional positive regard and encouraged participants to share feelings rather than thoughts and to refrain from offering advice.

Twice-weekly 4-hour meetings followed the retreat. Each meeting followed a sequence similar to the retreat schedule: (a) supervised exercise training, (b) Yoga and relaxation led by a trained instructor, (c) one prepared meal and one potluck per week and (d) small group discussions similar to those held during the retreat.

PrimeTime participants were instructed to adhere to the Reversal Diet, which contains no animal products other than egg whites and nonfat yogurt and no added oils or other concentrated fats. The high-fiber diet contains less than 10% of calories from fat, 70% to 75% of calories from carbohydrates, 15% to 20% of calories from protein, and 5 milligrams of cholesterol per day.

After 15 months, the twice-weekly group meetings were reduced to 2-week intervals for 6 months, then reduced to once per month for the final 3 months."

Theoretical underpinning: NR

Type of intervention: multicomponent

Components: 7-day retreat with partners invited along. Included: cooking classes, stress management techniques, daily physical activity sessions, small group discussions

Type of support: emotional

Support provided by: NR

Setting: centre

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): 7-day retreat followed by twice-weekly 4-hour meetings for 15 months – followed by twice-weekly meetings every fortnight for 6 months – followed by 1 per month for 3 months

Total programme duration: 24 months

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: a smoking cessation component was designed for the one smoker in the intervention group

Adherence/fidelity assessed: measures of adherence to targeted lifestyle behaviours, including: diet, exercise, stress management, and smoking cessation
### Toobert 1998 (Continued)

| Co-interventions: | none |
| Comparator description: | usual care |
| Co-interventions: | none |

#### Outcomes

| Outcomes measured: | HRQoL, psychological well-being, social isolation and connectedness |

#### Notes

- **Trial funding:** the work reported here was supported by grant R29 HL50181 from the National Heart, Lung and Blood Institute of the National Institutes of Health, Maryland
- **Declarations of interest:** NR

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### Turner 2014

#### Study characteristics

| Methods | Study design: RCT (sub analysis, individual participant allocation) |
|         | Number of centres: NR |
|         | Country: Australia |
|         | Dates study conducted: March 2007 to November 2008 |
|         | Maximum follow-up: 12 months |

<table>
<thead>
<tr>
<th>Participants (patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inclusion criteria:</strong> eligible patients were consecutively admitted to 2 major university teaching hospitals between March 2007 and November 2008 after AMI, or for coronary artery bypass graft surgery (CABG) or percutaneous coronary intervention (PCI). Other eligibility criteria were: aged 75 years or less; residing in metropolitan Melbourne; and having an adequate command of English.</td>
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<tr>
<td><strong>Exclusion criteria:</strong> serious physical or psychiatric illness/disability, anticipated transport difficulties, non-availability for follow-up, and refusal</td>
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<tr>
<td><strong>N randomised:</strong> total: 275 (for sub study 42); intervention: 139 (for sub study 21); comparator: 136 (for sub study 21)</td>
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<tr>
<td><strong>Diagnosis (% of participants):</strong></td>
</tr>
<tr>
<td>CABG: intervention: 52.4%; control: 23.8%</td>
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<tr>
<td>PCI: intervention: 47.6%; control: 76.2%</td>
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<tr>
<td><strong>Age (mean ± SD):</strong> intervention: 55.6 ± 8.8; comparator: 57 ± 11.2</td>
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<tr>
<td><strong>Percentage male:</strong> intervention: 85.7%; comparator: 71.4%</td>
</tr>
<tr>
<td><strong>Ethnicity:</strong> NR</td>
</tr>
<tr>
<td><strong>Socio-economic status (income, occupational class, education):</strong> NR</td>
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<tr>
<td><strong>Participants (supporters - if available):</strong></td>
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<tr>
<td><strong>Relationship to patient:</strong> fellow participants</td>
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<tr>
<td><strong>Age (mean ± SD):</strong> see above</td>
</tr>
<tr>
<td><strong>Sex (% male):</strong> see above</td>
</tr>
</tbody>
</table>
### Interventions

**Intervention description:** 'Beating Heart Problems' is an 8-week group programme. Eight modules cover key areas of physical activity, diet, medication adherence, smoking cessation, depression, anxiety, anger, and social support. Sessions were facilitated by experienced psychologists who followed manualised guidelines. Participants received weekly handouts from a group workbook. The intervention was conducted as a rolling group, with participants joining the group the week after randomisation. A maximum of nine participants was present in a group at any time.

**Theoretical underpinning:** NR

**Type of intervention:** multicomponent (education and social support)

**Components:** group meeting, education materials

**Type of support:** unclear

**Support provided by:** peers

**Setting:** centre

**One-to-one/group:** group

**Face-to-face/remote (telephone/online):** face-to-face

**Time of start after event/diagnosis:** 6 weeks post discharge

**'Intensity' (no. contacts/sessions + session/contact duration):** NR

**Total programme duration:** 8 weeks

**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** usual care

**Co-interventions:** none

### Outcomes

**Outcomes measured:** psychological well-being, heart disease risk factors, physical activity, social isolation and connectedness

### Notes

**Trial funding:** this work was supported by Australian Rotary Health and the Norman H Johns Trust

**Declarations of interest:** none described

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### Study characteristics

**Methods**

**Study design:** RCT (individual participant allocation)

**Number of centres:** 1

**Country:** Iran

**Dates study conducted:** June 2012 to January 2015

**Maximum follow-up:** 24 months
Participants (patients)

Inclusion criteria: (1) age 45 to 85 years, (2) able and willing to provide informed consent, (3) willingness of designated family member or friend to participate, (4) is able to read, write, and fill out the questionnaire, (5) diagnosed with an AMI and (6) first hospitalisation for AMI. MI was diagnosed in accordance with established criteria including (1) clinical symptoms, (2) serum tests (e.g. troponin and creatine kinase (CK)-MB) and (3) characteristic changes on the ECG. Cardiac catheterisation data were not routinely available. Patients had not previously gone through CR programmes.

Exclusion criteria: NR

N randomised: total: 70; intervention: 35; comparator: 35

Diagnosis (% of participants): MI: 100%

Age (mean ± SD): intervention: 62 ± 14.18; comparator: 60.8 ± 11.51

Percentage male: intervention: 62.9%; comparator: 68.6%

Ethnicity: NR

Socio-economic status (income, occupational class, education):

Job:
- Clerk – total: 17.1%, intervention: 11.4%, control: 22.9%
- Labourer - total: 11.4%, intervention: 11.4%, control: 11.4%
- Housekeeper - total: 32.9%, intervention: 37.1%, control: 28.6%
- Unemployed - total: 4.3%, intervention: 2.9%, control: 5.7%
- Retired - total: 15.7%, intervention: 14.3%, control: 17.1%
- Non-governmental - total: 18.6%, intervention: 22.9%, control: 14.3%

Education level:
- Primary - total: 27.1%, intervention: 22.9%, control: 31.4%
- Secondary - total: 42.9%, intervention: 48.9%, control: 37.1%
- High/undergraduate - total: 30%, intervention: 28.6%, control: 31.4%

Participation (supporters - if available):

Relationship to patient: family member or friend

Age (mean ± SD): NR

Sex (% male): NR

How identified/nominated/recruited: NR

Interventions

Intervention description:

"Preintervention:
During the preintervention phase, patients filled out questionnaires concerning quality of life, perceived stress and anxiety. A rehabilitation plan was formulated incorporating considerations for the patient’s identified strengths and weaknesses.

Intervention:
Once discharged, patients called their study nurse every 2 days to report any problems or complications. Patients were evaluated by their primary cardiologist on a weekly basis and at 30 days. These examinations included history and physical examination, an ECG, and echocardiogram and laboratory tests as indicated. At other times, if patients experienced a problem or complication, they notified investigators and presented to either their primary cardiologist or their primary care provider for evaluation. Patients in the intervention group received care employing the FCEM in four stages. Stage 1 of the intervention was awareness and cognition. The patient was evaluated for their insight into their perceived illness severity and perceived sensitivity, or the degree to which they felt threatened by their illness. This was performed by means of 3–5 group sessions in the preintervention phase. Group sessions included 3–5 patients and lasted for 45–60 min each. Session content included assessments of the participants’ psychological and physical conditions.
as well as their attitude towards the nature, definition, risk factors, symptoms, medical and nursing care, and complications resulting from the MI.

In stage 2, patients were assessed for their expectations over 3–5 h sessions. Groups of 3–4 patients shared and learnt from each other under the moderation and guidance of the principal researcher.

In stage 3, the degree of patient acceptance was assessed using an educational participation method in group discussion. Patients reached practical solutions through using the problem-solving findings of the previous stage.

Stage 4 consisted of formative and summative evaluations. The aim of the formative evaluation was to encourage patients to internalise their locus of control by seeing his/her self-empowerment (increasing self-responsibility about their health).

Postintervention follow-up:
Phase 3 began 90 days following preintervention (control group), and 90 days postintervention (FCEM group). To assess the durability and stability of patient empowerment, patient knowledge, attitude and practice (KAP) was assessed over eight follow-up sessions at 3-month intervals. During the 24-month follow-up period, patients attended a total of 21 support-group webinars addressing topics including returning to work, intimate relationships, nutrition, sleep hygiene, tobacco use, exercise, and leisure activities and testing or laboratory issues.

Role of the designee:
Following informed consent, the designated family member or friend (hereafter called designee) continued through the study with the patient as a ‘unit’. The designee attended the patient’s educational sessions during stages 3 and 4, with stage 2 being according to the family member preference. Recall that stage 2 deals with patient expectations, stage 3 with patient acceptance and problem-solving, and stage 4 with evaluations and internalising his/her locus of control. The designee and the patient attended the same sessions and studied the same learning materials. Up to four family members were allowed to join in the educational sessions if requested. In stage 3, the designee was charged with learning and reinforcing educational material with the patient. In stage 4, when instructed by study investigators, the designee would administer the KAP assessments to the patient. In addition to scores, the designee would provide additional information on the patient’s home situation and current condition.

All patients had similar inpatient rehabilitation programmes. For patients in the FCEM group, outpatients included daily exercise for 0–2 h/day. Exercise occurred between 8:00 and 10:00, and types included walking, jogging, bicycle, swimming, or other exercise according to patient preference or resource availability. Daily exercise was supervised by designated family members. Investigators randomly attended sessions in an unannounced fashion. Although not routinely involved, physical therapy consultation was available on investigator request. Exercise data were independently collected from the patient and their designated family member on a weekly basis (κ statistic = 0.9). To measure the patients’ ‘walking distance, investigators provided them with a Fitbit.”

Theoretical underpinning: the Family-Centered Empowerment Model (FCEM) was designed and first reported by Dr Fatemah Ahlani at Tarbiat Modarres University. Its aim was to improve the care and outcomes of patients with chronic diseases and has previously been evaluated and validated in a number of chronic disease states. The primary aim of the model is to empower the patient/family unit to promote health quality. The model has 4 stages: (1) determining perceived threat (group discussion method); (2) self-efficacy (problem-solving method); (3) improving self-esteem (educational participation method) and (4) process and outcome evaluations.

Type of intervention: multicomponent

Components: group meetings, education, family support, exercise

Type of support: informational + instrumental + emotional

Support provided by: group session with 3 to 5 fellow patients and attend these sessions with family members or friends (may take more than one)

Setting: NR

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face
Vahedian-Azim 2016 (Continued)

**Time of start after event/diagnosis:** NR

**Intensity** (no. contacts/sessions + session/contact duration):
Stage 1: 3 to 5 group sessions lasting 45 to 60 minutes
Stage 2: 3 to 5 group sessions lasting for 1 hour
Stage 3: NR

During the 24-month follow-up period, patients attended a total of 21 support group webinars addressing topics including returning to work, intimate relationships, nutrition, sleep hygiene, tobacco use, exercise, and leisure activities and testing or laboratory issue.

**Total programme duration:** 24 months

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** patients in the control group received the same education and printed materials during their inpatient course. Routine care included education on smoking cessation and education on food selection. Patients were provided printed materials, with dietician assessments available on request.

**Co-interventions:** none

### Outcomes

**Outcomes measured:** all-cause mortality, myocardial infarction, revascularisation, HRQoL, psychological well-being, social isolation and connectedness

### Notes

**Trial funding:** "This research was supported financially by internal funding from the Trauma Research Center of Baqiyatallah University of Medical Sciences, the Nursing Department of Tarbiat Modares University, and the Loghman Clinical Research Development Center, Shahid Beheshti University of Medical Sciences (#340/5/5904)."

**Declarations of interest:** none described

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**Vellone 2020**

### Study characteristics

**Methods**

**Study design:** RCT (individual participant allocation; 3-arm - arm 1 not eligible for inclusion in this review)

**Number of centres:** 3

**Country:** Italy

**Dates study conducted:** June 2014 to October 2018

**Maximum follow-up:** 12 months

**Participants**

**Participants (patients)**

**Inclusion criteria:** patients were eligible if they (1) had a diagnosis of HF1 classified as New York Heart Association (NYHA) Class II–IV; (2) had evidence of insufficient self-care determined with a score of 0, 1, or 2 on at least 2 items of the self-care maintenance or self-care management scales of the Self-Care of HF Index v.6.2 (SCHFI v.6.2); and (3) were willing to sign the informed consent form

**Exclusion criteria:** patients who had a myocardial infarction during the last 3 months, had severe cognitive dysfunction with a score between 0 and 4 on the 6-item screener, lived in a residential facility where self-care was not expected, or had an informal caregiver who was not willing to participate in the study
N randomised: total: 510 (patient and caregiver dyads); intervention arm 1: 155; intervention arm 2: 177; comparator: 178

Diagnosis (% of participants): HF: 100%

Age (median, IQR): intervention arm 1: 74, 65 to 82; intervention arm 2: 73, 64 to 81; comparator: 75, 64 to 83

Percentage male: intervention arm 1: 51.6%; intervention arm 2: 60.5%; comparator: 61.2%

Ethnicity: NR

Socio-economic status (income, occupational class, education):
Education (high schools or higher) n, %:
Arm 1: patient: 41, 26.4
Arm 2: patient: 44, 24.8
Comparator: patient: 47, 26.4

Income (patients only) n, %:
Not the necessary to live:
Arm 1: 7, 4.5
Arm 2: 7, 4.0
Comparator: 8, 4.5

The necessary to live:
Arm 1: 131, 84.5
Arm 2: 138, 78.0
Comparator: 141, 79.2

More than the necessary to live:
Arm 1: 17, 11.0
Arm 2: 32, 18.1
Comparator: 29, 16.3

Participants (supporters - if available):
Relationship to patient: informal caregivers

Age (median): 55

Sex (% male): 75.5

How identified/nominated/recruited: designated by patients as primary caregiver

Interventions

Intervention description: "Motivational Interviewing (MI) will be delivered by registered nurses who have attended a 40-hour course on MI. This intervention will be performed in arm 1 to only patients and in arm 2, to both patients and caregivers. The intervention will include a first session (about 60 min) where the interventionist will address one or two aspects of self-care that the participants want to address. Guided by the principles of MI, the interventionist will develop discrepancy (e.g., helping the patient/caregiver to see that current behaviors would impede the ability to reach health goals), express empathy (e.g., with active listening and an attitude of acceptance), avoid arguing and direct confrontation (e.g., being respectful of patient/caregiver choices or preferences), roll with resistance (e.g., by involving patient and caregiver in problem solving) and support self-efficacy and optimism (e.g., by verbal persuasion and encouraging a focus on past successes). After this first intervention, the same interventionist will contact the participant by telephone to bolster the first intervention and provide further support as needed. These telephone contacts will be done three times at two weeks intervals following the first intervention (for a total of two months). Patients and caregivers that receive the intervention also will be given informational material on HF management that is consistent with international guidelines.

The same standard care was also provided to patients and caregivers in Arms 1 and 2. All participants in the three arms received informational material focused on HF self-care."
**Theoretical underpinning:** principles of motivational interviews: "motivational interviewing (MI) is a counselling technique defined as a “person-centered method of guiding to elicit and strengthen personal motivation for change” with a collaborative and evocative approach that honours patient autonomy to elicit his/her own motivation to change behaviours in the interest of health. In fact, MI is described as the polar-opposite of giving unsolicited advice. MI explores and resolves the ambivalence in individuals’ behaviors (e.g., someone who considers exercise to be important but does not exercise), thereby enhancing intrinsic motivation to change. MI is based on the following principles: develop discrepancy, express empathy, avoid arguing and direct confrontation, roll with resistance, and support self-efficacy and optimism."

**Type of intervention:** multicomponent

**Components:** motivational interview and informational material on HF management

**Type of support:** informational + appraisal + emotional

**Support provided by:** caregivers

**Setting:** centre-based

**One-to-one/group:** arm 2 - patient and caregiver

**Face-to-face/remote (telephone/online):** face-to-face and telephone

**Time of start after event/diagnosis:** NR

'Intensity' (no. contacts/sessions + session/contact duration): the intervention consisted of a face-to-face MI intervention (about 60 minutes in length) followed by 3 telephone contacts (within 2 months from enrolment)

**Total programme duration:** 2 months

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: "during MI, the interventionist will address one or two aspects of self-care that the participants want to address"

**Adherence/fidelity assessed:** "Treatment fidelity of the intervention (Arms 1 and 2) was evaluated at two levels. At the first level, we evaluated MI with the Motivational Interviewing Treatment Integrity (MITI) Scale. The MITI is a behavioural coding system that evaluates the technical and relational components of MI using a score from 1 to 5, with a higher score indicating better MI quality. An ideal technical quality score is ≥3, and an ideal relational component score is ≥4. For this assessment, we evaluated 48 randomly selected audiotapes of Arm 1 and 97 audiotapes of Arm 2 (50 patient audiotapes and 47 caregiver audiotapes). The mean score for the technical component of all analysed MI interventions was 2.4 (SD, 0.5); the mean score of the relational component was 2.8 (SD, 0.8). At the second level, we checked if the three telephone calls had been done during the 2 month interval as planned. All the telephone calls had been done."

**Co-interventions:** none

**Comparator description:** patients and caregivers in the control group received standard care that consisted of medical check-ups every 6 to 12 months depending on their HF condition and information given orally on HF and its treatment

All participants in the 3 arms received informational material focused on HF self-care

**Co-interventions:** none

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: HRQoL, psychological well-being, social support and connectedness</th>
</tr>
</thead>
</table>

**Notes**

**Trial funding:** this study was funded by the Center of Excellence for Nursing Scholarship, Rome, Italy

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Vellone 2020 (Continued)
Volpp 2017

Study characteristics

Methods

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** recruited from 5 insurance partners and through medicare free-for-service
- **Country:** USA
- **Dates study conducted:** March 2013 to January 2015
- **Maximum follow-up:** 1 year

Participants

- **Participants (patients)**
  - **Inclusion criteria:** eligible participants were 18 to 80 years old, were currently prescribed at least 2 of the 4 study medications (statin, aspirin, β-blocker, antiplatelet agent) based on patient self-report at time of enrolment, were hospital inpatients for 1 to 180 days, and were discharged to home with a principal International Classification of Diseases, Ninth Revision, diagnosis code of AMI
  - **Exclusion criteria:** key exclusion criteria included diagnosis of metastatic cancer, end-stage renal disease with requirement of dialysis, dementia, or enrolment in other research studies incorporating electronic pill bottles
  - **N randomised:** total: 1509; intervention: 1003; comparator: 506
  - **Diagnosis (% of participants):** MI: 100%
  - **Age (mean ± SD):** intervention: 61.2 ± 10.4; comparator: 60.6 ± 10.2
  - **Percentage male:** intervention: 65.7%; comparator: 62.2%
  - **Ethnicity:** NR
  - **Socio-economic status (income, occupational class, education):** NR
  - **Participants (supporters - if available):**
    - **Relationship to patient:** friend or family member
    - **Age (mean ± SD):** NR
    - **Sex (% male):** NR
  - **How identified/nominated/recruited:** enlisted by the participant

Interventions

- **Intervention description:** All participants randomised to the intervention arm received:
  1. up to 4 electronic pill bottles (Vitality GlowCaps) used in place of regular pill bottles for cardiovascular medications (β-blockers, statins, aspirin, anti-platelet agents);
  2. daily lottery incentives with an approximately 1 in 5 chance of a USD $5 payout and a 1 in 100 chance of a $50 payout based on medication adherence the previous day;
  3. the option of enlisting a friend or family member to support medication adherence who would be automatically notified if participants failed to use the electronic pill bottles 2 out of the 3 previous days, including the previous day;
  4. access to social work resources; and
5. a staff engagement advisor to provide close monitoring, feedback, and reinforcement of adherence.

**Theoretical underpinning:** built on principles of behavioural economics

**Type of intervention:** multicomponent

**Components:** wireless technology (pill bottle), social support, remote feedback from advisors

**Type of support:** instrumental

**Support provided by:** friend or family member

"Engagement Advisors (EA) called potential support partners to explain their role and obtain their consent, and then created a WTH (Way to health – website) account for them, confirming their preferred alert mode (email, text message, or automated phone call). Support partner feedback was triggered by 2 out of 3 days of patient nonadherence (including the last day) and continued daily until the patient became adherent again. After 6 consecutive days of nonadherence, the patient received a message via WTH indicating that the EA (NB engagement advisor) would contact the support partner unless the patient returned contact within 24 hours; if no contact occurred, the EA called the support partner, provided information on the patient’s nonadherence, and indicated that the EA would contact the patient’s physician in 1 week if there was no patient contact. The support partner also received an automated WTH message 2 months before the patient’s program end date."

**Setting:** home

**One-to-one/group:** one-to-one

**Face-to-face/remote (telephone/online):** remote

**Time of start after event/diagnosis:** up to 60 days after discharge

**'Intensity' (no. contacts/sessions + session/contact duration):** Variable: "Support partners - support partner feedback was triggered by 2 out of 3 days of patient nonadherence (including the last day) and continued daily until the patient became adherent again.

Engagement Advisors - EAs monitored the patient’s nonadherence and intervened only with automated WTH feedback."

**Total programme duration:** 1 year

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** usual care

**Co-interventions:** NR

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: all-cause mortality, cardiovascular mortality, all-cause hospitalisation, cardiovascular hospitalisation, myocardial infarction</th>
</tr>
</thead>
</table>

**Notes**

**Trial funding:** this trial was funded with a grant from Center for Medicare & Medicaid Innovation (CMS), Health Care Innovation Award 1C1CMS331009

**Declarations of interest:** "Drs Volpp and Asch are principals and owners of VAL Health. Dr Volpp has served as a consultant for CVS Caremark and received grants from CVS Caremark, Hawaii Medical Services Association, Humana, Merck, Weight Watchers, and Discovery (South Africa). Dr Troxel serves on the Scientific Advisory Board of VAL Health. The authors who are employed by commercial insurance companies are salaried employees of these companies. Ms Levin and Mr Relish are salaried employees of Humana Inc. Dr Negin is a salaried employee of Horizon Blue Cross Blue Shield of New Jersey. Drs Smith-McLallen and Snyder are salaried employees of Independence."
### Study characteristics

#### Study design:
- **RCT** (individual participant allocation)

#### Number of centres:
- 1

#### Country:
- USA

#### Dates study conducted:
- NR

#### Maximum follow-up:
- 6 months

#### Participants (patients)

**Inclusion criteria:**
1. confirmed diagnosis of HF;
2. have a primary care partner (spouse, daughter/son, or other relative/close friend who involved in patient’s HF care) identified by the patient as the person most involved in their HF care;
3. missed at least one dose of HF medicine in the prior 7 days;
4. have stable doses of HF medications for at least 3 months;
5. reside in a setting where the patient was responsible for his/her own medication administration;
6. aged 21 years or older; and
7. have a working landline or cell phone.

**Exclusion criteria:**
1. cognitive impairment measured by the Mini-Cog Exam, a three-word recall test and a clock-drawing test; those with a word recall score of 0 or a word recall of ≤ 2 and an abnormal clock test (i.e. inability to place the hands of the clock correctly to represent a designated time) were excluded;
2. co-existing terminal illness such as end-stage renal disease, advanced malignancy, or any other condition with < 1-year life expectancy;
3. receiving hospice care;
4. psychotic illness;
5. current alcohol dependence or other substance abuse; or
6. inability to speak English or other communication barrier.

**N randomised:**
- total: 47; intervention: 24; comparator: 23

**Diagnosis (% of participants):**
- HF: 100%

**Age (mean ± SD):**
- intervention: 65 ± 12; comparator: 67 ± 9

**Percentage male:**
- intervention: 48%; comparator: 70%

**Ethnicity:**
- race, black - intervention: 70%; control: 50%

**Socio-economic status (income, occupational class, education):**
- Education (years): intervention: 13 ± 3; control: 12 ± 3

**Participants (supporters - if available):**
- **Relationship to patient:** primary caregiver (unpaid), mostly spouses and adult children

**Age (mean ± SD):**
- 55.2 ± 15.3

**Sex (% male):**
- 29%

**How identified/nominated/recruited:**
- primary caregiver
Intervention description: " Intervention—The family focus of the FamLit intervention is designed to help patients-care partners learn the importance of working together to achieve medication adherence. The intervention emphasized skill building (understanding, communication, and support) and patient-care partner teamwork as the prime methods of improving medication adherence. Skills were developed through increasing the patient-care partner’s knowledge of HF specific symptoms and treatment and that knowledge was confirmed by asking patients-care partners to teach-back, and through discussion, coaching, practice, and roleplay in providing appropriate emotional/practical support and overcoming barriers to medication adherence. To be literacy-sensitive, the FamLit intervention used an intervention guide that could be easily understood by those with low health literacy but was also appealing to people with higher health literacy. We also used the “Teach-To-Goal” (TTG) approach to provide longitudinal support, a well-established and effective intervention developed by health literacy experts for HF patients with low health literacy. Although most health behavior theories assume that people clearly understand the information provided by the healthcare provider, in reality, many patients and their care partners do not understand the instructions. Literacy-sensitive approaches recognize that people with different levels of health literacy learn at different rates, but the vast majority can master material if they have more opportunities to be given instructions at their level of understanding and more opportunities to ask questions, clarify their concerns, and practice by roleplaying. A TTG intervention gives each patient-care partner multiple opportunities to improve their understanding until they reach full understanding and have the skills, they need to improve their medication adherence. The multi-component FamLit intervention was delivered by a trained interventionist with expertise in cardiovascular care using the FamLit intervention guide, which was given to each patient-care partner in the FamLit intervention group to take home… The Guide is written at 4th-grade level and is thus “easy to understand” as assessed by Flesch–Kincaid Grade Level and the Flesch Reading Ease scale. The interventionist used the FamLit intervention guide in the in-person and phone booster sessions. The guide included strategies to: 1) build positive attitudes toward medication adherence by discussing the relationship between HF symptoms and treatment and the importance of medication adherence; 2) coach patients-care partners to learn and practice how to better communicate with and support each other to work together as a team, build positive subjective norms and enhance communication and support; 3) elicit barriers and major concerns about adhering to medications; 4) help patients-care partners with decision making through discussion of the pros and cons of making a behavior change, and provide a menu of potential solutions to overcome patients-care partners’ barriers and concerns; and (5) coach the patient-care partner in setting specific goals to increase their motivation and reinforce when any goal is met. The intervention had four pre-specific intervention goals. Intervention Goal 1 was to use HF specific instruction and the teach-back strategy to encourage positive attitudes and knowledge, patients-care partners demonstrated basic understanding of HF, HF symptoms, HF medications and medication adherence. The interventionist explained HF and HF symptoms, described how suboptimal medication adherence results in HF symptoms, discussed the importance, benefits and positive outcomes of medication adherence, and asked patients-care partners to teach back to evaluate their understanding and clarify any misunderstanding. Intervention Goal 2 was to use coaching and role playing to build positive subjective norms and enhance patient-care partner communication and support. Patients-care partners learned and demonstrated how to communicate and support regular and continuous patient adherence to medications. The interventionist engaged patients-care partners in role playing to learn and practice how to communicate and support each other to work together as a team continuously. Intervention Goal 3 was to use coaching and role playing to increase perceived behavioral control of medication adherence and tailor to individualized barriers. Patients-care partners identified and used appropriate strategies to overcome their individualized barriers to medication adherence. The interventionist helped patients-care partners identify barriers to medication adherence such as forgetting, lack of motivation, or distrust in the provider, and then explore strategies to address/eliminate those barriers, using scenarios to engage patients-care partners in practicing how to overcome their specific barriers. Intervention Goal 4 was to set attainable goals for better medication adherence by enhancing patient-care partner’s motivation to improve medication adherence. The interventionist and patient-care partners set specific and attainable goals/ action plans jointly for better medication adherence in daily routine. To determine whether these intervention goals were reached, we required patients and care partners to answer 10 questions on our checklist correctly/appropriately. Patients-care partners in the FamLit intervention group received a 45-60 minute in-person intervention session at baseline. Together, the interventionist and patient-care partner reviewed the FamLit intervention guide that incorporated multiple components to achieve the four intervention goals. Phone sessions occurred one week after the in-per-
social session to continue to work with patients-care partners on improving attitudes/knowledge, subjective norms, communication, support, and perceived behavioral control, and to raise their questions/concerns and to confirm their understanding/implementation of the content and skills coached/practiced in the in-person session. Interventionists using a script continued bi-weekly phone sessions until patients and care partners accomplished the four intervention goals. All patients-care partners continued with their usual HF care from their physician or HF specialist/nurse practitioner.

Theoretical underpinning: “The study’s conceptual framework integrates the Theory of Planned Behavior (TPB) with Lee’s model of care partner support, and links health literacy to health outcomes. The TPB, with three constructs —attitudes/knowledge, subjective norms, and perceived behavioral control — is commonly used in studies to change/improve health behaviors, including medication adherence. Attitudes/knowledge are the individual’s beliefs about the outcomes of adhering to prescribed medications, weighted by whether the individual considers those outcomes essential. Subjective norms are care partners’ beliefs about the importance of medication adherence and their approval or disapproval, support or lack of support of medication adherence, weighted by the level of the individual’s motivation to comply with the approval/disapproval of care partners. Perceived behavioral control reflects patients’ and care partners’ perceived barriers, such as financial needs/distress and the presence or absence of resources for taking prescribed medications, weighted by the perceived impact of barriers and resources (e.g., costs of refilling the prescriptions or making other purchases). Patients with low health literacy (purple) had poorer ability to understand commonly-used prescription medication labels and medication warning labels. In addition, low health literacy was associated with poor self-care behaviors, and increased hospitalizations and death. Lee’s model posits that care partner support may alleviate the adverse effects of low health literacy in which low health literacy patients with more care partner support improve their ability to obtain, understand and apply medication information, thus promoting healthy behaviors and reducing hospitalization. We therefore developed the FamLit intervention (blue) targeting patients’ and their care partners’ attitudes/knowledge, subjective norms, and perceived behavioral control and facilitating patient-care partner communication and support to improve patient medication adherence and outcomes. FamLit includes easy-to-read intervention materials and “Teach-To-Goal” strategies. In this study, we tested whether the FamLit intervention improved and sustained medication adherence using multiple complementary strategies: HF specific instruction, coaching, role playing, teach-back, and goal setting. We hypothesized that patients who received the multi-component FamLit intervention would demonstrate better medication adherence than the control group, and that the intervention effect would be sustained for three months after intervention completion.”

Type of intervention: multicomponent

Components: meetings, support, role play, education, telephone support

Type of support: informational + instrumental + emotional

Support provided by: unpaid primary caregiver

“Skills were developed through increasing the patient-care partner’s knowledge of HF specific symptoms and treatment and that knowledge was confirmed by asking patients-care partners to teach-back, and through discussion, coaching, practice, and roleplay in providing appropriate emotional/practical support and overcoming barriers to medication adherence. Patients-care partners in the FamLit intervention group received a 45-60 minute in-person intervention session at baseline. Together, the interventionist and patient-care partner reviewed the FamLit intervention guide that incorporated multiple components to achieve the four intervention goals.”

Setting: home

One-to-one/group: one-to-one

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: NR
**Wu 2019 (Continued)**

'Intensity' (no. contacts/sessions + session/contact duration): at home until patient achieved 4 goals. Caregiver received 1 x baseline 45- to 60-minute intervention sessions then follow-up phone sessions bi-weekly until the patient achieved the 4 goals

**Total programme duration:** 3 months

**Adaptation:** Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

**Adherence/fidelity assessed:** NR

**Co-interventions:** none

**Comparator description:** usual care plus

"In order to equalize the attention provided to the two groups (FamLit and control groups) and reduce potential confounding, patients-care partners in the attention control group were given same amount of time as patients-care partners in the intervention group. Therefore, patients-care partners in the control group had one in-person session focusing on patient’s general health, and they were free to interact with the nurse interventionist and ask any topics the patients-care partners want to discuss. Patients-care partners also received bi-weekly phone calls to address any concerns they had related to patient’s general health."

**Co-interventions:** none

**Outcomes**

**Outcomes measured:** no outcomes of interest

**Notes**

**Trial funding:** this study was supported by funding from the National Institute of Nursing Research of the National Institutes of Health under Award Number K23NR014489 (Jia-Rong Wu, PI)

**Declarations of interest:** NR

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**Yeh 2016**

**Study characteristics**

**Methods**

**Study design:** RCT (individual participant allocation)

**Number of centres:** 3

**Country:** USA

**Dates study conducted:** NR

**Maximum follow-up:** 6 months

**Participants**

**Participants (patients)**

**Inclusion criteria:**

Inclusion criteria were:
1. physician diagnosis of chronic systolic HF;
2. left ventricular ejection fraction 40% or lower in the past 2 years;
3. stable medical regimen, defined as no major changes in medication in the past 3 months; and
4. New York Heart Association class I, II, or III HF

**Exclusion criteria:**

Exclusion criteria were:
1. unstable angina or myocardial infarction in the past 3 months;
2. major cardiac surgery within the past 3 months;
3. history of cardiac arrest in the past 6 months;
4. history of cardiac resynchronisation therapy in the past 3 months;
5. unstable serious ventricular arrhythmias;
6. unstable structural valvular disease;
7. current participation in a conventional cardiac rehabilitation programme;
8. diagnosis of peripartum cardiomyopathy within the preceding 6 months;
9. inability to perform a bicycle stress test;
10. lower extremity amputation or other inability to ambulate owing to conditions other than HF;
11. severe cognitive dysfunction (Mini-Mental State Examination score ≤ 24);
12. inability to speak English; and
13. regular practice of tai chi.

N randomised: total: 100; intervention: 50; comparator: 50

Diagnosis (% of participants): HF: 100%

Age (median, IQR):
intervention: 69, 60 to 76; comparator: 66, 60 to 73

Percentage male:
intervention: 56%; comparator: 72%

Ethnicity:
White - intervention: 86%, control: 86%
Black – intervention: 10%, control: 10%
Asian/Pacific Islander – intervention: 2%, control: 4%
American Indian – intervention: 2%, control: 0

Socio-economic status (income, occupational class, education):
Annual income USD $:
< 25,000 - intervention: 24%, control: 28%
25,000 to 50,000 – intervention: 20%, control: 16%
51,000 to 100,000 – intervention: 24%, control: 24%
> 100 000 – intervention: 18%, control: 18%
Refused to answer – intervention: 14%, control: 14%

Participants (supporters - if available):
Relationship to patient: fellow participants
Age (mean ± SD): see above
Sex (% male): see above

How identified/nominated/recruited: see above

Interventions

Intervention description: "The tai chi intervention consisted of 1-hour group classes held twice weekly for 12 weeks. We used the standard protocol of a pilot trial in patients with HF. The development of that program was guided by similar interventions used in tai chi trials with elderly patients and those with limited mobility. The protocol included traditional warm-up exercises and 5 subsequent simplified tai chi movements. Each cohort was taught by 1 or 2 certified and experienced instructors (6 total study instructors with average experience of 20 years). Warm-up exercises included weight shifting; arm swinging; gentle stretches of the neck, shoulders, spine, arms, and legs; visualization techniques; and traditional breathing methods. These exercises focus on releasing tension in the body, incorporating mindfulness and imagery into movement, increasing awareness of breathing, and promoting overall relaxation of body and mind. The core tai chi movements were adapted from Master Cheng Man-Ch’ing’s Yang-style short form and performed repetitively. Chairs were provided for resting, and patients were allowed to progress at their own comfort and pace. We provided a 35-minute instructional videotape that outlined the exercises presented in class. Patients were encouraged to practice at home at least 3 times per week. Class attendance was monitored and adherence to home practice was tracked via self-report logs. Participants also received the same educational pamphlets used in our education (control) group (described in next section) with a brief (<5-minute) explanation toward the end of 1 tai chi session weekly."
Pamphlets:
The 12 weekly modules included (1) taking control of your HF, (2) how to follow a low-sodium diet, (3) HF medicines, (4) self-care and dealing with HF symptoms, (5) exercise and activity, (6) managing feelings about HF, (7) tips for family and friends, (8) lifestyle changes, (9) advanced directives, (10) heart rhythm problems, (11) new HF treatments, and (12) high blood cholesterol levels."

Theoretical underpinning: NR

Type of intervention: multicomponent

Components: group exercise and education

Type of support: instrumental

Support provided by: fellow participants/patients with HF

Setting: unclear

One-to-one/group: group

Face-to-face/remote (telephone/online): face-to-face

Time of start after event/diagnosis: NR

'Intensity' (no. contacts/sessions + session/contact duration): 1-hour classes, 2 x per week

Total programme duration: 12 weeks

Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed: NR

Adherence/fidelity assessed: class attendance was monitored and adherence to home practice was tracked via self-report logs

Adherence to the study protocol was good. The mean proportions of classes attended were 18 of 24 (75.0%) and 16 of 24 (66.7%) in the tai chi and education groups, respectively. The mean (SD) number of hours of home tai chi practice during the 12 weeks was 9.6 (9.9) hours. At 6 months' follow-up telephone contact, 34 patients in the tai chi group (68.0%) reported continued practice (including daily, weekly, and monthly).

Co-interventions: none

Comparator description: "Patients in the attention control group attended education sessions twice weekly (same duration and frequency as the tai chi group). Classes were led by a nurse practitioner and followed the content of the 11 Heart Failure Society of America education modules. An additional module on cholesterol was added, using patient information from the National Heart, Lung and Blood Institute. The 12 weekly modules included (1) taking control of your HF, (2) how to follow a low-sodium diet, (3) HF medicines, (4) self-care and dealing with HF symptoms, (5) exercise and activity, (6) managing feelings about HF, (7) tips for family and friends, (8) lifestyle changes, (9) advanced directives, (10) heart rhythm problems, (11) new HF treatments, and (12) high blood cholesterol levels. Each module consisted of a pamphlet that was distributed weekly and discussed during the 2 sessions conducted for each module. We asked participants not to start tai chi during the study period; however, they were offered the opportunity to take tai chi classes at the end of the 6-month follow-up period."

Co-interventions: none

Outcomes

Outcomes measured: all-cause mortality, all-cause hospital admission, cardiovascular hospital admission, HRQoL, psychological well-being, social isolation and connectedness, adverse events

Notes

Trial funding: this study was supported by an award from the National Institutes of Health, National Center for Complementary and Integrative Health (Phillips, R01AT002454)
Declarations of interest: "Peter Wayne, PhD, is the founder and sole owner of the Tree of Life Tai Chi Center. Dr Wayne’s interests were reviewed and are managed by the Brigham and Women’s Hospital and Partners HealthCare in accordance with their conflict-of-interest policy. Other authors declare no conflicts of interest."

### Yehle 2009

#### Study characteristics

**Methods**

- **Study design:** RCT (individual participant allocation)
- **Number of centres:** NR
- **Country:** USA
- **Dates study conducted:** July 2005 to August 2006
- **Maximum follow-up:** 8 weeks

**Participants**

- **Participants (patients)**
  - **Inclusion criteria:** 52 adults with a diagnosis of HF and living in north central Indiana were enrolled in the study. Participants had either systolic or diastolic HF.
  - **Exclusion criteria:** participants were excluded if there was cognitive impairment present or an inability to read or speak English, or if the participant resided in a nursing home
  - **N randomised:** total: 52; intervention: NR; comparator: NR (completers n = 34, non-completers n = 18)
  - **Diagnosis (% of participants):** HF: 100%
  - **Age (mean ± SD):** completers: 67.3 ± 14.5; non-completers: 66.6 ± 10.7
  - **Percentage male:** completers: 59%; non-completers: 61%
  - **Ethnicity:** NR
  - **Socio-economic status (income, occupational class, education):** NR
  - **Relationship to patient:** fellow patient and optional friend or family
  - **Age (mean ± SD):** NR
  - **Sex (% male):** NR
  - **How identified/nominated/recruited:** NR

**Interventions**

- **Intervention description:** participants in the intervention group privately saw the clinic’s one nurse practitioner for a 10-minute physical examination and met in a group of up to 6 other patients with HF plus a friend or family member for a 1-hour semistructured education and support group. Half of the intervention group had their physical examination before the group time, and half received it after the group time. The education was provided by the nurse practitioner and the primary investigator. Medications and recent laboratory results were also discussed.
  - **Theoretical underpinning:** Knowles’ theory of andragogy
  - **Type of intervention:** multicomponent
  - **Components:** physical examination, education and social support
**Type of support:** emotional  
**Support provided by:** fellow patient, optional friend or family  
**Setting:** centre  
**One-to-one/group:** group  
**Face-to-face/remote (telephone/online):** face-to-face  
**Time of start after event/diagnosis:** NR  
**'Intensity' (no. contacts/sessions + session/contact duration):** 1 x 1-hour session  
**Total programme duration:** 1 session  
**Adaptation: Tailoring (to individuals)/modification (of overall prog during study) allowed:** NR  
**Adherence/fidelity assessed:** NR  
**Co-interventions:** none  
**Comparator description:** participants in the control group saw the nurse practitioner for a one-on-one 30-minute visit. The participant received a physical examination and was provided time to ask questions related to living with HF in addition to discussing medications and recent laboratory results. A family member may or may not be present for the follow-up appointment.  
**Co-interventions:** none

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Outcomes measured: all-cause hospital admission</th>
</tr>
</thead>
</table>

**Notes**

Data are reported as completers vs non-completers  
**Trial funding:** NR  
**Declarations of interest:** NR

ACEI: angiotensin-converting-enzyme inhibitor  
ACS: acute coronary syndrome  
AF: atrial fibrillation  
APN: advanced practice nurse  
ARB: angiotensin receptor blocker  
CABG: coronary artery bypass graft  
CABS: coronary artery bypass surgery  
CAD: coronary artery disease  
CBT: cognitive behavioural therapy  
CHD: coronary heart disease  
CVD: cardiovascular disease  
CI: confidence interval  
CR: cardiac rehabilitation  
ECG: electrocardiogram  
EF: ejection fraction  
FCEM: family-centred empowerment model  
HAPA: health action process approach  
HF: heart failure  
HP: healthcare professional  
HRQoL: health-related quality of life  
IHD: ischaemic heart disease  
IQR: interquartile range  
IVR: interactive voice response  
MI: myocardial infarction  
NA: not applicable  
NCM: nurse care management

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)  
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Characteristics of excluded studies [ordered by study ID]

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Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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

**Ahn 2022**
- **Methods**: RCT
- **Participants**: Heart failure
- **Interventions**: “Heart Failure-Smart Life II” mobile app
- **Outcomes**: HRQoL
- **Notes**: Top up search: awaiting classification

**Caggianelli 2022**
- **Methods**: RCT
- **Participants**: Heart failure
- **Interventions**: MOTIVATE-HF
- **Outcomes**: No outcomes of interest
- **Notes**: Top up search: awaiting classification
<table>
<thead>
<tr>
<th>Study ID</th>
<th>Methods</th>
<th>Participants</th>
<th>Interventions</th>
<th>Outcomes</th>
<th>Notes</th>
</tr>
</thead>
</table>
| ChiCTR2100044879 | RCT | CHD | Control group: WeChat applet + step goal setting  
Individual group: WeChat applet + step goal setting + gamification  
Team group: WeChat applet + step goal setting + gamification + collaboration | Physical activity, psychological well-being | Top up search: awaiting classification |
| CTRI/2021/09/036328 | RCT | Acute MI | E-booklet on nurse-led cardiac rehabilitative tele-interventions | Hospital admission | Top up search: awaiting classification |
| Deek 2021 | RCT | Heart failure | Family focused Approach to Improve Heart Failure care In LebanonQuality intervention (FAMILY) study | Mortality, hospital admission | Top up search: awaiting classification |
| Elias 2020 | Study design: cluster-RCT or non-randomised  
No of centres: NR  
Country: Canada  
Maximum follow-up time: 26 weeks | Inclusion criteria: | | | |
Elías 2020 (Continued)

- Women who have been hospitalised at UOHI in the past year with stable CHD, including: AMI; stable angina with corroborating evidence of CHD; recent CABG; or percutaneous coronary intervention (to allow examination of mechanisms linking the intervention and psychosocial well-being with health and healthcare outcomes)
- Women ≥ 18 years of age (the age of consent in Ontario)
- Women able to read and understand English or French
- Women who reside in Ontario and are eligible for Ontario Health Insurance Plan (to permit linkage with administrative data housed at the Institute for Clinical Evaluative Sciences (ICES))
- Women available to participate over the next 6 months (the intervention and data collection takes place over this time frame - reducing the probability of missing data)
- Women able to provide informed consent

Exclusion criteria:

- Women who have been hospitalised primarily for valve replacement or repair, HF, pulmonary hypertension, endocarditis or pericarditis (to reduce heterogeneity and avoid confounding when examining mechanisms linking the intervention and psychosocial well-being with health and healthcare outcomes)
- Women who, in the opinion of the UOHI clinical psychologist, manifest psychiatric illness or cognitive impairment that would preclude participation in W@H (i.e. they are unable to benefit from the intervention, to prevent disruption of other participants)

Interventions

**Intervention description:** “Participants in the W@H group will be assembled in small groups of 6-12 participants and attend 12-biweekly sessions over a 24-week intervention period. The sessions will be led by a trained peer leader and will be held in a variety of convenient locations in close geographic proximity to participants’ home postal codes. Participants will receive a manual containing copies of learning exercises and educational material. Session content is focused on: emotional support (sharing your story, road to recovery, exploration of feelings, coping with changes, emotional management, coping with distress, effective communication, empowerment); informational support (self care behaviours, risk factor education and management, health care system and community resource navigation); and appraisal support (goal setting, action planning, problem solving, relapse prevention).”

**Type of intervention:** social support only

Comparator description: “Participants in the control group will be eligible to participate in the study, but cannot participate because there are no groups within their geographical region. They will be offered the W@H program after their 26-week follow up.”

Outcomes

HRQoL, psychological well-being, smoking, physical activity

Notes

Ongoing study - not clear whether a cluster-randomised controlled trial or non-randomised

Iovino 2021a

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Interventions</td>
<td>MOTIVATE-HF</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Mortality</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
</tr>
</tbody>
</table>
### Iovino 2021b

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
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</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Interventions</td>
<td>MOTIVATE-HF</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Mortality</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
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</tbody>
</table>

### Irani 2021

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Interventions</td>
<td>eHealth dyadic teamwork intervention</td>
</tr>
<tr>
<td>Outcomes</td>
<td>HRQoL</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
</tr>
</tbody>
</table>

### Irct20100725004443N

<table>
<thead>
<tr>
<th>Methods</th>
<th>Study design: RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of centres: single centre</td>
</tr>
<tr>
<td></td>
<td>Country: Iran</td>
</tr>
<tr>
<td></td>
<td>Maximum follow-up time: 3 weeks post intervention</td>
</tr>
<tr>
<td>Participants</td>
<td>Inclusion criteria: history of heart failure diagnosis for at least 1 year; have ability to read and write; ejection fraction less than 40% diagnosed by a specialist; class II and III of heart failure; no diagnosed psychological disorders; hospitalisation for the first time; living with a family member.</td>
</tr>
<tr>
<td></td>
<td>Exclusion criteria: dissatisfaction with the patient to continue co-operation at the time of the intervention; patient entry to class IV heart failure; not attending workshops even for one meeting; patient death; lack of access to the patient at the end of the intervention</td>
</tr>
<tr>
<td>Interventions</td>
<td>Intervention description: “Training based on the health literacy index, using the educational manual and the general content, regarding that the dimensions of self-care includes maintenance (sustainability of physiological status), management (response to symptoms at the time of occurrence), and self-care confidence will be taught in 3 Individual 60-minute sessions and then exchange with peers, sharing information, expressing experiences in response to symptoms and self-care methods, after conducting an individual training session, two workshops for all the test group will be attended by 8 Up to 12 patients in each group on a weekly basis at the Clinic of the heart of Amini Hospital in the agreed hours and upon request by the nurse-researcher will be held. The group members will be held for at least 60 minutes. During counseling sessions, telephone counseling with patients (once a week) based on the needs of patients with content encouraging compliance with care education, hearing patient speeches and answering questions will be done.”</td>
</tr>
<tr>
<td></td>
<td>Type of intervention: multicomponent</td>
</tr>
<tr>
<td>Study ID: IRCT20100725004443N</td>
<td>Comparator description: the control group will receive care, medication orders, and routine clinic recommendations</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Outcomes</td>
<td>All-cause hospital admission</td>
</tr>
<tr>
<td>Notes</td>
<td>Not known whether study is complete</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study ID: IRCT20100725004443N30</th>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Heart failure</td>
<td></td>
</tr>
<tr>
<td>Interventions</td>
<td>Comprehensive tele-empowerment programme</td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td>Hospital admissions</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Study ID: IRCT2015100624395N</th>
<th>Study design: RCT</th>
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<tbody>
<tr>
<td>No of centres</td>
<td>single centre</td>
</tr>
<tr>
<td>Country</td>
<td>Iran</td>
</tr>
<tr>
<td>Maximum follow-up time</td>
<td>3 months post intervention</td>
</tr>
</tbody>
</table>

| Participants                  | Inclusion criteria: "Willingness to participate in the study; The age range of 65-18 years; living in Mashhad; Artificial valve replacement surgery; The first shift valve replacement surgery; Failure to develop an advanced chronic disease (stroke, kidney failure) and lack cognitive and mental disorders (Alzheimer’s, depression); Loss of speech and hearing problems; Having read and write; The patient has no health personnel; A family member (spouse, child, sister, etc.) that further cooperation in the field of health-care and the patient is Family members living with the patient; Lack of family members to valve disease Inclusion criteria 10, 11, and 12 will be considered for patients in the intervention group. Inclusion criteria of active member of the family: willingness to participate in research; having read and write; lack of drug addiction; without the risk of heart valve disease; Is not of Health care worker" |
| Interventions                 | Exclusion criteria: "unwillingness of research or a member of his family to cooperate at every stage of research; hospitalization for any reason at any stage of research; changes in the anticoagulant medication; The incidence of postoperative complications requiring surgery, physical or mental problems that lead to disability at any stage of the research." |

| Interventions                 | Intervention description: "The education will be implemented based on the family-centered empowerment model steps as follows: 1 - the first step is to increase the participants’ perceived threat (severity and susceptibility). The perceived severity means to understand the risk of the absence of proper caring behavior and the perceived susceptibility means to comprehend how a person is at risk for the diseases resulting from lack of proper caring behavior. Thus, by Two 45-60 minute sessions by Individual Training, group discussions and question and answer that will lead to complications and problems, we will try to improve the perceived threat (severity and perceived susceptibility), 2 - the second step is problem solving. Problem solving will be conducted via group discussions in a manner that promotes the participants’ self-esteem. The goal of this step is understanding the problems providing their solutions. The problem-solving sessions will hold in one 45-60 minute session." |
small group discussions under supervision of the researcher in discharging day. In these sessions, some objective examples of their problems with the caring behaviors will be presented. Then, the researcher conducts the group-discussion and let them to modify their wrong caring behaviors. At this stage, the caregivers get practically familiar with their problems and their solving process. This issue will enhance their self-efficacy. 3- the third step is participation in the training. In this step, the patient transfer the discussed topics in the previous meetings by the pamphlets and a booklet to active member of the family. 4- the fourth step is evaluation. It includes two stages, process evaluation and final evaluation. The final evaluation will be performed 1.5 months after discharge.”

**Type of intervention:** social support only

**Comparator description:** control group will be provided 1 training session of 45 to 60 minutes on discharge day

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>No outcomes of interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td>Not known whether study completed</td>
</tr>
</tbody>
</table>

**Methods**

RCT

**Participants**

CHD

**Interventions**

Integrative behavioural couple therapy, narrative couple therapy and couple schema therapy

**Outcomes**

Psychological well-being, HRQoL

**Notes**

Top up search: awaiting classification

IRCT2015100624395N

IRCT20180428039458N2

IRCT202009222048806N1

IRCT20201228049858N1

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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<table>
<thead>
<tr>
<th>Study</th>
<th>Methods</th>
<th>Participants</th>
<th>Interventions</th>
<th>Outcomes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Konerding 2021</td>
<td>RCT</td>
<td>Type 2 diabetes mellitus and/or CHD</td>
<td>This programme consists of 4 components: 1. Meetings of peer support groups 2. Personalised telephone-based health coaching for patients with low literacy and/or low patient activation 3. Personalised patient feedback 4. A browser-based web portal</td>
<td>Hospital admission, physical activity</td>
<td>Top up search: awaiting classification</td>
</tr>
<tr>
<td>Kyaw Tha Tun 2021</td>
<td>RCT</td>
<td>Women with CHD</td>
<td>Telephone-based peer support</td>
<td>Psychological well-being</td>
<td>Top up search: awaiting classification</td>
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<tr>
<td>Locatelli 2022</td>
<td>RCT</td>
<td>Heart failure</td>
<td>MOTIVATE-HF</td>
<td>No outcomes of interest - caregiver outcomes only</td>
<td>Top up search: awaiting classification</td>
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<tr>
<td>NCT03020316</td>
<td>Study design: RCT</td>
<td></td>
<td></td>
<td>No of centres: NR</td>
<td></td>
</tr>
</tbody>
</table>
Participants

Inclusion criteria:
For participants:
- Men and women aged 18 to 90
- English speaking
- Newly diagnosed with CAD (myocardial infarction (MI), percutaneous coronary intervention (PCI), coronary artery bypass graft (CABG), acute coronary syndrome, or any imaging test suggestive of CAD)

For mentors:
(Male mentors will be paired with male participants, and female mentors will be paired with female participants)
- Men and women aged 18 to 90
- English speaking
- Established (greater than 1 year prior to study) diagnosis of CAD (myocardial infarction (MI), percutaneous coronary intervention (PCI), coronary artery bypass graft (CABG) acute coronary syndrome, or imaging test suggestive of CAD)

Exclusion criteria:
For participants:
- Previously diagnosed CAD (MI, PCI, CABG, acute coronary syndrome or imaging test suggestive of CAD)
- Inability or unwillingness to provide written consent
- Non-English speaking
- Prior formal training and practice of TM

For Mentors:
- Inability or unwillingness to provide written consent
- Non-English speaking

Interventions

Intervention description: "Peer mentor and transcendental meditation.

Subjects will be assigned a peer mentor (a volunteer with CAD). After initial contact, the peer mentor and subject will be encouraged to communicate at whatever frequency or medium they deem most appropriate. This may include speaking by telephone, personal email or meeting in person. Mentors (and subjects if willing) will be asked to keep a log of such contacts, which will be provided to the study staff at interval reassessments.

In addition to the peer mentor, subjects will be instructed in transcendental meditation (TM) in the standard manner by a trained TM instructor."

Type of intervention: multicomponent

Comparator description: "Usual care. Subjects will be encouraged to follow-up with their primary physicians. Subjects will be informed that they will be periodically contacted by telephone and/or email by the research team for future assessments."

Outcomes

Hospital admission, psychological well-being, heart disease risk factors, physical activity

Notes

Not known if study completed; author contacted for status update 11 November 2021
### NCT04917159

**Methods**  
RCT

**Participants**  
Heart failure

**Interventions**  
Group-based acceptance and commitment therapy

**Outcomes**  
HRQoL, hospital admission

**Notes**  
Top up search: awaiting classification

---

### NCT04945486

**Methods**  
RCT

**Participants**  
CHD

**Interventions**  
Peer-mentoring

**Outcomes**  
HRQoL, psychological well-being, physical activity

**Notes**  
Top up search: awaiting classification

---

### NCT04966104

**Methods**  
RCT

**Participants**  
Heart failure

**Interventions**  
ODYSSEE-vCHAT consists of:
- Automated digital counselling resources (educational pages, videos, and interactive tools and trackers)
- Chatrooms available 24/7
- Weekly 30-minute presentations and discussions led by a healthcare professional or patient representative
- Each aspect is informed by a rotating schedule of 7 weekly self-care themes. Webcasts are recorded and streamed to our private YouTube channel, and associated hyperlinks are shared on the program. Participants may submit photographs depicting heart-healthy lifestyles and activities (with no identifying, sensitive, or personal information) to the Gallery Wall.

**Outcomes**  
Mortality, hospital admission, psychological wellbeing

**Notes**  
Top up search: awaiting classification

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### NCT04991857

**Methods**  
RCT

**Participants**  
Heart failure
### NCT04991857 (Continued)

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Technology-based family-centred empowerment programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes</td>
<td>HRQoL</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
</tr>
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</table>

### NCT05211882

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>Heart failure</td>
</tr>
<tr>
<td>Interventions</td>
<td>Immediate ENABLE nurse coaching, on top of usual care</td>
</tr>
<tr>
<td>Outcomes</td>
<td>HRQoL</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
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### NTR6181

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<th>Methods</th>
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<tr>
<td>No of centres</td>
<td>NR</td>
</tr>
<tr>
<td>Country</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Maximum follow-up time</td>
<td>27 months</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Participants</th>
<th>Inclusion criteria: BMI &gt; 30, age &gt; 18, coronary artery disease (myocardial infarction, angina pectoris), nonvalvular atrial fibrillation, referred to cardiac rehabilitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exclusion criteria: heart failure, left ventricle ejection fraction &lt; 40%, implantable cardioverter defibrillator, psychological or cognitive impairments which may limit cardiac rehabilitation, renal failure or other severe comorbidities which could impair cardiac rehabilitation</td>
</tr>
<tr>
<td>Interventions</td>
<td>Intervention description: &quot;OPTICARE XL: a one-year tailor-made behavioral group intervention including after-care, specific for obese CAD patients, with strong focus on self-management. Upon usual education sessions and facultative modules OPTICARE XL includes peer group modules on healthy weight and active lifestyle management, and tailored fitness training (aerobic and muscle strength).&quot;</td>
</tr>
<tr>
<td></td>
<td>Type of intervention: social support only</td>
</tr>
<tr>
<td>Comparator description</td>
<td>control group receives usual cardiac rehabilitation care</td>
</tr>
<tr>
<td>Outcomes</td>
<td>HRQoL, blood pressure, lipid profile, smoking status, physical activity</td>
</tr>
<tr>
<td>Notes</td>
<td>Unable to judge whether study meets eligibility criteria based on information provided in trial registration, ongoing study</td>
</tr>
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</table>
### Characteristics of ongoing studies

**Roshandel 2021**

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>CHD</td>
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<tr>
<td>Interventions</td>
<td>Peer education</td>
</tr>
<tr>
<td>Outcomes</td>
<td>HRQoL</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
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**Su 2021**

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>CHD</td>
</tr>
<tr>
<td>Interventions</td>
<td>Nurse-led eHealth cardiac rehabilitation (NeCR) system</td>
</tr>
<tr>
<td>Outcomes</td>
<td>HRQoL, psychological well-being, hospital admission</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
</tr>
</tbody>
</table>

**Xu 2022**

<table>
<thead>
<tr>
<th>Methods</th>
<th>RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>CHD</td>
</tr>
<tr>
<td>Interventions</td>
<td>Control group: WeChat applet + step goal setting; individual group: WeChat applet + step goal setting + gamification; Team group: WeChat applet + step goal setting + gamification + collaboration</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Physical activity, psychological well-being</td>
</tr>
<tr>
<td>Notes</td>
<td>Top up search: awaiting classification</td>
</tr>
</tbody>
</table>

**Abbreviations**

AMI: acute myocardial infarction  
BMI: body mass index  
CABG: coronary artery bypass graft  
CAD: coronary artery disease  
CHD: coronary heart disease  
HF: heart failure  
HRQoL: health-related quality of life  
MI: myocardial infarction  
NR: not reported  
PCI: percutaneous coronary intervention  
RCT: randomised controlled trial  
TM: transcendental meditation
Personalised self-management support programme

**Study design:** RCT  
**Number of centres:** multicentre (number of centres NR)  
**Country:** Germany  
**Maximum follow-up:** 18 months

**Inclusion criteria:**  
- Gender: male and female  
- Minimum age: 18 years  
- Maximum age: no maximum age  
- DMP (current regular primary care of patients with chronic conditions) enrolment, willingness to participate, sufficient German language skills

**Exclusion criteria:**  
- No ability to participate, consuming diseases, lack of German language skills

**Intervention description:** “The components of the intervention are the composition of peer support groups (PSG) with a leader from within their own ranks, interactive instruction by experts on exercise options and nutritional behaviour, use of an online platform for exchanging information with each other and the provision of information by experts. As well as telephone coaching for patients with motivation needs.”

**Type of intervention:** multicomponent

**Comparator description:** wait-list control:  
“The control group also gets access to the internet platform Regelversorgung. Eighteen months after the start of the examination, the control group receives the intervention modified according to the evaluation results.”

**Hospital admission, HRQoL**

**1 November 2020**

**Mr. Dr. Marcus Redaelli marcus.redaelli@uk-koeln.de**

---

**Heart up! (amended for COVID-19)**

**Study design:** RCT  
**Number of centres:** single centre  
**Country:** USA  
**Maximum follow-up:** 12 months

**Inclusion criteria:**  
- Adults ≥ 18 years old  
- Diagnosed with MI, unstable angina, who undergo percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery
Dunn 2021 (Continued)

- Use a cell phone with text messaging
- Receive a recommendation to engage in physical activity either at home or in a hospital-based cardiac rehabilitation setting
- Have a planned discharge home
- Can identify a significant other who can text message them
- Speak and read English
- Can complete the screening instrument
- A score of ≥ 1.8 on the 10-item state subscale of the State-Trait Hopelessness Scale

**Exclusion criteria:** none

**Interventions**

**Intervention description:** "Motivational social support from a nurse alone:

A 60-minute motivational interviewing session with a nurse, followed by 6 weeks of daily motivational social support text messages

Motivational social support from nurse with additional significant other support:

A 60-minute motivational interviewing session with a nurse, followed by 6 weeks of daily motivational social support text messages from both a nurse and the patient’s self-identified significant other."

**Type of intervention:** multicomponent

**Comparator description:** attention control:

A 60-minute session with a nurse focused on American Heart Association educational videos and written information

**Outcomes**

HRQoL, psychological well-being, physical activity

**Starting date**

1 August 2019

**Contact information**

s Dunn01@uic.edu

**Notes**

—

Gonzalez-Gonzalez 2020

**Study name**

Effectiveness and cost-effectiveness of a virtual community of practice to improve the empowerment of patients with ischaemic heart disease: study protocol of a randomised controlled trial

**Methods**

**Study design:** RCT

**Number of centres:** multi-centre (number NR)

**Country:** Spain (Autonomous Communities of Catalonia, Madrid and the Canary Islands)

**Maximum follow-up:** 18 months

**Participants**

**Inclusion criteria:** Age ≥ 18 years; active diagnosis in the electronic medical record (EMR) of IHD (International Classification of Primary Care Second Edition - ICPC-2 codes K74-76; or International Classification of Diseases 9th Edition - ICD-9 codes 410, 411, 411.8, 413, 414 and 414.9) in the year prior to inclusion in the study; Internet at home or smartphone; be able to follow the requirements of the study (e.g. digital literacy); have signed the informed consent

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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Exclusion criteria: Institutionalised, terminal illness, physical or mental disability that limits the ability to answer the questionnaires or when telephone/email contact is not available in the PCPs/hospitals' databases

Interventions

Intervention description: Virtual Communities of Practice (VCoP) "'e-mopera2' is a gamified VCoP on a web 2.0 platform based on the exchange of experiences and knowledge through participatory learning. Patients will have access to multidisciplinary professional support as needed and according to what was identified in the content-design stage (published elsewhere) that will potentially include general practitioners, cardiologists, psychologists, self-care and self-management specialists, nutritionist and others as necessary. Various thematic areas related to the empowerment of patients and self-care of IHD will be progressively covered: health competence, self-efficacy and activation improvement, behavioural changes, lifestyle/signs/symptoms monitoring, technical skills, chronic disease acceptance and shared decision-making. Special emphasis will be given to the changes recommended by European Guidelines for self-management of IHD including monitoring changes in symptoms, stress management, mental health and adherence to medication, diet, exercise plans, sodium cholesterol, and alcohol restriction and tobacco abstinence. The active role of a community manager, weekly emails as reminders and a gamified competitive score system will boost participation."

Type of intervention: social support only

Comparator description: patients allocated to both the intervention and the control group will continue with their usual self-care and professional care according to the local guidelines.

Outcomes

Lipid profile, smoking status, physical activity, depression, anxiety, HRQoL

Starting date

11 January 2021

Contact information

gonzalezgonzalez@allgemeinmedizin.uni-frankfurt.de

Notes

—

Li 2018

Study name

I-CARE

Methods

Study design: RCT

Number of centres: NR

Country: China

Maximum follow-up: 12 months

Participants

Inclusion criteria: ACS (acute coronary syndrome) includes ST-elevation myocardial infarction, non-ST-elevation myocardial infarction, and unstable angina. Participants will be at least 21 years old, and the ACS will be judged to be stable at the time of study enrolment

Exclusion criteria:

1. Severe CVD or medical comorbidity that indicates the patient's life expectancy is less than 12 months (e.g. New York Heart Association class IV heart failure, terminal cancer)
2. Seriously disabled (unable to travel to the hospital for follow-up treatment)
3. Suffering from problems that affect normal communication (e.g. intellectual impairment, aphasia, observed mental confusion suggesting dementia, deafness)
4. Non-permanent resident or permanent resident planning to move out of the region within 12 months
5. Pregnant or breast-feeding or planning pregnancy within 12 months
6. Established diagnosis of bipolar disorder, schizophrenia, psychotic depression, or acute suicidality
7. Alcohol dependence
8. Unable to provide written informed consent

Interventions

**Intervention description:** integrated model of care including:

- ACS secondary prevention programme: medication adherence, clinic follow-up visits, group counselling
- Comorbid depression care programme: screening for depression and anxiety, group counselling, individual counselling, referral for antidepressant medication if needed, immediate treatment for acute suicidality (if needed)

**Type of intervention:** multicomponent

**Comparator description:** "Other than implementation of the standard ACS care, no attempt will be made to influence the management of patients randomized to UC. However, any patient who obtains a BDI-II item 9 score ≥2 at either the 6- or 12-month follow-up assessments will be referred to a local mental health provider."

Outcomes

Psychological well-being, mortality, MI, rehospitalisation, HRQoL, blood pressure, lipids

Starting date

November 2014

Contact information

ywu@georgeinstitute.org.cn (Y. Wu)

Notes

—

NCT03159325

**Study name**
The healing circles project

**Methods**

**Study design:** RCT

**Number of centres:** multicentre (number NR)

**Country:** Canada

**Maximum follow-up:** 24 months

Participants

**Inclusion criteria:** individuals will be included for study if they (1) have a CVD (ischaemic heart disease, atrial fibrillation, heart failure, or patients with implantable cardioverter-defibrillator; together these are nearly 80% of patients with CVD); (2) are aged ≥ 19 years; (3) own or have regular access to either a smartphone (Android or iOS operating system), tablet, or laptop or desktop computer; and (4) can speak, write, and comprehend English

**Exclusion criteria:** individuals will be excluded if they (1) have cognitive or physical impairments that may interfere with effective interaction with the Healing Circles program; (2) have a known planned surgical intervention; (3) have another household member in the study; or (4) are unable to provide informed consent

Interventions

**Intervention description:** Healing Circles is an evidence-based and patient-informed novel self-management platform designed to support patients with CVD. It uses a private, secure social network that helps connect patients to one another, to personalised, disease management information, and provides functions to assist patients in self-management via evidence-based principles of behaviour change

**Type of intervention:** social support only
### Comparator description:
The usual care group will receive all standard treatment, instructions and information for patients with cardiovascular disease, but no Healing Circles programme.

### Outcomes
Social integration and support domains of the Health Education Impact Questionnaire, HRQoL, hospitalisation

### Starting date
August 2017

### Contact information
Scott Lear
slear@providencehealth.bc.ca

### Notes
—

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### NCT03632018

#### Study name
Heart Exercise And Resistance Training - Peer Lead Activity (HEART-PLAY)

#### Methods

**Study design:** RCT

**Number of centres:** 1

**Country:** USA

**Maximum follow-up:** 12 months

#### Participants

**Inclusion Criteria:**
- Age 18+
- Referred to the UCSD Step Clinic for 36 sessions of cardiac rehabilitation across 12 to 14 weeks for one of the following medical conditions: myocardial infarction, coronary artery bypass surgery, stable angina, heart valve repair or replacement, coronary angioplasty or stenting, or congestive heart failure
- Able to give informed consent in English
- Able to perform study assessments as described
- Blood pressure < 180/110 mmHg
- Able to perform light to moderate exercise
- Have not had a fall during the previous 6 months resulting in an injury
- Clinical staff’s permission to participate, including their assessment that participant is a good candidate for this particular research study
- Ability to complete written or computer-based surveys
- Completion of a post-consent comprehension test

**Exclusion Criteria:**
- Referred to CR following VAD (ventricular assist device) procedure, peripheral arterial disease (PAD), or heart or lung transplant. Angina not adequately managed with nitrates.
- Oxygen-dependent COPD
- Recent stroke or significant cerebral neurologic impairment that would interfere with participation
- Major depressive disorder per eMR

#### Interventions

**Intervention description:** "Participants in the HEART-PLAY will receive standard CR and additionally receive pedometers, resistance bands, and the National Institute of Aging (NIA) exercise guide. They will further receive counseling from peer health coaches, social support from group education sessions, and supplemental educational materials. After the 12 weeks of prescribed, supervised exercise sessions, HEART-PLAY group participants will continue to receive support from peers and..."
NCT03632018 (Continued)

Clinic staff with check-in calls, feedback on pedometer goals, and twice weekly group events including walks and/or resistance band group exercise classes."

**Type of intervention:** multicomponent

**Comparator description:** participants will receive the standard of care cardiac rehabilitation, consisting of 36 sessions across 12 weeks of prescribed, supervised exercise sessions.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Physical activity, HRQoL, cost-effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting date</td>
<td>August 2018</td>
</tr>
<tr>
<td>Contact information</td>
<td>NR</td>
</tr>
<tr>
<td>Notes</td>
<td>—</td>
</tr>
</tbody>
</table>

NCT03734887

**Study name**

Social engagement strategies to improve medication adherence

**Methods**

**Study design:** RCT

**Number of centres:** multicentre (number NR)

**Country:** USA

**Maximum follow-up:** 12 weeks

**Participants**

**Inclusion Criteria:**

- Age > 50 years
- Non-adherence to a statin or antihypertensive medication in the preceding 3 months
- Access to a phone with text messaging capabilities, Bluetooth connections and Internet access.
- At least one loved-one or friend with whom adherence feedback can be shared
- Ability to speak English or Spanish

**Exclusion Criteria:**

- Any recorded A1c values of > 6.5%
- ICD-9 billing codes of 250.xx
- Use of any antiglycaemic medication
- Current or past participation in the diabetes prevention programme prior to providing informed consent

**Interventions**

**Intervention description:**

Social network intervention:

Investigators will provide each patient with a smart pill bottle to sync medication use data with their phones and provide real-time data about adherence to study staff. Participants will receive the same treatment as the Private Feedback arm, but they will additionally have Social Network Feedback. A biweekly feedback text messages will be sent to both the participant and a designated loved-one or friend of the participants for 12 weeks.

**Type of intervention:** social support only

**Comparator description:**

Private feedback:
### NCT03734887

**Participants**
Participants will receive a smart pill bottle that will collect data on their medication usage and provide real-time data about adherence to study staff. Study staff will provide participants with private feedback about adherence in the form of meeting with a pharmacist.

**Outcomes**
HRQoL, physical activity, depressive symptoms, smoking behaviour, social support

**Starting date**
October 2019

**Contact information**
Miguel A Cuevas
macuevas@mednet.ucla.edu

**Notes**
—

### NCT04165421

**Study name**
Family Focused Intervention for Patients With Atrial Fibrillation (AFFINE)

**Methods**

<table>
<thead>
<tr>
<th>Study design: RCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centres: NR</td>
</tr>
<tr>
<td>Country: Denmark</td>
</tr>
<tr>
<td>Maximum follow-up: 6 months</td>
</tr>
</tbody>
</table>

**Participants**

<table>
<thead>
<tr>
<th>Inclusion criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men and women &gt; 18 years old with newly diagnosed AF (&lt; 6 months since diagnosis) documented in the patient file and verified by an EKG</td>
</tr>
<tr>
<td>Family members must be &gt; 18 years old and defined by the patient: e.g. spouse, son, daughter, near friend or neighbour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclusion criteria:</th>
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</thead>
<tbody>
<tr>
<td>Patients with chronic heart failure according to international guidelines</td>
</tr>
<tr>
<td>Patients not cable to co-operate about the project.</td>
</tr>
</tbody>
</table>

**Interventions**

<table>
<thead>
<tr>
<th>Intervention description:</th>
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</thead>
<tbody>
<tr>
<td>&quot;The intervention starts with a two hour group session for AF-patients and family members designed by the PhD student and the project nurses based on clinical guidelines of AF-management and theory from multifamily group intervention. Project nurses who are also Nurse specialists will facilitate knowledge to patients and family members about AF and how to support self-management in their daily living. Furthermore the (Family focused nursing) FFN intervention will consist of 3-5 Family Strength Orientated Therapeutic Conversations (FAM-SOTC) accordingly to the needs of patient and the family. The FAM-SOTC conversations will be used as health promoting conversations and a way to enhance family health and psychological resilience&quot;.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of intervention:</th>
</tr>
</thead>
<tbody>
<tr>
<td>social support only</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparator description:</th>
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</thead>
<tbody>
<tr>
<td>the control group will receive conventional care and treatment according to guidelines</td>
</tr>
</tbody>
</table>

Conventional care is characterised by ad hoc management as per usual standards of clinical care (with access to routine medical care, hospital care, and pharmacotherapy)

**Outcomes**
HRQoL, psychological well-being, perceived social support, hospital admissions

**Starting date**
January 2020
### NCT04165421

**Contact information**

Stine M Rosenstrøm  
stine.maria.rosenstroem@regionh.dk

**Notes**

—

### NCT04304872

#### Study name

Improving Physical Activity and Cardiac Rehabilitation Attendance Using Technology and Behavioral Economics (IMPACT-CR)

#### Methods

- **Study design:** RCT
- **Number of centres:** NR
- **Country:** USA
- **Maximum follow-up:** 12 weeks

#### Participants

**Inclusion criteria:**

- Age greater than 18
- Ability to consent
- Patients with diagnosis of stable angina, chronic systolic heart failure, post-percutaneous coronary intervention, post-coronary artery bypass grafting surgery, post-acute myocardial infarction, and post-valvular repair who were discharged after an inpatient admission within the last 12 months
- Smartphone or tablet compatible with application for the wearable activity tracking device
- Independence Blue Cross health insurance coverage

**Exclusion criteria:**

- Conditions that would make participation infeasible such as inability to provide informed consent, illiteracy or inability to speak, read, and write English
- Already enrolled in another study targeting physical activity
- Medical condition preventing participation in a physical activity programme
- Prior or ongoing enrolment in cardiac rehabilitation
- Baseline step count > 7500 steps per day

#### Interventions

**Intervention description:**

"Gamification intervention:

Participants sign a pledge agreeing to try their best to meet their goals.

Participants are entered into a game. Each week they receive 70 points. Each day, they are told their step count and points. If the step goal was met they keep their points, but if not, they lose 10 points. At the end of the week if they have at least 40 points they move up a level, but if not, they drop a level. Participants start in the middle of 5 levels.

Participants choose a support partner who receives a weekly email with the participant’s progress. The study group will hold a 3-way phone call with the participant and supportive sponsor to discuss ways they can help the participant meet their goal. At 6 weeks, the study group will have a follow up call if the participant is stuck in a lower level and restart them back at the middle level.

Gamification and loss-framed financial incentive intervention:

Participants receive both of the interventions described in the Gamification Intervention arm and the Financial Incentive Intervention arm."

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**Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)**

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**NCT04304872 (Continued)**

**Type of intervention:** social support only

**Comparator description:**

"Loss-framed financial incentive intervention:

Participants are informed that each week that $14 is placed in a virtual account for them. Each day, the participant is informed of their step count on the prior day. If the step goal was achieved, the balance remains. Each day the goal is not achieved, the participant is informed that $2 was taken away."

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Physical activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting date</td>
<td>August 2021</td>
</tr>
<tr>
<td>Contact information</td>
<td>Tory Harrington <a href="mailto:toryh@pennmedicine.upenn.edu">toryh@pennmedicine.upenn.edu</a></td>
</tr>
<tr>
<td>Notes</td>
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</tr>
</tbody>
</table>

**NCT04737759**

**Study name**

Taking Care of Us: a dyadic intervention for heart failure couples (TCU)

**Methods**

**Study design:** RCT

**Number of centres:** NR

**Country:** USA

**Maximum follow-up:** 5 months

**Participants**

**Inclusion criteria:**

- Diagnosis of heart failure for at least 3 months
- Current heart failure symptoms (i.e. NYHA Class II-III; AHA/ACC Stage C)
- Age greater than or equal to 18 years
- Willing and able to provide informed consent
- Reachable by telephone/email
- Access to device with camera (e.g. computer, tablet) to participate in Zoom sessions
- Have a co-residing spouse/unmarried partner willing to participate

Inclusion criteria: spouses/partners:

- Age greater than or equal to 18 years
- Co-residing with the adult with heart failure at time of recruitment
- Have lived with the adult with heart failure for at least 1 year
- Willing and able to provide informed consent

**Exclusion criteria:**

- Major and uncorrected hearing impairment
- Significant cognitive impairment
- Heart transplantation/mechanical circulatory support prior to enrolment
- Concomitant terminal illness that would impede participation
- Active psychosis or severe substance abuse that would impair the ability to complete the study
- Inability to complete the requirements of the study, including enrolment in an additional trial
Interventions

**Intervention description:** "Taking Care of Us involves seven sessions delivered via Zoom to couples over approximately two months. Sessions last approximately 45-60 minutes and are delivered by a trained interventionist. The program is a communication-based, relationship-focused intervention that is strengths-based and fosters new skills to support couples managing heart failure. The goals of the program are to 1) target the couple with heart failure as a team; 2) increase shared appraisal within the couple; 3) improve communication skills within the couple; 4) improve collaboration within the couple and dyadic management of heart failure; 5) improve confidence within the couple; and 6) improve both individual and dyadic health and well-being."

**Type of intervention:** social support only

**Comparator description:** active comparator – SUPPORT:

"The SUPPORT program involves three sessions delivered via Zoom to couples over approximately two months. Sessions last approximately 45-60 minutes and are delivered by a trained interventionist. This arm is an educational intervention to support management of heart failure."

### Outcomes

- HRQoL, psychological well-being, hospitalisations (healthcare utilisation)

### Starting date

- July 2021

### Contact information

- Karen S Lyons
  - karen.lyons@bc.edu

### Notes

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**Study name**

- Improving cardiac rehabilitation outcomes through mobile case management (iCARE)

**Methods**

- **Study design:** RCT (3 arms)
- **Number of centres:** single centre
- **Country:** USA
- **Maximum follow-up:** 1 year

**Participants**

- **Inclusion criteria:**
  - Own or have reliable access to a smartphone or desktop computer with Internet access
  - Have an email address
  - Non-surgical patients who have a history of one of the following: acute myocardial infarction/acute coronary syndrome, stable angina pectoris, percutaneous coronary intervention, or heart failure.

- **Exclusion criteria:**
  - Patients referred to cardiac rehabilitation following coronary artery bypass surgery, heart valve

**Interventions**

- **Intervention description:** conventional centre-based cardiac rehabilitation + mHealth (CON+):

  "Participants will be prescribed 36 sessions of center-based CR In addition, participants will be provided access to the mHealth platform which provides "e-Learning modules" with factsheets, videos, quizzes, and questionnaires (coinciding with activities being conducted during the CON program), a Social Network Module will allow patients to communicate via secure network with other patients who are part of their invited network. The Social Network Module also allows for secure two-way interaction with healthcare providers in the event that patients are experiencing signs or symptoms suggestive of worsening condition. This platform also contains a Personal
Health Record Module allowing patients to upload, archive, and retrieve personal health data (e.g. fitness tracker data, heart rate monitor data, blood pressure recordings, etc.) and record vital signs, symptoms, treatments, and medical history.

Home-based cardiac rehab + mHealth (HOM+):

"Participants will be provided paper copies of educational content at the time of event/discharge. In addition, these participants will be provided access to the same mHealth platform as the CON + group. Participants in this group will be encouraged to exercise three days per week while also completing the additional questionnaires and educational content provided by the mHealth platform in accordance with the CR program. Participation will be tracked using web/internet analytics."

**Type of intervention:** multicomponent

**Comparator description:** conventional centre-based cardiac rehabilitation (CON):

"Participants will be prescribed 36 sessions of center-based CR. This includes supervised exercise sessions, cooking demonstrations, didactic lectures, video presentations, group support, and stress management education. During sessions, participants have direct access to the medical director, case manager, registered nurse, exercise physiologist, and stress management specialists."

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Hospital admission, HRQoL, blood lipids, physical activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting date</td>
<td>July 2021</td>
</tr>
<tr>
<td>Contact information</td>
<td>Thomas P Olson <a href="mailto:olson.thomas2@mayo.edu">olson.thomas2@mayo.edu</a></td>
</tr>
</tbody>
</table>

**Siegmund 2017**

**Study name** Feasibility of a Facebook intervention for exercise motivation and cardiac rehabilitation adherence: study protocol

**Methods**

- **Study design:** RCT
- **Number of centres:** 1
- **Country:** USA
- **Maximum follow-up:** 12 weeks

**Participants**

- **Inclusion criteria:** will include both men and women 18 years of age or older who speak English and live within 100 miles of the main campus of this tertiary care centre. Participants must be able to read and understand English in order to complete the consent form, the Psychological Need Satisfaction in Exercise (PNSE) scale, and the Behavioral Regulation in Exercise Questionnaire-3 (BREQ-3).
- **Exclusion criteria:** there will be no exclusion based on secondary diagnosis; however, participants must be able to exercise well enough to qualify to take part in cardiac rehabilitation

**Interventions**

- **Intervention description:** "The Facebook intervention will include peer support, education, provider support, and text message prompts when new posts are added. These interventions are designed to minimize pressure, offer choices, and allow for peer interaction, positive feedback, guidance, and direction in order to provide support for competence, autonomy, and relatedness."
Educational posts will cover 12 topics that will encourage participants to practice preventive heart care while offering a variety of suggestions and encouragement for making personal health care choices.

Provider posts will include topics such as motivational quotes, encouragement, reminders to exercise independently, and reminders to contact providers with questions.

Peer interaction on Facebook will be as frequent as the participant freely chooses and will be monitored daily by the research team for appropriateness of content.

Both groups will have the opportunity for weekly education classes and typical peer interactions, which will involve up to 3 hours of group cardiac rehabilitation per week."

**Type of intervention:** social support and education

**Comparator description:** the comparison group will receive the same educational and provider support materials as the Facebook group, but will receive it in the form of a handout or via email in the event the patient cannot be contacted or misses cardiac rehabilitation on a particular week.

**Outcomes**

No outcomes of relevance to this review measured

**Starting date**

February 2017

**Contact information**

siegmul@ccf.org

**Notes**

—
The interactive and experiential learning platform provides all intervention group participants access to comprehensive health information regarding CHD.

In the tele-care platform, the nurse will retrieve self-monitoring data uploaded by participants and anonymously share goal attainment of group members as well as discuss their experiences and address any concerns.°

**Type of intervention:** multicomponent

**Comparator description:** participants in both groups will receive the usual healthcare information related to maintaining a healthy lifestyle (exercise, diet and smoking cessation), instructions on medication during hospitalisation, and 1 follow-up call. The research nurse will instruct control group participants on use of the pedometer.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Physical activity, smoking, interpersonal support, HRQoL, psychological well-being, blood pressure, hospital admissions, revascularisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting date</td>
<td>NR</td>
</tr>
<tr>
<td>Contact information</td>
<td><a href="mailto:sujj@link.cuhk.edu.hk">sujj@link.cuhk.edu.hk</a></td>
</tr>
<tr>
<td>Notes</td>
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</tbody>
</table>

### TCTR20200416002

**Study name**

The effect of peer group education on outcomes of the elderly patients with coronary artery disease

**Methods**

**Study design:** RCT

**Number of centres:** 1

**Country:** Iran

**Maximum follow-up:** 10 days

**Participants**

**Inclusion criteria:** age 60 to 85 years old. The absence of known psychological illness and the lack of use of psychiatric drugs, according to the patient. Suffering from coronary artery disease. Not having any cognitive, speech, or hearing disorder. Not having pain during training. The desire and ability to take care of yourself and adherence to treatment. Having complete satisfaction to participate in the study, along with informed consent form.

**Exclusion criteria:** if any of the samples are exposed to critical conditions during the study. Critical conditions include chest pain, physical problems such as headache, dizziness, nausea, vomiting, haemodynamic problems, such as any changes in blood pressure. Mental problems and any other conditions that lead to non-co-operation. Patients who do not have the desire and willingness to participate in the study during the study.

**Interventions**

**Intervention description:** in the test group, volunteers with a history of coronary artery disease will be taught to other patients with coronary artery disease as a peer group. Training is carried out through a peer group for 3 consecutive half-hour sessions in groups with 4 to 5 participants. The intervals between sessions are 1 day. The content of the training includes prescription drugs, diets (foods tailored to the condition of the disease), and patient activities (how to do daily activities).

**Type of intervention:** social support only

**Comparator description:** the control group receives routine care and training. In this way, patients with coronary artery disease at the time of referral to the hospital will be given a brief explanation about how to use drugs, lifestyle, and daily activities for 10 minutes by nurses.
### Study name

**Group Medical Visits in Heart Failure (MEDIC-HF)**

### Methods

**Study design:** RCT  
**Number of centres:** 3  
**Country:** USA  
**Maximum follow-up:** 6 months

### Participants

**Inclusion criteria:**
- 18 years and older  
- Within 12 weeks of discharge from a hospitalisation with a principal diagnosis of HF  
- Able to participate in a group setting  
- Able to read and understand questionnaires and health information and able to sign informed consent

**Exclusion criteria:**
- Unable to attend the group sessions due to either psychiatric instability (acutely suicidal, psychotic) or organic brain injury (e.g. severe dementia, encephalopathy) that precludes self-reporting on health status  
- Discharged to hospice or nursing home facilities for long-term care, or patients with a code status of comfort-measures-only  
- Recipients of heart transplant or ventricular assist devices, patients receiving intravenous inotropic infusions, pregnant women, and patients with end-stage liver disease or renal disease on dialysis

### Interventions

**Intervention description:**

"Patients will participate in four HF-SMA (shared medical appointment) visits, which are 2 weeks apart. The HF-SMA team provides interdisciplinary, individualized longitudinal care and can include a dietitian, a health psychologist, a nurse, a nurse practitioner and/or a clinical pharmacist with specialized heart failure training; one of which will lead the group discussions (facilitator). Each group is composed of 4–6 patients and their caregivers (if applicable) are encouraged to attend. The Group Education (15–30 min) consists of theme-based discussion based on curriculum published by the HF Society of America into 4 sessions:

1. Taking control of HF and self-care  
2. How to follow a low sodium diet  
3. HF medications  
4. Managing feelings about HF and advanced care planning.

This is followed by a Patient-initiated guided discussion about HF self-care barriers (15–30 min) and then end with individual break-out sessions (45–60 min) to address individual concerns if any."
Wu 2018 (Continued)

Type of intervention: multicomponent

Comparator description: all patients will receive standard of care in HF as dictated by their cardiology physicians and primary care providers

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>HRQoL, hospitalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting date</td>
<td>2015</td>
</tr>
<tr>
<td>Contact information</td>
<td><a href="mailto:Wen-Chih.Wu@va.gov">Wen-Chih.Wu@va.gov</a></td>
</tr>
<tr>
<td>Notes</td>
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</tbody>
</table>

AHA: American Heart Association
ACC: American College of Cardiology
CHD: coronary heart disease
COPD: chronic obstructive pulmonary disease
CR: cardiac rehabilitation
CVD: cardiovascular disease
EKG: electrocardiogram
HRQoL: health-related quality of life
MI: myocardial infarction
NR: not reported
NYHA: New York Heart Association

RISK OF BIAS

Legend: 🟢 Low risk of bias ✗ High risk of bias 🌅 Some concerns

Risk of bias for analysis 1.2 All-cause mortality (> 12 months follow-up)

<table>
<thead>
<tr>
<th>Study</th>
<th>Randomisation process</th>
<th>Deviations from intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>🟢</td>
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<td>🟢</td>
<td>🅵</td>
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</tr>
</tbody>
</table>
### Risk of bias for analysis 1.4 Cardiovascular-related mortality (> 12 months follow-up)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Study</th>
<th>Randomisation process</th>
<th>Deviations from intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
<th>Overall</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>Nahlen-Bose 2016</td>
<td>✔</td>
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</tr>
</tbody>
</table>

### Risk of bias for analysis 1.6 All-cause hospital admission (number of participants with at least one event, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Study</th>
<th>Randomisation process</th>
<th>Deviations from intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liljeroos 2012</td>
<td>✔</td>
<td>❓</td>
<td>✔</td>
<td>✔</td>
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</tr>
<tr>
<td></td>
<td>Nahlen-Bose 2016</td>
<td>✔</td>
<td>❓</td>
<td>✔</td>
<td>✔</td>
<td>❓</td>
<td>❓</td>
</tr>
</tbody>
</table>

### Risk of bias for analysis 1.8 Cardiovascular-related hospital admission (number of participants with at least one event, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Bias</th>
<th>Study</th>
<th>Randomisation process</th>
<th>Deviations from intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Berkman 2003</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>❓</td>
<td>❓</td>
</tr>
<tr>
<td></td>
<td>Nahlen-Bose 2016</td>
<td>✔</td>
<td>❓</td>
<td>✔</td>
<td>✔</td>
<td>❓</td>
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</tbody>
</table>
### Risk of bias for analysis 1.10 HRQoL - SF-36 (component scores, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Study</th>
<th>Randomisation process</th>
<th>Deviations from intended interventions</th>
<th>Missing outcome data</th>
<th>Measurement of the outcome</th>
<th>Selection of the reported results</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subgroup 1.10.1 Physical component score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>✔️</td>
<td>~</td>
<td>✗</td>
<td>✔️</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>✔️</td>
<td>✔️</td>
<td>✗</td>
<td>✔️</td>
<td>~</td>
<td>✗</td>
</tr>
<tr>
<td><strong>Subgroup 1.10.2 Mental component score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>✔️</td>
<td>~</td>
<td>✗</td>
<td>✔️</td>
<td>✗</td>
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</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>✔️</td>
<td>✔️</td>
<td>✗</td>
<td>✔️</td>
<td>~</td>
<td>✗</td>
</tr>
</tbody>
</table>

### Data and analyses

**Comparison 1. Social network intervention vs comparator**

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 All-cause mortality (≤ 12 months follow-up)</td>
<td>17</td>
<td>3746</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.90 [0.74, 1.09]</td>
</tr>
<tr>
<td>1.2 All-cause mortality (&gt; 12 months follow-up)</td>
<td>6</td>
<td>3093</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.75 [0.49, 1.13]</td>
</tr>
<tr>
<td>1.3 Cardiovascular-related mortality (≤ 12 months follow-up)</td>
<td>2</td>
<td>332</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.76 [0.16, 3.60]</td>
</tr>
<tr>
<td>1.4 Cardiovascular-related mortality (&gt; 12 months follow-up)</td>
<td>2</td>
<td>2583</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.85 [0.66, 1.10]</td>
</tr>
<tr>
<td>1.5 All-cause hospital admission (number of participants with at least one event, ≤ 12 months follow-up)</td>
<td>8</td>
<td>2747</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.90 [0.75, 1.09]</td>
</tr>
<tr>
<td>1.6 All-cause hospital admission (number of participants with at least one event, &gt; 12 months follow-up)</td>
<td>2</td>
<td>258</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>1.03 [0.86, 1.22]</td>
</tr>
<tr>
<td>1.7 Cardiovascular-related hospital admission (number of participants with at least one event, ≤ 12 month follow-up)</td>
<td>2</td>
<td>1504</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.54 [0.07, 4.00]</td>
</tr>
<tr>
<td>Outcome or subgroup title</td>
<td>No. of studies</td>
<td>No. of participants</td>
<td>Statistical method</td>
<td>Effect size</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1.8 Cardiovascular-related hospital admission (number of participants with at least one event, &gt; 12 months follow-up)</td>
<td>2</td>
<td>2583</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.92 [0.77, 1.10]</td>
</tr>
<tr>
<td>1.9 HRQoL - SF-36 (component scores, ≤ 12 months follow-up)</td>
<td>9</td>
<td></td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>1.9.1 Physical component score</td>
<td>9</td>
<td>2671</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>8.16 [-8.15, 24.46]</td>
</tr>
<tr>
<td>1.9.2 Mental component score</td>
<td>9</td>
<td>2671</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>5.79 [-13.14, 24.71]</td>
</tr>
<tr>
<td>1.10 HRQoL - SF-36 (component scores, &gt; 12 months follow-up)</td>
<td>2</td>
<td></td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>1.10.1 Physical component score</td>
<td>2</td>
<td>166</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>31.53 [-28.65, 91.71]</td>
</tr>
<tr>
<td>1.10.2 Mental component score</td>
<td>2</td>
<td>166</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>30.62 [-33.88, 95.13]</td>
</tr>
<tr>
<td>1.11 HRQoL - SF-36 (domain scores, longest follow-up)</td>
<td>4</td>
<td></td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>1.11.1 Physical functioning (longest follow-up)</td>
<td>4</td>
<td>855</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-0.07 [-3.00, 2.86]</td>
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<tr>
<td>1.11.2 Role-physical (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.49 [-12.60, 9.62]</td>
</tr>
<tr>
<td>1.11.3 Bodily pain (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>1.13 [-7.21, 9.47]</td>
</tr>
<tr>
<td>1.11.4 General health (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>3.41 [-2.55, 9.37]</td>
</tr>
<tr>
<td>1.11.5 Mental health (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-2.57 [-8.44, 3.30]</td>
</tr>
<tr>
<td>1.11.6 Role-emotional (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-4.05 [-15.10, 7.01]</td>
</tr>
<tr>
<td>1.11.7 Social functioning (longest follow-up)</td>
<td>2</td>
<td>191</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.99 [-10.16, 6.19]</td>
</tr>
<tr>
<td>1.11.8 Vitality (longest follow-up)</td>
<td>3</td>
<td>821</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>1.59 [-1.38, 4.57]</td>
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<tr>
<td>1.12 HRQoL - MLHFQ (≤ 12 months follow-up)</td>
<td>5</td>
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<td>Mean Difference (IV, Random, 95% CI)</td>
<td></td>
</tr>
<tr>
<td>1.12.1 Total</td>
<td>5</td>
<td>608</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-4.33 [-7.18, -1.48]</td>
</tr>
<tr>
<td>Outcome or subgroup title</td>
<td>No. of studies</td>
<td>No. of participants</td>
<td>Statistical method</td>
<td>Effect size</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-------------</td>
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<tr>
<td>1.12.2 Physical</td>
<td>4</td>
<td>511</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.53 [-2.92, -0.15]</td>
</tr>
<tr>
<td>1.12.3 Emotional</td>
<td>4</td>
<td>511</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-0.93 [-1.78, -0.08]</td>
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<tr>
<td>1.13 HRQoL - KCCQ (≤ 12 months follow-up)</td>
<td>4</td>
<td>511</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>Subtotals only</td>
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<tr>
<td>1.13.1 Overall summary score</td>
<td>4</td>
<td>716</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>4.17 [-2.75, 11.09]</td>
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<tr>
<td>1.13.2 Symptom stability score</td>
<td>2</td>
<td>343</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>3.63 [-5.97, 13.23]</td>
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<tr>
<td>1.14 Psychological well-being - HADS (≤ 12 months follow-up)</td>
<td>7</td>
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<td>Mean Difference (IV, Random, 95% CI)</td>
<td>Subtotals only</td>
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<tr>
<td>1.14.1 Anxiety</td>
<td>7</td>
<td>1087</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-0.63 [-1.48, 0.22]</td>
</tr>
<tr>
<td>1.14.2 Depression</td>
<td>5</td>
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<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-0.05 [-0.79, 0.68]</td>
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<tr>
<td>1.15 Psychological well-being - BDI/BDI-II (longest follow-up)</td>
<td>4</td>
<td>2095</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.75 [-3.64, 0.13]</td>
</tr>
<tr>
<td>1.16 Psychological well-being - PHQ-9 (≤ 12 months follow-up)</td>
<td>2</td>
<td>127</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-0.49 [-3.57, 2.58]</td>
</tr>
<tr>
<td>1.17 Psychological well-being - State anxiety (≤ 12 months follow-up)</td>
<td>3</td>
<td>186</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-8.47 [-18.65, 1.71]</td>
</tr>
<tr>
<td>1.18 Blood pressure (longest follow-up)</td>
<td>4</td>
<td></td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>Subtotals only</td>
</tr>
<tr>
<td>1.18.1 Systolic blood pressure</td>
<td>4</td>
<td>991</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-2.99 [-5.70, -0.27]</td>
</tr>
<tr>
<td>1.18.2 Diastolic blood pressure</td>
<td>4</td>
<td>991</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.64 [-3.23, -0.06]</td>
</tr>
<tr>
<td>1.19 Total cholesterol (longest follow-up)</td>
<td>5</td>
<td>166</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-18.70 [-50.17, 12.77]</td>
</tr>
<tr>
<td>1.20 LDL cholesterol (longest follow-up)</td>
<td>5</td>
<td>227</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-9.88 [-33.47, 13.70]</td>
</tr>
<tr>
<td>1.21 HDL cholesterol (longest follow-up)</td>
<td>5</td>
<td>166</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>-1.72 [-6.29, 2.85]</td>
</tr>
<tr>
<td>1.22 Myocardial infarction (number of participants with at least one event, longest follow-up)</td>
<td>2</td>
<td>2697</td>
<td>Risk Ratio (M-H, Random, 95% CI)</td>
<td>0.99 [0.81, 1.20]</td>
</tr>
</tbody>
</table>
1.23 Social support and connectedness - ESSI (longest follow-up)

<table>
<thead>
<tr>
<th>Outcome or subgroup title</th>
<th>No. of studies</th>
<th>No. of participants</th>
<th>Statistical method</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support and connectedness - ESSI (longest follow-up)</td>
<td>3</td>
<td>1889</td>
<td>Mean Difference (IV, Random, 95% CI)</td>
<td>1.55 [0.30, 2.81]</td>
</tr>
</tbody>
</table>

Analysis 1.1. Comparison 1: Social network intervention vs comparator, Outcome 1: All-cause mortality (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clark 2000</td>
<td>11</td>
<td>7</td>
<td>1.33 [0.53, 3.39]</td>
<td></td>
</tr>
<tr>
<td>Colella 2018</td>
<td>1</td>
<td>7</td>
<td>6.04 [0.25, 146.44]</td>
<td></td>
</tr>
<tr>
<td>Consette 2016</td>
<td>0</td>
<td>2</td>
<td>0.20 [0.01, 3.86]</td>
<td></td>
</tr>
<tr>
<td>Dalal 2019</td>
<td>4</td>
<td>4</td>
<td>1.02 [0.26, 3.97]</td>
<td></td>
</tr>
<tr>
<td>Dekk 2017</td>
<td>9</td>
<td>130</td>
<td>0.40 [0.23, 1.04]</td>
<td></td>
</tr>
<tr>
<td>Dunbar 2013 (1)</td>
<td>1</td>
<td>27</td>
<td>0.36 [0.03, 3.82]</td>
<td></td>
</tr>
<tr>
<td>Dunbar 2013 (2)</td>
<td>4</td>
<td>26</td>
<td>1.76 [0.21, 15.01]</td>
<td></td>
</tr>
<tr>
<td>Dunn 2013 (3)</td>
<td>1</td>
<td>7</td>
<td>2.67 [0.13, 56.63]</td>
<td></td>
</tr>
<tr>
<td>Gortner 1988</td>
<td>2</td>
<td>38</td>
<td>0.62 [0.11, 3.50]</td>
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</tr>
<tr>
<td>Heisler 2013</td>
<td>18</td>
<td>131</td>
<td>1.16 [0.61, 2.21]</td>
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</tr>
<tr>
<td>Horlick 1984</td>
<td>6</td>
<td>33</td>
<td>2.30 [0.30, 19.06]</td>
<td></td>
</tr>
<tr>
<td>Pschke 2008</td>
<td>1</td>
<td>20</td>
<td>2.17 [0.09, 50.74]</td>
<td></td>
</tr>
<tr>
<td>Powell 2008</td>
<td>93</td>
<td>451</td>
<td>0.91 [0.71, 1.17]</td>
<td></td>
</tr>
<tr>
<td>Shahriari 2013</td>
<td>2</td>
<td>36</td>
<td>1.00 [0.15, 6.72]</td>
<td></td>
</tr>
<tr>
<td>Smeulders 2010</td>
<td>18</td>
<td>131</td>
<td>1.06 [0.53, 2.12]</td>
<td></td>
</tr>
<tr>
<td>Srisuk 2017</td>
<td>2</td>
<td>50</td>
<td>0.67 [0.12, 3.82]</td>
<td></td>
</tr>
<tr>
<td>Vellone 2020 (4)</td>
<td>7</td>
<td>178</td>
<td>0.54 [0.22, 1.33]</td>
<td></td>
</tr>
<tr>
<td>Yeh 2016</td>
<td>0</td>
<td>50</td>
<td>0.14 [0.01, 2.70]</td>
<td></td>
</tr>
</tbody>
</table>

Total (95% CI) 1937 1809 100.0% 0.90 [0.74, 1.09]

Heterogeneity: $I^2 = 0.00$; $I^2 = 12.07$, df = 17 ($P = 0.80$); $P = 0.00$

Test for subgroup differences: Not applicable

Footnotes
(1) Family partnership intervention arm
(2) Patient family education arm
(3) Intervention arm 2 (motivational social support from a nurse with social support from significant other). Arm 1 had 0 events in both arms so was not entered into meta-analysis
(4) Intervention arm 2 (motivational interviewing for patients and caregivers). Arm 1 not included as was not an eligible social support intervention.
### Analysis 1.2. Comparison 1: Social network intervention vs comparator, Outcome 2: All-cause mortality (> 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention Events</th>
<th>Comparator Events</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>168</td>
<td>1235</td>
<td>43.8%</td>
<td>0.98 [0.81, 1.20]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>12</td>
<td>71</td>
<td>84</td>
<td>0.65 [0.34, 1.21]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td>Nahleen-Bose 2016</td>
<td>5</td>
<td>52</td>
<td>4</td>
<td>1.23 [0.35, 4.31]</td>
<td></td>
<td>![Yellow]</td>
</tr>
<tr>
<td>Orth-Gomer 2009</td>
<td>8</td>
<td>112</td>
<td>25</td>
<td>0.36 [0.17, 0.76]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td>Pischke 2008</td>
<td>2</td>
<td>28</td>
<td>1</td>
<td>1.43 [0.14, 14.70]</td>
<td></td>
<td>![Yellow]</td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>1</td>
<td>35</td>
<td>2</td>
<td>0.50 [0.05, 5.27]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>196</td>
<td>1560</td>
<td>100.0%</td>
<td>0.75 [0.49, 1.13]</td>
<td></td>
<td>![Green]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.09; Chi² = 8.28, df = 5 (P = 0.14); I² = 40%
Test for overall effect: Z = 1.37 (P = 0.17)
Test for subgroup differences: Not applicable

### Risk of bias legend
(A) Bias arising from the randomization process
(B) Bias due to deviations from intended interventions
(C) Bias due to missing outcome data
(D) Bias in measurement of the outcome
(E) Bias in selection of the reported result
(F) Overall bias

### Analysis 1.3. Comparison 1: Social network intervention vs comparator, Outcome 3: Cardiovascular-related mortality (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention Events</th>
<th>Comparator Events</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalal 2019</td>
<td>1</td>
<td>107</td>
<td>47.9%</td>
<td>0.34 [0.04, 3.21]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td>Horlick 1984</td>
<td>4</td>
<td>83</td>
<td>3</td>
<td>1.59 [0.18, 13.71]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>190</td>
<td>142</td>
<td>100.0%</td>
<td>0.76 [0.16, 3.60]</td>
<td></td>
<td>![Green]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.00; Chi² = 0.28, df = 1 (P = 0.63); I² = 0%
Test for overall effect: Z = 0.35 (P = 0.73)
Test for subgroup differences: Not applicable

### Analysis 1.4. Comparison 1: Social network intervention vs comparator, Outcome 4: Cardiovascular-related mortality (> 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention Events</th>
<th>Comparator Events</th>
<th>Weight</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
<th>Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>96</td>
<td>1235</td>
<td>98.8%</td>
<td>0.84 [0.65, 1.09]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td>Nahleen-Bose 2016</td>
<td>2</td>
<td>52</td>
<td>1</td>
<td>1.96 [0.18, 20.97]</td>
<td></td>
<td>![Green]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>1287</td>
<td>1296</td>
<td>100.0%</td>
<td>0.85 [0.66, 1.10]</td>
<td></td>
<td>![Green]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.00; Chi² = 0.48, df = 1 (P = 0.50); I² = 0%
Test for overall effect: Z = 1.24 (P = 0.22)
Test for subgroup differences: Not applicable

### Risk of bias legend
(A) Bias arising from the randomization process
(B) Bias due to deviations from intended interventions
(C) Bias due to missing outcome data
(D) Bias in measurement of the outcome
(E) Bias in selection of the reported result
(F) Overall bias

---

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### Analysis 1.5. Comparison 1: Social network intervention vs comparator, Outcome 5: All-cause hospital admission (number of participants with at least one event, ≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Colella 2018</td>
<td>0</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Cossette 2016</td>
<td>2</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Dalal 2019</td>
<td>19</td>
<td>107</td>
<td>24</td>
</tr>
<tr>
<td>Deek 2017</td>
<td>10</td>
<td>113</td>
<td>20</td>
</tr>
<tr>
<td>Heisler 2013</td>
<td>65</td>
<td>135</td>
<td>67</td>
</tr>
<tr>
<td>Lang 2018</td>
<td>4</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Vellone 2020 (1)</td>
<td>30</td>
<td>177</td>
<td>20</td>
</tr>
<tr>
<td>Volpp 2017</td>
<td>279</td>
<td>975</td>
<td>151</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td></td>
<td>1598</td>
<td>1149</td>
</tr>
</tbody>
</table>

**Footnotes**
(1) Intervention arm 2 (motivational interview for patients and caregivers)

### Analysis 1.6. Comparison 1: Social network intervention vs comparator, Outcome 6: All-cause hospital admission (number of participants with at least one event, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>51</td>
<td>71</td>
<td>58</td>
</tr>
<tr>
<td>Nahlen-Bose 2016</td>
<td>28</td>
<td>52</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td></td>
<td>123</td>
<td>135</td>
</tr>
</tbody>
</table>

**Risk of Bias Legend**
- A: Bias arising from the randomization process
- B: Bias due to deviations from intended interventions
- C: Bias due to missing outcome data
- D: Bias in measurement of the outcome
- E: Bias in selection of the reported result
- F: Overall bias

### Analysis 1.7. Comparison 1: Social network intervention vs comparator, Outcome 7: Cardiovascular-related hospital admission (number of participants with at least one event, ≤ 12 month follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Events</td>
</tr>
<tr>
<td>Lang 2018</td>
<td>0</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Volpp 2017</td>
<td>82</td>
<td>975</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td></td>
<td>1000</td>
<td>504</td>
</tr>
</tbody>
</table>

**Footnotes**
(1) Intervention arm 2 (motivational interview for patients and caregivers)
Analysis 1.8. Comparison 1: Social network intervention vs comparator, Outcome 8: Cardiovascular-related hospital admission (number of participants with at least one event, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio</th>
<th>Risk of Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>442</td>
<td>1235</td>
<td>92%</td>
<td>0.95 (0.86, 1.06)</td>
</tr>
<tr>
<td>Nah hen-Bose 2016</td>
<td>16</td>
<td>52</td>
<td>8%</td>
<td>0.71 (0.43, 1.19)</td>
</tr>
</tbody>
</table>

Total (95% CI): 1287/1296 (100.0%) 0.92 (0.77, 1.10)

- Total events: 458/489
- Heterogeneity: Tau² = 0.01; Chi² = 1.18, df = 1 (P = 0.28); I² = 15%
- Test for overall effect: Z = 0.87 (P = 0.39)
- Test for subgroup differences: Not applicable

Risk of bias legend
- (A) Bias arising from the randomization process
- (B) Bias due to deviations from intended interventions
- (C) Bias due to missing outcome data
- (D) Bias in measurement of the outcome
- (E) Bias in selection of the reported result
- (F) Overall bias

Analysis 1.9. Comparison 1: Social network intervention vs comparator, Outcome 9: HRQoL - SF-36 (component scores, ≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003 (1)</td>
<td>38.6 11.479537</td>
<td>38.6 11.479537</td>
<td>0.80 [0.45, 2.05]</td>
<td></td>
</tr>
<tr>
<td>Carroll 2006 (2)</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-3.00 [-13.83, 11.83]</td>
<td></td>
</tr>
<tr>
<td>Deek 2017</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.20 [-13.45, 1.05]</td>
<td></td>
</tr>
<tr>
<td>Liljeros 2012</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.39 [-11.50, 11.72]</td>
<td></td>
</tr>
<tr>
<td>Pavy 2009</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.40 [-13.75, 11.55]</td>
<td></td>
</tr>
<tr>
<td>Smeulers 2010</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.41 [-11.75, 11.56]</td>
<td></td>
</tr>
<tr>
<td>Srisuk 2017</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.39 [-11.50, 11.72]</td>
<td></td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.40 [-13.75, 11.55]</td>
<td></td>
</tr>
<tr>
<td>Vellone 2020 (3)</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.40 [-13.75, 11.55]</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>1363 100.0%</td>
<td>1363 100.0%</td>
<td>5.79 [13.14, 24.71]</td>
<td></td>
</tr>
</tbody>
</table>

- Heterogeneity: Tau² = 0.17; Chi² = 4209.99, df = 8 (P < 0.00001); I² = 100%
- Test for overall effect: Z = 0.98 (P = 0.33)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003 (1)</td>
<td>38.6 11.479537</td>
<td>38.6 11.479537</td>
<td>2.10 [1.05, 3.10]</td>
<td></td>
</tr>
<tr>
<td>Carroll 2006 (2)</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>0.40 [-5.35, 13.35]</td>
<td></td>
</tr>
<tr>
<td>Deek 2017</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.60 [-3.84, 2.64]</td>
<td></td>
</tr>
<tr>
<td>Liljeros 2012</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.33 [-3.97, 3.31]</td>
<td></td>
</tr>
<tr>
<td>Pavy 2009</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-1.00 [-3.56, 1.56]</td>
<td></td>
</tr>
<tr>
<td>Smeulers 2010</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-1.00 [-3.56, 1.56]</td>
<td></td>
</tr>
<tr>
<td>Srisuk 2017</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.39 [-11.50, 11.72]</td>
<td></td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.40 [-13.75, 11.55]</td>
<td></td>
</tr>
<tr>
<td>Vellone 2020 (3)</td>
<td>37.2 11.479537</td>
<td>37.2 11.479537</td>
<td>-0.40 [-13.75, 11.55]</td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>1363 100.0%</td>
<td>1363 100.0%</td>
<td>5.79 [13.14, 24.71]</td>
<td></td>
</tr>
</tbody>
</table>

- Heterogeneity: Tau² = 0.84; Chi² = 4245.73, df = 8 (P = 0.00001); I² = 100%
- Test for overall effect: Z = 0.60 (P = 0.55)

Footnotes
1. SD estimated from between-group difference 95% CI - subgroup study
2. Arm 1 (peer advice)
3. Arm 2 (institutional interview for participants and caregivers)
4. SD estimated from between-group difference 95% CI - subgroup study

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# Analysis 1.10. Comparison 1: Social network intervention vs comparator, Outcome 10: HRQoL - SF-36 (component scores, > 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td>1.10.1 Physical component score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>28.13</td>
<td>11.5</td>
<td>44</td>
<td>38.34</td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>85.2</td>
<td>4.7</td>
<td>35</td>
<td>23</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>79</td>
<td>87</td>
<td>100.0%</td>
<td>31.53 [-28.65, 91.71]</td>
</tr>
<tr>
<td>Heterogeneity: Tau² = 1882.02; Chi² = 527.26, df = 1 (P &lt; 0.00001); I² = 100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 1.03 (P = 0.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 1.10.2 Mental component score | | | | | | | |
| Liljeroos 2012    | 46.49 | 11.97 | 44 | 48.81 | 11.5 | 52 | 49.9% | -2.32 [-7.40, 2.46] |
| Vahedian-Azimi 2016 | 83.9 | 3.8 | 35 | 29.4 | 5.5 | 35 | 50.1% | 63.50 [61.29, 65.71] |
| Subtotal (95% CI) | 79 | 87 | 100.0% | 30.62 [-33.88, 95.13] |
| Heterogeneity: Tau² = 2162.60; Chi² = 612.20, df = 1 (P < 0.00001); I² = 100% | | | |
| Test for overall effect: Z = 0.93 (P = 0.35) | | | |

**Risk of bias legend**
(A) Bias arising from the randomization process  
(B) Bias due to deviations from intended interventions  
(C) Bias due to missing outcome data  
(D) Bias in measurement of the outcome  
(E) Bias in selection of the reported result  
(F) Overall bias
Analysis 1.11. Comparison 1: Social network intervention vs comparator, Outcome 11: HRQoL - SF-36 (domain scores, longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention Mean</th>
<th>Social network intervention SD</th>
<th>Social network intervention Total</th>
<th>Comparator Mean</th>
<th>Comparator SD</th>
<th>Comparator Total</th>
<th>Mean Difference IV, Random, 95% CI</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.11.1 Physical functioning (longest follow-up)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>61.2</td>
<td>28.18</td>
<td>44</td>
<td>59.58</td>
<td>26.73</td>
<td>52</td>
<td>7.0%</td>
<td>1.62 [-9.43, 12.67]</td>
</tr>
<tr>
<td>Macken 2014 (1)</td>
<td>80</td>
<td>16.702</td>
<td>17</td>
<td>82.5</td>
<td>16.702</td>
<td>17</td>
<td>6.8%</td>
<td>-2.50 [-13.73, 8.73]</td>
</tr>
<tr>
<td>Pary 2009</td>
<td>22.6</td>
<td>33.9</td>
<td>45</td>
<td>14.9</td>
<td>30.3</td>
<td>50</td>
<td>5.1%</td>
<td>7.70 [-5.29, 20.69]</td>
</tr>
<tr>
<td>Powell 2008</td>
<td>-2</td>
<td>21.2</td>
<td>316</td>
<td>-1.5</td>
<td>20.5</td>
<td>314</td>
<td>81.0%</td>
<td>-0.50 [-3.76, 2.76]</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>422</td>
</tr>
<tr>
<td>Footnotes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) Mean and SD estimated from median (range) using Wan 2014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for overall effect: Z = 0.05 (P = 0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **1.11.2 Role-physical (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 46.31 | 44.29 | 44 | 48.84 | 43.32 | 52 | 39.8% | -2.53 [-20.13, 15.07] |
| Pary 2009 | 14 | 36.3 | 45 | 14.8 | 34.7 | 50 | 60.2% | -0.80 [-15.12, 13.52] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 0.26 (P = 0.79) |

| **1.11.3 Bodily pain (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 66.4 | 27.45 | 44 | 65.25 | 28.02 | 52 | 56.2% | 1.15 [-9.98, 12.28] |
| Pary 2009 | 8.6 | 26.9 | 45 | 7.5 | 35.5 | 50 | 43.8% | 1.10 [-11.49, 13.69] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 0.27 (P = 0.79) |

| **1.11.4 General health (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 56.09 | 23.56 | 44 | 54.68 | 21.63 | 52 | 42.7% | 1.41 [-7.70, 10.52] |
| Pary 2009 | 7.7 | 20.2 | 45 | 2.8 | 18.8 | 50 | 57.3% | -4.90 [-2.97, 12.77] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 1.12 (P = 0.26) |

| **1.11.5 Mental health (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 71.73 | 21.82 | 44 | 75.33 | 20.03 | 52 | 48.4% | -3.60 [-12.04, 4.84] |
| Pary 2009 | 12 | 19.6 | 45 | 13.6 | 21 | 50 | 51.6% | -1.60 [-9.77, 6.57] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 0.27 (P = 0.79) |

| **1.11.6 Role-emotional (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 64.02 | 42.65 | 44 | 68 | 39.05 | 52 | 45.0% | -3.98 [-20.46, 12.50] |
| Pary 2009 | 12 | 39.6 | 45 | 16.1 | 33.9 | 50 | 55.0% | -4.10 [-19.01, 10.81] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 0.72 (P = 0.47) |

| **1.11.7 Social functioning (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 76.4 | 25.66 | 44 | 81.5 | 22.02 | 52 | 64.2% | -5.10 [-14.76, 4.56] |
| Pary 2009 | 23.6 | 34.6 | 45 | 20 | 31 | 50 | 35.8% | 3.60 [-6.87, 16.67] |
| **Subtotal (95% CI)** | | | | | | | | 102 |
| Test for overall effect: Z = 0.48 (P = 0.63) |

| **1.11.8 Vitality (longest follow-up)** | | | | | | | | |
| Liljeroos 2012 | 55.66 | 24.66 | 44 | 56.47 | 23 | 52 | 9.6% | -0.81 [-10.41, 8.79] |
| Pary 2009 | 11.8 | 22.8 | 45 | 12.6 | 29.8 | 50 | 7.8% | -0.80 [-11.41, 9.81] |
| Powell 2008 | 4.2 | 21.2 | 316 | 2.1 | 20.7 | 314 | 82.2% | 2.10 [-1.17, 5.37] |
| **Subtotal (95% CI)** | | | | | | | | 405 |
| Test for overall effect: Z = 1.05 (P = 0.29) |

Test for subgroup differences: Chi² = 0.00, df = 7 (P < 0.0001), P = 0%
### Analysis 1.12. Comparison 1: Social network intervention vs comparator, Outcome 12: HRQoL - MLHF (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>1.12.1 Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalal 2019</td>
<td>24.1</td>
<td>20.9</td>
<td>92</td>
<td>27.5</td>
</tr>
<tr>
<td>Heisler 2013 (1)</td>
<td>36.7</td>
<td>15.8</td>
<td>93</td>
<td>40.6</td>
</tr>
<tr>
<td>Lang 2018</td>
<td>29.2</td>
<td>25.8</td>
<td>22</td>
<td>38.7</td>
</tr>
<tr>
<td>Srisuk 2017</td>
<td>52</td>
<td>13.4</td>
<td>47</td>
<td>55</td>
</tr>
<tr>
<td>Yeh 2016 (2)</td>
<td>12</td>
<td>17.5</td>
<td>49</td>
<td>23</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>299</strong></td>
<td><strong>309</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 28.65; Chi² = 2.41, df = 1 (P = 0.12); I² = 58%

Test for overall effect: Z = 0.74 (P = 0.46)

---

### Analysis 1.13. Comparison 1: Social network intervention vs comparator, Outcome 13: HRQoL - KCCQ (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td><strong>1.13.1 Overall summary score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dickson 2015</td>
<td>79.1</td>
<td>16</td>
<td>29</td>
<td>66.5</td>
</tr>
<tr>
<td>Peohle 2014</td>
<td>75.1</td>
<td>21.5</td>
<td>88</td>
<td>74.7</td>
</tr>
<tr>
<td>Smeulders 2010</td>
<td>66.9</td>
<td>22.1</td>
<td>186</td>
<td>69.6</td>
</tr>
<tr>
<td>Vellone 2020</td>
<td>13.4</td>
<td>22.3</td>
<td>89</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>392</strong></td>
<td><strong>324</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 37.41; Chi² = 13.37, df = 3 (P = 0.004); I² = 78%

Test for overall effect: Z = 1.18 (P = 0.24)

---

### Analysis 1.13.2 Symptom stability score

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td>Peohle 2014</td>
<td>75.2</td>
<td>24</td>
<td>88</td>
<td>75.8</td>
</tr>
<tr>
<td>Vellone 2020</td>
<td>14.6</td>
<td>37.5</td>
<td>89</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>177</strong></td>
<td><strong>166</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 28.65; Chi² = 2.41, df = 1 (P = 0.12); I² = 58%

Test for overall effect: Z = 0.74 (P = 0.46)
Analysis 1.14. Comparison 1: Social network intervention vs comparator, Outcome 14: Psychological well-being - HADS (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td>Boese 2013</td>
<td>25.12</td>
<td>6.49</td>
<td>41</td>
<td>25.7</td>
</tr>
<tr>
<td>Dalal 2019</td>
<td>4.2</td>
<td>3.8</td>
<td>88</td>
<td>4.7</td>
</tr>
<tr>
<td>Lang 2018</td>
<td>5.5</td>
<td>5.1</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>Nahles-Bose 2016</td>
<td>4.17</td>
<td>3.72</td>
<td>36</td>
<td>4.77</td>
</tr>
<tr>
<td>Snoeders 2010</td>
<td>5.9</td>
<td>4.5</td>
<td>186</td>
<td>5.2</td>
</tr>
<tr>
<td>Turner 2014</td>
<td>6.93</td>
<td>3.38</td>
<td>14</td>
<td>10.04</td>
</tr>
<tr>
<td>Vellone 2020 (1)</td>
<td>-1.73</td>
<td>4.36</td>
<td>177</td>
<td>-0.43</td>
</tr>
<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td>563</td>
<td>524</td>
<td>100.0%</td>
<td>-0.63 [-1.48, 0.22]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 4.20$; Chi² = 6.76, df = 1 (P = 0.009); I² = 85%

Test for overall effect: $Z = 0.31$ (P = 0.75)

Test for subgroup differences: Not applicable

Footnotes
(1) Arm 2 (motivational interview for patients and caregivers)

Analysis 1.15. Comparison 1: Social network intervention vs comparator, Outcome 15: Psychological well-being - BDI/BDI-II (longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>8.2</td>
<td>8.3</td>
<td>916</td>
<td>11</td>
</tr>
<tr>
<td>Colella 2012</td>
<td>3.96</td>
<td>3.72</td>
<td>61</td>
<td>4.43</td>
</tr>
<tr>
<td>Liljeroos 2012</td>
<td>9.43</td>
<td>9.72</td>
<td>44</td>
<td>9.71</td>
</tr>
<tr>
<td>Turner 2014</td>
<td>11.95</td>
<td>7.87</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>1035</td>
<td>1060</td>
<td>100.0%</td>
<td>-1.75 [-3.64, 0.13]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 2.12$; Chi² = 11.16, df = 3 (P = 0.001); I² = 73%

Test for overall effect: $Z = 1.82$ (P = 0.07)

Test for subgroup differences: Not applicable

Footnotes
(1) Arm 2 (motivational interview for patients and caregivers)

Analysis 1.16. Comparison 1: Social network intervention vs comparator, Outcome 16: Psychological well-being - PHQ-9 (≤ 12 months follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boese 2013</td>
<td>11.58</td>
<td>4.56</td>
<td>43</td>
<td>10.44</td>
</tr>
<tr>
<td>Mackers 2014 (1)</td>
<td>1.5</td>
<td>1.135</td>
<td>17</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td>60</td>
<td>67</td>
<td>100.0%</td>
<td>-0.49 [-3.57, 2.58]</td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 4.20$; Chi² = 6.76, df = 1 (P = 0.009); I² = 85%

Test for overall effect: $Z = 0.31$ (P = 0.75)

Test for subgroup differences: Not applicable

Footnotes
(1) Mean and SD estimated from median (IQR) using Wan 2014
Analysis 1.17. **Comparison 1: Social network intervention vs comparator, Outcome 17: Psychological well-being - State anxiety (≤ 12 months follow-up)**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohammadpourhokhi 2019</td>
<td>44.36 3.89</td>
<td>30 45.93 8.02</td>
<td>-1.57 [-4.76, 1.62]</td>
</tr>
<tr>
<td>Parent 2000</td>
<td>25.3 5.4</td>
<td>27 31.4 8.6</td>
<td>-6.10 [-9.83, -2.37]</td>
</tr>
<tr>
<td>Vahedian-Azimi 2016</td>
<td>54.69 6.43</td>
<td>35 72.31 5.1</td>
<td>-17.62 [-20.34, -14.90]</td>
</tr>
</tbody>
</table>

**Total (95% CI):** 92 94 100.0% -8.47 [-18.65, 1.71]  

Heterogeneity: Tau² = 0.00; Chi² = 0.33, df = 3 (P = 0.95); I² = 0%  
Test for overall effect: Z = 2.03 (P = 0.04)  
Test for subgroup differences: Not applicable  
Favours social network intervention

Analysis 1.18. **Comparison 1: Social network intervention vs comparator, Outcome 18: Blood pressure (longest follow-up)**

### 1.18.1 Systolic blood pressure

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pischke 2008</td>
<td>126.4 17.44</td>
<td>20 128.8 17.42</td>
<td>-2.40 [-14.08, 9.27]</td>
</tr>
<tr>
<td>Powell 2000</td>
<td>-1.6 21.21</td>
<td>1 17.29 45.1</td>
<td>-6.90 [-5.47, 0.27]</td>
</tr>
<tr>
<td>Toobert 1998</td>
<td>135.14</td>
<td>14 147.28</td>
<td>-12.00 [-32.18, 8.16]</td>
</tr>
<tr>
<td>Turner 2014</td>
<td>123.54 20</td>
<td>14 133.43 22.13</td>
<td>-9.99 [-25.24, 5.40]</td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 499 492 100.0% -2.59 [-5.79, -0.27]  
Heterogeneity: Tau² = 0.00; Chi² = 0.62, df = 3 (P = 0.65); I² = 0%  
Test for overall effect: Z = 2.16 (P = 0.03)  
Test for subgroup differences: Not applicable  
Favours social network intervention

### 1.18.2 Diastolic blood pressure

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pischke 2008</td>
<td>77.03 8.91</td>
<td>20 75.07 31.56</td>
<td>-1.96 [-14.49, 11.41]</td>
</tr>
<tr>
<td>Powell 2000</td>
<td>-1.3 12.11</td>
<td>14 0.3 45.1</td>
<td>-1.30 [-3.24, 0.64]</td>
</tr>
<tr>
<td>Toobert 1998</td>
<td>64.15</td>
<td>14 67.15</td>
<td>-3.00 [-7.85, 1.85]</td>
</tr>
<tr>
<td>Turner 2014</td>
<td>72.29 12.61</td>
<td>14 57.29 45.98</td>
<td>-2.91 [-11.06, 5.05]</td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 499 492 100.0% -1.64 [-3.21, 0.66]  
Heterogeneity: Tau² = 0.00; Chi² = 0.33, df = 3 (P = 0.65); I² = 0%  
Test for overall effect: Z = 2.03 (P = 0.04)  
Test for subgroup differences: Not applicable  
Favours social network intervention

Analysis 1.19. **Comparison 1: Social network intervention vs comparator, Outcome 19: Total cholesterol (longest follow-up)**

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakan 2008</td>
<td>179.1 30.71</td>
<td>21 189.32 40.41</td>
<td>-10.22 [-34.23, 13.79]</td>
</tr>
<tr>
<td>Macken 2014 (1)</td>
<td>-22.5 57.34</td>
<td>17 34.5 42.59</td>
<td>12.00 [-21.95, 46.95]</td>
</tr>
<tr>
<td>Pischke 2008</td>
<td>162.9 37.56</td>
<td>20 244.3 56.93</td>
<td>-81.40 [-114.58, -48.22]</td>
</tr>
<tr>
<td>Toobert 1998</td>
<td>-22.4 32.14</td>
<td>14 213.63 61.11</td>
<td>-11.00 [-20.61, 51.81]</td>
</tr>
<tr>
<td>Turner 2014 (2)</td>
<td>143.47 33.26</td>
<td>14 165.89 51.04</td>
<td>-22.42 [-43.58, -11.24]</td>
</tr>
</tbody>
</table>

Subtotal (95% CI): 86 80 100.0% -18.78 [-38.17, 11.77]  
Heterogeneity: Tau² = 10.01; Chi² = 19.42, df = 4 (P = 0.0016); I² = 59%  
Test for overall effect: Z = 1.16 (P = 0.24)  
Test for subgroup differences: Not applicable  
Favours social network intervention

Footnotes  
(1) Mean and SD estimated from median and range using Wan 2014  
(2) Data converted from mmol/L to mg/dL.

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### Analysis 1.20. Comparison 1: Social network intervention vs comparator, Outcome 20: LDL cholesterol (longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI [mg/dL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakan 2008</td>
<td>128.71 27.05 21</td>
<td>135.41 32.83 22</td>
<td>-6.70 [-24.65, 11.25]</td>
</tr>
<tr>
<td>Macken 2014 (1)</td>
<td>-18.75 47.60 17</td>
<td>-32.25 40.05 17</td>
<td>11.50 [-16.08, 43.08]</td>
</tr>
<tr>
<td>Pischke 2008</td>
<td>86.56 42.82799 20</td>
<td>164.13 57.51383 15</td>
<td>-77.57 [12.02, -102.11]</td>
</tr>
<tr>
<td>Reddy 2017 (2)</td>
<td>-4.6 32.790194 54</td>
<td>-0.14 30.515619 36</td>
<td>3.54 [-8.72, 17.80]</td>
</tr>
<tr>
<td>Toobert 1998</td>
<td>137 9 14</td>
<td>131 51 11</td>
<td>6.00 [-25.74, 37.74]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>126</strong></td>
<td><strong>101</strong> 100%</td>
<td><strong>-0.88 [-33.47, 13.70]</strong></td>
</tr>
</tbody>
</table>

**Footnotes**
(1) Mean and SD estimated from median and range using Wan 2014
(2) Intervention arm 2 only (feedback + partner), as intervention arm 1 (individual feedback) not eligible for this review

### Analysis 1.21. Comparison 1: Social network intervention vs comparator, Outcome 21: HDL cholesterol (longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference IV, Random, 95% CI [mg/dL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakan 2008</td>
<td>41.81 4.4 21</td>
<td>-40.73 5.85 22</td>
<td>1.08 [-2.00, 4.16]</td>
</tr>
<tr>
<td>Macken 2014 (1)</td>
<td>2 0.551 17</td>
<td>1.5 6.859 17</td>
<td>0.50 [-4.67, 5.67]</td>
</tr>
<tr>
<td>Reddy 2017 (2)</td>
<td>43 13 14</td>
<td>40 9 11</td>
<td>5.00 [-5.64, 11.64]</td>
</tr>
<tr>
<td>Turner 2014 (2)</td>
<td>88 100%</td>
<td>88 100%</td>
<td>-0.72 [-4.29, 2.85]</td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>86</strong></td>
<td><strong>88</strong> 100%</td>
<td><strong>0.01</strong></td>
</tr>
</tbody>
</table>

**Footnotes**
(1) Mean and SD estimated from median and range using Wan 2014
(2) Data converted from mmol/L to mg/dL

### Analysis 1.22. Comparison 1: Social network intervention vs comparator, Outcome 22: Myocardial infarction (number of participants with at least one event, longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Risk Ratio M-H, Random, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkman 2003</td>
<td>168 1238 170 1243 99.6%</td>
<td>0.99 [0.81, 1.21]</td>
<td></td>
</tr>
<tr>
<td>Deek 2017</td>
<td>0 113 1 103 0.4%</td>
<td>0.30 [0.01, 7.38]</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95% CI)</strong></td>
<td><strong>1351</strong></td>
<td><strong>1346</strong> 100%</td>
<td><strong>0.99 [0.81, 1.20]</strong></td>
</tr>
</tbody>
</table>

**Footnotes**
Total events: 168 171

---

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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Analysis 1.23. Comparison 1: Social network intervention vs comparator, Outcome 23: Social support and connectedness - ESSI (longest follow-up)

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Social network intervention</th>
<th>Comparator</th>
<th>Mean Difference</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social network intervention</td>
<td>Mean</td>
<td>SD</td>
<td>Total</td>
<td>Mean</td>
</tr>
<tr>
<td>Asbury 2011</td>
<td>18.2</td>
<td>4.6</td>
<td>23</td>
<td>17.37</td>
</tr>
<tr>
<td>Berkman 2003</td>
<td>26.3</td>
<td>6.2</td>
<td>929</td>
<td>25</td>
</tr>
<tr>
<td>Turner 2014</td>
<td>20.79</td>
<td>4.04</td>
<td>14</td>
<td>24.6</td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>966</td>
<td>923</td>
<td>100.0%</td>
<td>1.55 [0.30, 2.81]</td>
</tr>
</tbody>
</table>

Heterogeneity: Tau² = 0.47; Chi² = 2.68, df = 2 (P = 0.26); I² = 25%
Test for overall effect: Z = 2.42 (P = 0.02)
Test for subgroup differences: Not applicable

Table 1. Summary of HRQoL data

<table>
<thead>
<tr>
<th>Measure of HRQoL</th>
<th>Mean (SD) outcome values at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Asbury 2011:

SF-36 at 6 months follow-up

- Physical functioning: NR = NR, NS = Intervention = Control
- Physical role limitation: NR = NR, NS = Intervention = Control
- Emotion role limitation: NR = NR, NS = Intervention = Control
- Energy: NR = NR, NS = Intervention = Control
- Well-being: NR = NR, NS = Intervention = Control
- Social functioning: NR = NR, NS = Intervention = Control
- Pain: NR = NR, NS = Intervention = Control
- General health: NR = NR, NS = Intervention = Control

SF-36 at 12 months follow-up

- Physical functioning: NR = NR, NS = Intervention = Control
- Physical role limitation: NR = NR, NS = Intervention = Control
- Emotion role limitation: NR = NR, NS = Intervention = Control
- Energy: NR = NR, NS = Intervention = Control
- Well-being: NR = NR, NS = Intervention = Control
- Social functioning: NR = NR, NS = Intervention = Control
- Pain: NR = NR, NS = Intervention = Control
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<th>Table 1. Summary of HRQoL data  (Continued)</th>
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<td>MLHFQ at 12 weeks follow-up</td>
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<tr>
<td>Total score</td>
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<tr>
<td>Physical score</td>
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<td><strong>Berkman 2003 b:</strong></td>
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<td>SF-12 at 6 months follow-up</td>
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<tr>
<td>Physical component score</td>
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<td><strong>Boese 2013:</strong></td>
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<td>WHOQOL-BREF at 6 months follow-up</td>
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<td>Overall subscale</td>
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<tr>
<td>Physical subscale</td>
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<td><strong>Carroll 2006 d:</strong></td>
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<tr>
<td>Physical component score</td>
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<td>Mental component score</td>
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<td><strong>Dalal 2019:</strong></td>
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<td>MLHFQ at 4 months follow-up</td>
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<tr>
<td>Total score</td>
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<td>MLHFQ at 6 months follow-up</td>
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### Table 1. Summary of HRQoL data (Continued)

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<td><strong>Emotional score</strong></td>
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<td>6.8 (6.8)</td>
<td>0.53*</td>
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<tr>
<td><strong>MLHFQ at 12 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total score</td>
<td>24.1 (20.9)</td>
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<td>14.5 (11.8)</td>
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<td>5.5 (6.4)</td>
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<tr>
<td><strong>HeartQOL at 4 months follow-up</strong></td>
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<tr>
<td>Global score</td>
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<td><strong>HeartQOL at 6 months follow-up</strong></td>
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<td></td>
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<tr>
<td>Global score</td>
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<td>1.8 (0.8)</td>
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<td>Intervention = Control</td>
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<td>1.7 (0.9)</td>
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<td>2.2 (0.8)</td>
<td>2.1 (0.8)</td>
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<tr>
<td><strong>HeartQOL at 12 months follow-up</strong></td>
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<td></td>
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<tr>
<td>Global score</td>
<td>1.9 (0.8)</td>
<td>1.9 (0.9)</td>
<td>0.82**</td>
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<td>1.7 (0.9)</td>
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<td>2.3 (0.8)</td>
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<td><strong>EQ-5D-3L at 4 months follow-up</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>EQ-5D-3L index score</td>
<td>0.758 (0.223)</td>
<td>0.753 (0.223)</td>
<td>0.88*</td>
<td>Intervention = Control</td>
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<td><strong>EQ-5D-3L at 6 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EQ-5D-3L index score</td>
<td>0.708 (0.265)</td>
<td>0.733 (0.217)</td>
<td>0.49*</td>
<td>Intervention = Control</td>
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<td><strong>EQ-5D-3L at 12 months follow-up</strong></td>
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<tr>
<td>EQ-5D-3L index score</td>
<td>0.752 (0.240)</td>
<td>0.739 (0.263)</td>
<td>0.49**</td>
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<tr>
<td><strong>EQ-5D-VAS at 4 months follow-up</strong></td>
<td></td>
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<tr>
<td>EQ-5D-VAS</td>
<td>73 (17)</td>
<td>74 (17)</td>
<td>0.69*</td>
<td>Intervention = Control</td>
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<td><strong>EQ-5D-VAS at 4 months follow-up</strong></td>
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Table 1. Summary of HRQoL data (Continued)

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<thead>
<tr>
<th>Source</th>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Significant Difference</th>
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<tr>
<td></td>
<td>EQ-5D-VAS at 4 months follow-up</td>
<td>74 (18)</td>
<td>73 (22)</td>
<td>0.86**</td>
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<tr>
<td></td>
<td>SF-12 at 30 days follow-up</td>
<td>Physical component score 37.21 (4.70)</td>
<td>37.40 (4.70)</td>
<td>0.77</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
<td></td>
<td>Mental component score 53.99 (12.60)</td>
<td>54.61 (11.70)</td>
<td>0.25</td>
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<tr>
<td></td>
<td>KCCQ at 1 month follow-up</td>
<td>Overall summary score 83.4 (13)</td>
<td>64.3 (24)</td>
<td>0.22</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
<td></td>
<td>Clinical summary score 84.5 (14)</td>
<td>69.8 (31)</td>
<td>0.98</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
<td>KCCQ at 3 months follow-up</td>
<td>Overall summary score 79.1 (16)</td>
<td>66.5 (23)</td>
<td>0.22</td>
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<td>Clinical summary score 84.5 (13)</td>
<td>70.3 (30)</td>
<td>0.98</td>
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<tr>
<td></td>
<td>McNew's quality of life questionnaire at 30 days follow-up</td>
<td>Overall score 156.13 (14.08)</td>
<td>136.4 (27.41)</td>
<td>&lt;0.001</td>
<td>Intervention &gt; Control</td>
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<tr>
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<td>Emotional function score 66 (9)</td>
<td>58.78 (14.62)</td>
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<td></td>
<td></td>
<td>Physical function score 58.6 (7.81)</td>
<td>50.26 (11.53)</td>
<td>0.001</td>
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<td></td>
<td>Social function score 31.52 (3.97)</td>
<td>27.35 (5.47)</td>
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<td></td>
<td>Heisler 2013: MLHFQ at 6 months follow-up</td>
<td>Total score 36.7 (NR)</td>
<td>40.6 (NR)</td>
<td>NS</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
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<td>Physical score 17.1 (NR)</td>
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<tr>
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<td></td>
<td>Emotional score 7.8 (NR)</td>
<td>8.6 (NR)</td>
<td>NS</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
<td>Lang 2018: MLHFQ at 4 months follow-up</td>
<td>Total score 35.5 (28.3)</td>
<td>37.8 (27.9)</td>
<td>0.79*</td>
<td>Intervention = Control</td>
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Table 1. Summary of HRQoL data (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Physical score</th>
<th>Emotional score</th>
<th>t-value</th>
<th>P-value</th>
<th>Intervention</th>
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<tbody>
<tr>
<td>MLHFQ at 6 months follow-up</td>
<td>19.4 (13.5)</td>
<td>8.0 (8.5)</td>
<td>0.74</td>
<td>0.67</td>
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<td>20.7 (12.8)</td>
<td>9.1 (8.6)</td>
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HeartQOL at 4 months follow-up

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<th>Physical score</th>
<th>Emotional score</th>
<th>t-value</th>
<th>P-value</th>
<th>Intervention</th>
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<tbody>
<tr>
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<td>1.5 (1.0)</td>
<td>1.3 (1.0)</td>
<td>2.0 (1.0)</td>
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<td>Intervention = Control</td>
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HeartQOL at 6 months follow-up

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<th>Physical score</th>
<th>Emotional score</th>
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<th>P-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.8 (0.8)</td>
<td>1.6 (0.8)</td>
<td>2.2 (1.0)</td>
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<td></td>
<td>Intervention = Control</td>
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EQ-5D-3L at 4 months follow-up

|                      | EQ-5D-3L index score | 0.60 (0.28)       | 0.52 (0.34)       | 0.39    | Intervention = Control |

EQ-5D-3L at 6 months follow-up

|                      | EQ-5D-3L index score | 0.65 (0.31)       | 0.55 (0.29)       | 0.28    | Intervention = Control |

Lenz 2000:

COOP charts - functional health status at 2 weeks follow-up

<table>
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<tr>
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<th>Overall</th>
<th>Physical</th>
<th>Emotional</th>
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<th>P-value</th>
<th>Intervention</th>
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<tbody>
<tr>
<td></td>
<td>21.26 (NR)</td>
<td>9.68 (NR)</td>
<td>6.26 (NR)</td>
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<td>Intervention = Control</td>
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COOP charts - functional health status at 4 weeks follow-up

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Physical</th>
<th>Emotional</th>
<th>t-value</th>
<th>P-value</th>
<th>Intervention</th>
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<tr>
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<td>22.11 (NR)</td>
<td>9.74 (NR)</td>
<td>6.32 (NR)</td>
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### Table 1. Summary of HRQoL data (Continued)

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<td>17.42 (NR)</td>
<td>17.00 (NR)</td>
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</tr>
<tr>
<td>Physical</td>
<td>8.05 (NR)</td>
<td>7.00 (NR)</td>
<td>NS</td>
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<tr>
<td>Emotional</td>
<td>4.68 (NR)</td>
<td>4.79 (NR)</td>
<td>NS</td>
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**COOP charts - functional health status at 12 weeks follow-up**

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<th></th>
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<th>Emotional</th>
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<td>14.84 (NR)</td>
<td>15.31 (NR)</td>
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<td>Physical</td>
<td>5.74 (NR)</td>
<td>5.33 (NR)</td>
<td>NS</td>
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<tr>
<td>Emotional</td>
<td>4.00 (NR)</td>
<td>4.26 (NR)</td>
<td>NS</td>
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**Liljeroos 2012:**

**SF-36 at 3 months follow-up (data are Δ (SD))**

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<tr>
<td>Mental component score</td>
<td>-1.9 (9.8)</td>
<td>-0.5 (7.9)</td>
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**SF-36 at 12 months follow-up (data are Δ (SD))**

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<thead>
<tr>
<th></th>
<th>Physical component score</th>
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<tr>
<td>Physical</td>
<td>0.3 (8.8)</td>
<td>-3.1 (12.5)</td>
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<td>Mental component score</td>
<td>-4.55 (11.2)</td>
<td>-4.22 (11.9)</td>
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**SF-36 at 24 months follow-up (data are Δ (SD))**

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<th>Physical component score</th>
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<td>Physical</td>
<td>-2.67 (0.93)</td>
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<tr>
<td>Mental component score</td>
<td>2.56 (1.20)</td>
<td>3.49 (1.10)</td>
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**Macken 2014:**

**SF-36 at post-intervention follow-up (data are median (range))**

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<th>Physical function</th>
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<td>Physical</td>
<td>85 (50 to 100)</td>
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<tr>
<td>Social function</td>
<td>1.40 (2.36)</td>
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<tr>
<td>Role-emotional</td>
<td>7.66 (4.32)</td>
</tr>
<tr>
<td>Mental health</td>
<td>3.30 (1.89)</td>
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<td>SF-36 at 3 month follow-up</td>
<td>Physical function</td>
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**Nahlen-Bose 2016:**

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<tr>
<th>SF-36 at post-intervention follow-up</th>
<th>Physical composite score</th>
<th>241.59 (84.61)</th>
<th>218.69 (94.25)</th>
<th>0.27*</th>
<th>Intervention = Control</th>
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<tbody>
<tr>
<td></td>
<td>Mental health composite score</td>
<td>272.37 (88.32)</td>
<td>264.11 (93.77)</td>
<td>0.69*</td>
<td>Intervention = Control</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 6 weeks follow-up</th>
<th>Physical composite score</th>
<th>239.87 (88.03)</th>
<th>211.25 (102.63)</th>
<th>0.19*</th>
<th>Intervention = Control</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mental health composite score</td>
<td>265.50 (90.04)</td>
<td>259.60 (95.81)</td>
<td>0.78*</td>
<td>Intervention = Control</td>
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<table>
<thead>
<tr>
<th>SF-36 at 6 months follow-up</th>
<th>Physical composite score</th>
<th>235.61 (91.32)</th>
<th>211.11 (96.25)</th>
<th>0.25*</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental health composite score</td>
<td>271.30 (78.80)</td>
<td>259.67 (90.68)</td>
<td>0.55*</td>
<td>Intervention = Control</td>
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</table>

<table>
<thead>
<tr>
<th>SF-36 at 12 months follow-up</th>
<th>Physical composite score</th>
<th>237.80 (94.93)</th>
<th>233.59 (101.05)</th>
<th>0.85*</th>
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</thead>
<tbody>
<tr>
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<td>Mental health composite score</td>
<td>265.35 (94.72)</td>
<td>262.76 (102.00)</td>
<td>0.91*</td>
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**Parry 2009:**

<table>
<thead>
<tr>
<th>SF-36 at 9 weeks follow-up (data are Δ (SD))</th>
<th>Physical component score</th>
<th>7.2 (11.7)</th>
<th>3.2 (11.9)</th>
<th>0.12**</th>
<th>Intervention = Control</th>
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<tbody>
<tr>
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<td>Mental component score</td>
<td>5.3 (12.3)</td>
<td>8.6 (12.9)</td>
<td>0.22**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>Physical function</td>
<td>22.6 (33.9)</td>
<td>14.9 (30.3)</td>
<td>0.24**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>Role-physical</td>
<td>28.8 (37.9)</td>
<td>14.8 (34.7)</td>
<td>0.06**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>Bodily pain</td>
<td>8.6 (26.9)</td>
<td>7.5 (35.5)</td>
<td>0.88**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>General health</td>
<td>7.7 (20.2)</td>
<td>2.8 (18.8)</td>
<td>0.23**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>Vitality</td>
<td>11.8 (22.8)</td>
<td>12.6 (29.8)</td>
<td>0.88**</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td></td>
<td>Social function</td>
<td>23.6 (34.6)</td>
<td>20.0 (31.0)</td>
<td>0.59**</td>
<td>Intervention = Control</td>
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<tr>
<td></td>
<td>Role-emotional</td>
<td>12.0 (39.6)</td>
<td>16.1 (33.9)</td>
<td>0.59**</td>
<td>Intervention = Control</td>
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</tbody>
</table>
Table 1. Summary of HRQoL data (Continued)

<table>
<thead>
<tr>
<th>Mental health</th>
<th>12.0 (19.6)</th>
<th>13.6 (21.0)</th>
<th>0.70**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**Piette 2015:**

**MLHFQ at 6 months follow-up (data are Δ (95% CI))**

<table>
<thead>
<tr>
<th>MLHFQ score</th>
<th>2.66 (-1.51 to 6.82)</th>
<th>NR</th>
<th>NS**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**MLHFQ at 12 months follow-up (data are Δ (95% CI))**

<table>
<thead>
<tr>
<th>MLHFQ score</th>
<th>0.74 (-4.62 to 4.77)</th>
<th>NR</th>
<th>NS**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**Powell 2008:**

**SF-36 at 12 months follow-up (data are Δ (SD))**

<table>
<thead>
<tr>
<th>Physical function</th>
<th>-2.0 (21.2)</th>
<th>-1.5 (20.5)</th>
<th>0.76**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Vitality

<table>
<thead>
<tr>
<th>4.2 (21.2)</th>
<th>2.1 (20.7)</th>
<th>0.21**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**Quality of Life Index Cardiac Version at 12 months follow-up (data are Δ (SD))**

<table>
<thead>
<tr>
<th>Health and function</th>
<th>0.2 (0.9)</th>
<th>0.1 (0.9)</th>
<th>0.42**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Psychological/spiritual

<table>
<thead>
<tr>
<th>0.1 (0.8)</th>
<th>0.0 (0.9)</th>
<th>0.58**</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**Pozehl 2014:**

**KCCQ at 6 months:**

<table>
<thead>
<tr>
<th>Overall</th>
<th>75.6 (19.5)</th>
<th>74.6 (21.3)</th>
<th>0.74*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Physical limitation

<table>
<thead>
<tr>
<th>76.1 (22.2)</th>
<th>77.5 (21.7)</th>
<th>0.66*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Symptom score

<table>
<thead>
<tr>
<th>78.1 (18.8)</th>
<th>75.7 (23.2)</th>
<th>0.44*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Quality of life

<table>
<thead>
<tr>
<th>71.6 (24.3)</th>
<th>67.5 (26.4)</th>
<th>0.27*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Social limitation

<table>
<thead>
<tr>
<th>76.5 (24.2)</th>
<th>77.5 (22.2)</th>
<th>0.77*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**KCCQ at 12 months:**

<table>
<thead>
<tr>
<th>Overall</th>
<th>75.1 (21.5)</th>
<th>74.7 (22.6)</th>
<th>0.90*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Physical limitation

<table>
<thead>
<tr>
<th>76.4 (23.4)</th>
<th>75.3 (21.4)</th>
<th>0.74*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Symptom score

<table>
<thead>
<tr>
<th>75.2 (24.0)</th>
<th>75.8 (24.8)</th>
<th>0.87*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Quality of life

<table>
<thead>
<tr>
<th>71.6 (24.4)</th>
<th>70.4 (26.2)</th>
<th>0.75*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Social limitation

<table>
<thead>
<tr>
<th>76.9 (25.4)</th>
<th>77.1 (26.5)</th>
<th>0.96*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

**KCCQ at 18 months:**

<table>
<thead>
<tr>
<th>Overall</th>
<th>75.1 (21.5)</th>
<th>74.7 (22.6)</th>
<th>0.90*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Physical limitation

<table>
<thead>
<tr>
<th>76.4 (23.4)</th>
<th>75.3 (21.4)</th>
<th>0.74*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Symptom score

<table>
<thead>
<tr>
<th>75.2 (24.0)</th>
<th>75.8 (24.8)</th>
<th>0.87*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Quality of life

<table>
<thead>
<tr>
<th>71.6 (24.4)</th>
<th>70.4 (26.2)</th>
<th>0.75*</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

Social limitation

| 76.9 (25.4) | 77.1 (26.5) | 0.96* | Intervention = Control |
### Table 1. Summary of HRQoL data (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>77.3 (18.9)</td>
<td>73.0 (22.0)</td>
<td>0.19*</td>
<td></td>
</tr>
<tr>
<td><strong>Physical limitation</strong></td>
<td>78.3 (22.7)</td>
<td>74.1 (23.8)</td>
<td>0.26*</td>
<td></td>
</tr>
<tr>
<td><strong>Symptom score</strong></td>
<td>79.0 (19.4)</td>
<td>74.5 (23.1)</td>
<td>0.19*</td>
<td></td>
</tr>
<tr>
<td><strong>Quality of life</strong></td>
<td>74.0 (21.9)</td>
<td>68.0 (24.9)</td>
<td>0.11*</td>
<td></td>
</tr>
<tr>
<td><strong>Social limitation</strong></td>
<td>78.6 (24.6)</td>
<td>74.8 (25.7)</td>
<td>0.35*</td>
<td></td>
</tr>
</tbody>
</table>

**Smeulders 2017:**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SF-36 at post-intervention months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical component score</td>
<td>37.8 (10.6)</td>
<td>36.6 (10.6)</td>
<td>0.052</td>
<td></td>
</tr>
<tr>
<td>Mental component score</td>
<td>47.7 (11.4)</td>
<td>48.0 (11.0)</td>
<td>0.411</td>
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</tbody>
</table>

**SF-36 at 6 months follow-up**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical component score</td>
<td>37.4 (10.5)</td>
<td>37.0 (10.2)</td>
<td>0.136</td>
<td></td>
</tr>
<tr>
<td>Mental component score</td>
<td>46.9 (12.0)</td>
<td>49.4 (11.4)</td>
<td>0.161</td>
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**SF-36 at 12 months follow-up**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical component score</td>
<td>37.7 (10.2)</td>
<td>38.4 (10.0)</td>
<td>0.974</td>
<td></td>
</tr>
<tr>
<td>Mental component score</td>
<td>47.7 (11.7)</td>
<td>48.7 (11.3)</td>
<td>0.939</td>
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</table>

**KCCQ at post-intervention follow-up**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary score</td>
<td>65.7 (21.7)</td>
<td>67.1 (19.4)</td>
<td>0.005</td>
<td></td>
</tr>
</tbody>
</table>

**KCCQ at 6 months follow-up**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary score</td>
<td>64.8 (22.6)</td>
<td>68.3 (21.4)</td>
<td>0.052</td>
<td></td>
</tr>
</tbody>
</table>

**KCCQ at 12 months follow-up**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary score</td>
<td>66.9 (22.1)</td>
<td>69.6 (20.4)</td>
<td>0.118</td>
<td></td>
</tr>
</tbody>
</table>

**Srisuk 2017:**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MLHFQ at 3 months follow-up (data are mean (SE))</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50.3 (2.2)</td>
<td>53.0 (2.2)</td>
<td>0.221</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>19.3 (1.0)</td>
<td>19.3 (1.0)</td>
<td>0.991</td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>11.5 (0.7)</td>
<td>13.2 (0.7)</td>
<td>0.014</td>
<td></td>
</tr>
</tbody>
</table>

**MLHFQ at 6 month follow-up (data are mean (SE))**

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>52.0 (2.0)</td>
<td>55.0 (2.0)</td>
<td>0.139</td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Summary of HRQoL data (Continued)

|                      | Physical | Emotional |  |  |  |
|----------------------|----------|-----------|  |  |  |
|                      | 19.6 (0.9) | 20.0 (0.9) | 0.683 | Intervention = Control |
|                      | 12.1 (0.6) | 13.6 (0.6) | 0.015 | Intervention > Control |

SF-36 at 3 months follow-up (data are mean (SE))

|                      | Physical component score | 52.1 (1.5) | 49.3 (1.5) | 0.055 | Intervention = Control |
|                      | Mental component score   | 42.0 (1.1) | 41.0 (1.1) | 0.398 | Intervention = Control |

SF-36 at 6 months follow-up (data are mean (SE))

|                      | Physical component score | 52.1 (1.5) | 49.5 (1.5) | 0.085 | Intervention = Control |
|                      | Mental component score   | 41.4 (1.1) | 41.0 (1.1) | 0.714 | Intervention = Control |

Toobert 1998:

SF-36 at follow-up (time point NR) (data are Δ)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>General health</th>
<th>Social functioning</th>
<th>&quot;other 4 scales&quot;</th>
<th>&quot;other 4 scales&quot;</th>
<th>&quot;other 4 scales&quot;</th>
<th>&quot;other 4 scales&quot;</th>
<th>&quot;other 4 scales&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NR</td>
<td>4 (NR)</td>
<td>22 (NR)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>NR</td>
<td>-23 (NR)</td>
<td>-4 (NR)</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>NR</td>
<td>&lt; 0.05</td>
<td>&lt; 0.05</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

Vahedian-Azimi 2016:

SF-36 at 10 days follow-up

|                      | Physical component score | 82.05 (6.40) | 25.6 (9.44) | < 0.0001 | Intervention > Control |
|                      | Mental component score   | 80.11 (7.40) | 23.35 (8.34) | < 0.0001 | Intervention > Control |

SF-36 at 3 months follow-up

|                      | Physical component score | 82.04 (9.30) | 26.06 (8.20) | < 0.0001 | Intervention > Control |
|                      | Mental component score   | 81.21 (7.30) | 23.35 (8.34) | < 0.0001 | Intervention > Control |

SF-36 at 6 months follow-up

|                      | Physical component score | 81.01 (7.20) | 24.24 (10.24) | < 0.0001 | Intervention > Control |
|                      | Mental component score   | 79.41 (6.20) | 24.15 (7.14)  | < 0.0001 | Intervention > Control |

SF-36 at 9 months follow-up

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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### Table 1. Summary of HRQoL data (Continued)

<table>
<thead>
<tr>
<th>SF-36 at 12 months follow-up</th>
<th>Physical component score</th>
<th>86.13 (4.51)</th>
<th>27.81 (7.61)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>85.72 (3.23)</td>
<td>24.43 (7.82)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 15 months follow-up</th>
<th>Physical component score</th>
<th>88.37 (3.42)</th>
<th>20.10 (4.65)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>85.17 (3.34)</td>
<td>18.33 (4.45)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 18 months follow-up</th>
<th>Physical component score</th>
<th>88.54 (3.35)</th>
<th>22.91 (7.15)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>84.69 (3.45)</td>
<td>22.89 (7.56)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 21 months follow-up</th>
<th>Physical component score</th>
<th>87.66 (3.47)</th>
<th>27.53 (7.12)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>84.04 (3.78)</td>
<td>21.74 (5.93)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 24 months follow-up</th>
<th>Physical component score</th>
<th>81.01 (7.20)</th>
<th>34.24 (10.24)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>79.41 (6.20)</td>
<td>24.15 (7.14)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-36 at 27 months follow-up</th>
<th>Physical component score</th>
<th>85.21 (4.65)</th>
<th>23.01 (4.87)</th>
<th>&lt; 0.0001</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>83.86 (3.81)</td>
<td>20.44 (5.48)</td>
<td>&lt; 0.0001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

**Vellone 2020:**

<table>
<thead>
<tr>
<th>SF-12 at 3 months follow-up (data are Δ (SD))</th>
<th>Physical component score</th>
<th>2.15 (10.09)</th>
<th>1.12 (8.17)</th>
<th>0.29*</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>1.24 (10.11)</td>
<td>1.57 (10.78)</td>
<td>0.77*</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-12 at 6 months follow-up (data are Δ (SD))</th>
<th>Physical component score</th>
<th>2.63 (9.29)</th>
<th>1.10 (7.96)</th>
<th>0.10*</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>-0.45 (11.72)</td>
<td>-0.73 (10.64)</td>
<td>0.81*</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SF-12 at 9 months follow-up (data are Δ (SD))</th>
<th>Physical component score</th>
<th>2.63 (9.29)</th>
<th>1.10 (7.96)</th>
<th>0.10*</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mental component score</td>
<td>-0.45 (11.72)</td>
<td>-0.73 (10.64)</td>
<td>0.81*</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Table 1. Summary of HRQoL data (Continued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Physical component score</td>
<td>2.89 (9.53)</td>
<td>0.04 (8.36)</td>
<td>0.003*</td>
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<tr>
<td>Mental component score</td>
<td>4.44 (10.98)</td>
<td>2.29 (9.30)</td>
<td>0.047*</td>
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<td>SF-12 at 12 months follow-up (data are Δ (SD))</td>
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<tr>
<td>Physical component score</td>
<td>3.27 (10.72)</td>
<td>0.79 (8.67)</td>
<td>0.017**</td>
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<tr>
<td>Mental component score</td>
<td>3.35 (11.69)</td>
<td>2.61 (10.54)</td>
<td>0.53</td>
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<tr>
<td>KCCQ at 3 months follow-up (data are Δ (SD))</td>
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</tr>
<tr>
<td>Overall summary score</td>
<td>0.7 (22.9)</td>
<td>0.8 (21.5)</td>
<td>0.97*</td>
<td></td>
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</tr>
<tr>
<td>Self-efficacy score</td>
<td>1.9 (25.1)</td>
<td>-0.3 (25.8)</td>
<td>0.42*</td>
<td></td>
<td></td>
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<tr>
<td>Symptom stability score</td>
<td>2.3 (38.3)</td>
<td>-2.9 (34.8)</td>
<td>0.18*</td>
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<tr>
<td>KCCQ at 6 months follow-up (data are Δ (SD))</td>
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<tr>
<td>Overall summary score</td>
<td>7.6 (21.0)</td>
<td>3.0 (16.5)</td>
<td>0.02*</td>
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<tr>
<td>Self-efficacy score</td>
<td>10.7 (24.1)</td>
<td>4.5 (19.3)</td>
<td>0.008*</td>
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<tr>
<td>Symptom stability score</td>
<td>6.3 (35.6)</td>
<td>-4.1 (36.9)</td>
<td>0.007*</td>
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<tr>
<td>KCCQ at 9 months follow-up (data are Δ (SD))</td>
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<tr>
<td>Overall summary score</td>
<td>13.2 (20.1)</td>
<td>5.5 (17.4)</td>
<td>&lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy score</td>
<td>14.0 (20.6)</td>
<td>4.9 (19.8)</td>
<td>&lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptom stability score</td>
<td>17.0 (33.4)</td>
<td>4.7 (29.4)</td>
<td>0.0003*</td>
<td></td>
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</tr>
<tr>
<td>KCCQ at 12 months follow-up (data are Δ (SD))</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Overall summary score</td>
<td>13.4 (22.3)</td>
<td>4.1 (17.9)</td>
<td>&lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-efficacy score</td>
<td>16.3 (24.7)</td>
<td>6.1 (20.7)</td>
<td>&lt; 0.001*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yeh 2016:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLHQ at 12 weeks follow-up (data are median (Q1, Q3))</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Total score</td>
<td>9 (2, 25)</td>
<td>22 (4, 43)</td>
<td>0.02**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P value calculated by authors
**adjusted for baseline values
a Scores estimated from graph, no SDs reported.
bData from subgroup analysis (first 1296 patients).
cSix-month data only as at 12 months wait-list control patients have received intervention.
dInterception arm 1 (peer advice) only. Arm 2 excluded as not eligible for this review.
eInterception arm 2 (motivational interview for patients and caregivers) only. Arm 1 excluded as not eligible for this review.
Abbreviations:
EQ-5D-3L: three level version of five-dimension EuroQol scale  
EQ-5D-VAS: EuroQol visual analogue scale  
HRQoL: health-related quality of life  
KCCQ: Kansas City Cardiomyopathy Questionnaire  
MLHFQ: Minnesota Living with Heart Failure Questionnaire  
NR: not reported  
NS: trialists report results 'not-significant' but P value not provided  
SD: standard deviation  
SE: standard error  
VAS: visual analogue scale

**Table 2. Summary of psychological well-being data**

<table>
<thead>
<tr>
<th>Measure of psychological well-being</th>
<th>Mean (SD) outcome values at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td><strong>Antypas 2014:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HADS at 1-month follow-up (data are median (IQR))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>1 (4)</td>
<td>1 (3.2)</td>
<td>0.98</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2.5 (4.2)</td>
<td>3 (3.5)</td>
<td>0.98</td>
</tr>
<tr>
<td>HADS at 3 month follow-up (data are median (IQR))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>2 (2)</td>
<td>1.5 (2)</td>
<td>0.58</td>
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<tr>
<td>Anxiety</td>
<td>4 (4)</td>
<td>4.5 (4.7)</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>Asbury 2011:</strong></td>
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</tr>
<tr>
<td>HAQ at 6 months follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health worry</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Fear of illness</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Reassurance</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Interference</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Total</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>HAQ at 12 months follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health worry</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Fear of illness</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Reassurance</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Interference</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
<tr>
<td>Total</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
</tr>
</tbody>
</table>
### Table 2. Summary of psychological well-being data (Continued)

#### HADS at 6 months follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>NR NR NS</td>
</tr>
<tr>
<td>Depression</td>
<td>NR NR NS</td>
</tr>
<tr>
<td>Total</td>
<td>NR NR NS</td>
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</tbody>
</table>

#### HADS at 12 months follow-up

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>NR NR NS</td>
</tr>
<tr>
<td>Depression</td>
<td>NR NR NS</td>
</tr>
<tr>
<td>Total</td>
<td>NR NR NS</td>
</tr>
</tbody>
</table>

**Berkman 2003:**

#### BDI at 6 months follow-up

<table>
<thead>
<tr>
<th>Depressive symptoms</th>
<th>P &lt; 0.001**</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.2 (8.3)</td>
<td>11.0 (8.7)</td>
</tr>
</tbody>
</table>

#### HRSD at 6 months follow-up

<table>
<thead>
<tr>
<th>Depression</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.9 (6.5)</td>
<td>8.4 (6.8)</td>
</tr>
</tbody>
</table>

**Boese 2013**:

#### PHQ-9 at 6 months follow-up

<table>
<thead>
<tr>
<th>Depressive symptoms</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.58 (4.56)</td>
<td>10.44 (4.72)</td>
</tr>
</tbody>
</table>

**Clark 2000:**

#### CES-D at 4 months follow-up (data are Δ)

<table>
<thead>
<tr>
<th>Depression score</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.54 (NR)</td>
<td>0.03 (NR)</td>
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</table>

#### CES-D at 12 months follow-up (data are Δ)

<table>
<thead>
<tr>
<th>Depression score</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.21 (NR)</td>
<td>-0.24 (NR)</td>
</tr>
</tbody>
</table>

**Colella 2018:**

#### BDI-II at 6 weeks follow-up

<table>
<thead>
<tr>
<th>BDI-II Depression score</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.65 (3.85)</td>
<td>5.84 (5.3)</td>
</tr>
</tbody>
</table>

#### BDI-II at 12 weeks follow-up

<table>
<thead>
<tr>
<th>BDI-II Depression score</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.65 (3.85)</td>
<td>5.84 (5.3)</td>
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</table>
### Table 2. Summary of psychological well-being data (Continued)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Effect Size</th>
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<tr>
<td><strong>BDI-II Depression score</strong></td>
<td>3.96 (3.72)</td>
<td>4.43 (5.26)</td>
<td>0.48</td>
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<td><strong>Dalal 2019:</strong></td>
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<tr>
<td><strong>HADS at 4 months follow-up</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>4.4 (3.9)</td>
<td>5.2 (4.2)</td>
<td>0.17*</td>
<td>Intervention = Control</td>
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<tr>
<td>Depression</td>
<td>3.6 (2.7)</td>
<td>4.5 (3.5)</td>
<td>0.046*</td>
<td>Intervention &gt; Control</td>
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<tr>
<td><strong>HADS at 6 months follow-up</strong></td>
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</tr>
<tr>
<td>Anxiety</td>
<td>4.7 (3.7)</td>
<td>5.4 (4.3)</td>
<td>0.24*</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Depression</td>
<td>4.6 (3.2)</td>
<td>4.7 (3.6)</td>
<td>0.84*</td>
<td>Intervention = Control</td>
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<tr>
<td><strong>HADS at 12 months follow-up</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>4.2 (3.8)</td>
<td>4.7 (4.5)</td>
<td>0.42*</td>
<td>Intervention = Control</td>
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<tr>
<td>Depression</td>
<td>3.6 (3.1)</td>
<td>3.9 (3.4)</td>
<td>0.54*</td>
<td>Intervention = Control</td>
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<tr>
<td><strong>Horlick 1984:</strong></td>
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<tr>
<td><strong>Minnesota Multiphasic Personality Inventory (MMPI) at 3 months follow-up</strong></td>
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</tr>
<tr>
<td>Depression</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>MMPI at 6 months follow-up</strong></td>
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<tr>
<td>Depression</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Spielberger’s State and Trait Anxiety Scale at 3 months follow-up</strong></td>
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<td></td>
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<tr>
<td>Anxiety</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Spielberger’s State and Trait Anxiety Scale at 6 months follow-up</strong></td>
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</tr>
<tr>
<td>Anxiety</td>
<td>NR</td>
<td>NR</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Lang 2019:</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>HADS at 4 months follow-up</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Anxiety</td>
<td>5.7 (4.8)</td>
<td>6.4 (5.4)</td>
<td>0.65*</td>
<td>Intervention = Control</td>
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<tr>
<td>Depression</td>
<td>5.6 (4.4)</td>
<td>6.6 (4.5)</td>
<td>0.46*</td>
<td>Intervention = Control</td>
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<tr>
<td><strong>HADS at 6 months follow-up</strong></td>
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<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>5.5 (5.1)</td>
<td>6.0 (5.1)</td>
<td>0.75*</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Depression</td>
<td>5.4 (4.3)</td>
<td>6.9 (5.2)</td>
<td>0.31*</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>
### Table 2. Summary of psychological well-being data (Continued)

**Lenz 2000:**

| CES-D at 12 weeks follow-up (P value is over time repeated measures ANOVA) |
|---------------------------------|-----------------|-----------------|-----------------|
| Depressive symptoms             | 4.61 (NR)       | 2.72 (NR)       | < 0.91**        |

**Liljeroos 2012:**

| BDI-II at 3 months follow-up (data are Δ (SD)) |
|-----------------------------------------------|-----------------|-----------------|
| Depressive symptoms                          | 4.1 (9.3)       | 0.6 (10.8)      | 0.17            |

| BDI-II at 12 months follow-up (data are Δ (SD)) |
|-----------------------------------------------|-----------------|-----------------|
| Depressive symptoms                          | 0.7 (6.1)       | -0.4 (6.8)      | 0.47            |

<table>
<thead>
<tr>
<th>BDI-II at 24 months follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive symptoms</td>
</tr>
</tbody>
</table>

**Macken 2014:**

| PHQ-9 post intervention (6-12 weeks) (data are median (range)) |
|---------------------------------------------------------------|-----------------|-----------------|
| Depression                                                   | 2 (0 to 3)      | 1 (0 to 19)     | NR              |

| PHQ-9 at 3 months follow-up (data are median (range)) |
|------------------------------------------------------|-----------------|-----------------|
| Depression                                           | 1 (0 to 4)      | 2 (0 to 10)     | NR              |

**Mohammadpourhodki 2019:**

| Spielberg state anxiety questionnaire at 30 days follow-up: |
|-------------------------------------------------------------|-----------------|-----------------|
| Anxiety                                                     | 44.36 (3.89)    | 45.93 (8.02)    | 0.34*           |

**Nahlen-Bose 2016:**

<table>
<thead>
<tr>
<th>HADS at post-intervention follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
</tr>
</tbody>
</table>

| Depression                          | 4.51 (3.66)     | 5.00 (3.69)     | 0.56*           |

<table>
<thead>
<tr>
<th>HADS at 6 weeks follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
</tr>
</tbody>
</table>

| Depression                  | 4.26 (3.02)     | 5.33 (4.41)     | 0.22*           |

<table>
<thead>
<tr>
<th>HADS at 6 months follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
</tr>
</tbody>
</table>

| Depression                  | 4.60 (3.64)     | 5.13 (3.92)     | 0.54*           |
Table 2. Summary of psychological well-being data (Continued)

<table>
<thead>
<tr>
<th>HADS at 12 months follow-up</th>
<th>Anxiety</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.17 (3.72)</td>
<td>4.77 (4.23)</td>
</tr>
<tr>
<td></td>
<td>4.29 (2.96)</td>
<td>5.15 (4.00)</td>
</tr>
</tbody>
</table>

Parent 2000:

State-Trait Anxiety Inventory at 4 weeks follow-up

| State anxiety | 25.3 (5.4) | 31.4 (8.6) | < 0.5 | Intervention > Control |

Pischke 2008:

Goldberg’s General Health Questionnaire at 1 year follow-up

| Depression and anxiety | 3.5 (3.9) | 4.5 (4.6) | NS | Intervention = Control |

Goldberg’s General Health Questionnaire at 5 years follow-up

| Depression and anxiety | 5.9 (5.6) | 3.8 (4.1) | NS | Intervention = Control |

Pozehl 2014:

Patient-Reported Outcomes Measurement Information System (PROMIS-29) at 6 months follow-up

| Anxiety | 49.8 (10) | 51.9 (10.1) | 0.15* | Intervention = Control |
| Depression | 47.2 (8.7) | 50.2 (9.7) | 0.03* | Intervention > Control |

PROMIS-29 at 12 months follow-up

| Anxiety | 48.7 (9.3) | 51.3 (9.4) | 0.07* | Intervention = Control |
| Depression | 48.5 (8.2) | 50.6 (9.3) | 0.11* | Intervention = Control |

PROMIS-29 at 18 months follow-up

| Anxiety | 47.5 (8.5) | 52.8 (10.2) | 0.0006* | Intervention > Control |
| Depression | 45.6 (7.4) | 50 (9.7) | 0.0019* | Intervention > Control |

Smeulders 2017:

HADS at post-intervention follow-up

| Anxiety | 5.6 (4.6) | 5.5 (4.3) | 0.472** | Intervention = Control |
| Depression | 5.6 (4.3) | 5.3 (4.3) | 0.406** | Intervention = Control |

HADS at 6 months follow-up

| Anxiety | 6.0 (4.8) | 5.6 (4.5) | 0.745** | Intervention = Control |
### Table 2. Summary of psychological well-being data (Continued)

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td><strong>HADS at 12 months follow-up</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>5.9 (4.5)</td>
<td>5.2 (4.2)</td>
<td>0.207**</td>
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</tr>
<tr>
<td>Depression</td>
<td>5.9 (4.6)</td>
<td>4.8 (4.5)</td>
<td>0.403**</td>
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</tr>
</tbody>
</table>

**Vahedian-Azimi 2016:**

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td><strong>State and trait anxiety at 10 days follow-up</strong></td>
<td></td>
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</tr>
<tr>
<td>State anxiety</td>
<td>53.23 (7.98)</td>
<td>73.14 (6.05)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>52.23 (4.17)</td>
<td>43.40 (4.56)</td>
<td>0.921</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 3 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>54.3 (4.32)</td>
<td>76.09 (4.54)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>51.23 (4.8)</td>
<td>53.29 (5.54)</td>
<td>0.729</td>
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</table>

<table>
<thead>
<tr>
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<th>Intervention = Control</th>
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<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 6 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>55.83 (6.69)</td>
<td>71.34 (5.4)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>53.86 (3.87)</td>
<td>52.20 (4.63)</td>
<td>0.109</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 9 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>55.11 (6.16)</td>
<td>74.34 (3.51)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>53.43 (3.85)</td>
<td>52.20 (4.63)</td>
<td>0.406</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 12 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>54.69 (6.43)</td>
<td>72.31 (5.1)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>52.2 (4.63)</td>
<td>53.86 (3.87)</td>
<td>0.801</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 15 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>55.29 (5.56)</td>
<td>71.97 (4.94)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>54.06 (3.69)</td>
<td>54.14 (4.39)</td>
<td>0.930</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 18 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>55 (6.34)</td>
<td>71.71 (4.1)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>52.2 (4.63)</td>
<td>53.43 (3.85)</td>
<td>0.231</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Intervention = Control</th>
<th>Control</th>
<th></th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State and trait anxiety at 21 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>53.09 (4.97)</td>
<td>72 (5.04)</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>52.2 (4.63)</td>
<td>53.43 (3.85)</td>
<td>0.231</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. Summary of psychological well-being data (Continued)

<table>
<thead>
<tr>
<th>Trait anxiety</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State and trait anxiety at 24 months follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>51.94 (3.12)</td>
<td>71.94 (4.43)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>53.2 (4.63)</td>
<td>52.2 (4.63)</td>
<td>0.942</td>
</tr>
<tr>
<td>State and trait anxiety at 27 months follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State anxiety</td>
<td>54.23 (5.3)</td>
<td>72.26 (4.24)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Trait anxiety</td>
<td>55.06 (3.69)</td>
<td>54.06 (3.70)</td>
<td>0.843</td>
</tr>
</tbody>
</table>

**Yeh 2016:**

| POMS at 12 weeks follow-up (data are median (Q1, Q3)) | | | |
|------------------------------------------------------|--------------|---------|
| Depression |
| 0 (0, 2) | 4 (1, 6) | 0.004** |

*P value calculated by authors.

**Adjusted for baseline score.

a 6 months follow-up data only; at 12 months wait-list control patients received the intervention.

Abbreviations:

- BDI: Beck Depression Inventory
- CES-D: Center for Epidemiologic Studies - Depression
- HADS: Hospital Depression and Anxiety
- HAQ: Health Anxiety Questionnaire
- HRSD: Hamilton Rating Scale for Depression
- IQR: interquartile range
- NR: not reported
- NS: trialists report results ‘not-significant’ but P value not provided
- PHQ-9: Patient Health Questionnaire
- POMS: Profile of Mood States
- SD: standard deviation

### Table 3. Summary of smoking data

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Berkman 2003c:**

<table>
<thead>
<tr>
<th>Odds of post-MI smoking up to 54 months follow-up (data are OR (95% CI))</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.82 (0.65 to 1.02)</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

**Horlick 1984:**

<table>
<thead>
<tr>
<th>Smoking relapse at 6 months follow-up (data are %)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recidivism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45.2</td>
<td>21.1</td>
<td>0.20</td>
</tr>
<tr>
<td>Intervention = Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lindsay 2009:**
### Table 3. Summary of smoking data (Continued)

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarettes smoked per day at 6 months follow-up (data are Δ (SD))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cigarettes smoked per day</td>
<td>9 (8.2)</td>
<td>8.15 (7.2)</td>
<td>NS</td>
</tr>
<tr>
<td>Cigarettes smoked per day at 9 months follow-up (data are Δ (SD))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cigarettes smoked per day</td>
<td>11.45 (NR)</td>
<td>7.76 (NR)</td>
<td>NS</td>
</tr>
</tbody>
</table>

**Powell 2008:**

Participants who continued smoking at 12 months follow-up (data are N (%))

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continued smoking</td>
<td>16 (88.9)</td>
<td>27 (87.1)</td>
<td>0.85</td>
</tr>
</tbody>
</table>

**Shahriari 2013:**

Self-care behaviour at 1 month follow-up (data are mean score)

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>I smoke cigarettes</td>
<td>3.91</td>
<td>3.59</td>
<td>NR</td>
</tr>
</tbody>
</table>

**Toobert 2000:**

Stopped smoking at 24 months follow-up (data are n stopped smoking (n smokers))

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopped smoking</td>
<td>1 (1)</td>
<td>0 (1)</td>
<td>NR</td>
</tr>
</tbody>
</table>

**Vahedian-Azimi 2016:**

Smoking cessation at 24 months follow-up

<table>
<thead>
<tr>
<th>Measure of smoking</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cessation</td>
<td>NR</td>
<td>NR</td>
<td>NS (r = 0.9)</td>
</tr>
</tbody>
</table>

aData from subgroup of patients enrolled in the ENRICH-D trial.
C: confidence interval
MI: myocardial infarction
NR: not reported
NS: trialists report no significant differences between groups, but P value not reported
OR: odds ratio

### Table 4. Summary of physical activity data

<table>
<thead>
<tr>
<th>Measure of physical activity</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure of physical activity</td>
<td>Mean (SD) outcome at follow-up</td>
<td>P value</td>
<td>Difference between groups</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>---------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Aliabad 2014:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Godin-Leisure-Time Exercise Questionnaire at 4 months follow-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical activity (MET minutes)</td>
<td>182.86 (110.21)</td>
<td>147.39 (59.41)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Antypas 2014:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPAQ at 1 month follow-up (data are median (IQR))</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 4. Summary of physical activity data (Continued)

<table>
<thead>
<tr>
<th>Activity (MET minutes/week)</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total activity</td>
<td>2737.5 (4200.2)</td>
<td>1650 (2443.5)</td>
</tr>
</tbody>
</table>

**IPAQ at 3 months follow-up (data are median (IQR))**

<table>
<thead>
<tr>
<th>Activity (MET minutes/week)</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total activity</td>
<td>5613 (2828)</td>
<td>1356 (2937)</td>
</tr>
</tbody>
</table>

**Carroll 2006:**

**DASI at 12 weeks follow-up**

<table>
<thead>
<tr>
<th>Recovery behaviours</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18.8 (6.6)</td>
<td>19.5 (8.1)</td>
</tr>
</tbody>
</table>

**Dalal 2019:**

**Accelerometry at 4 months follow-up**

<table>
<thead>
<tr>
<th>Number of days/week with at least 10 min/day activity &gt; 100 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6 (2.6)</td>
<td>5.5 (2.6)</td>
<td>0.80*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) ≤ 20 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1107 (110)</td>
<td>1092 (116)</td>
<td>0.37*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 21 to 40 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>140 (35)</td>
<td>138 (30)</td>
<td>0.68*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 41 to 60 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 (27)</td>
<td>82 (26)</td>
<td>0.61*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 61 to 80 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 (21)</td>
<td>48 (22)</td>
<td>0.36*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) &gt; 100 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>43 (37)</td>
<td>51 (46)</td>
<td>0.20*</td>
</tr>
</tbody>
</table>

**Accelerometry at 12 months follow-up**

<table>
<thead>
<tr>
<th>Number of days/week with at least 10 min/day activity &gt; 100 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6 (2.4)</td>
<td>5.5 (2.6)</td>
<td>0.80*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) ≤ 20 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1092 (124)</td>
<td>1103 (118)</td>
<td>0.56*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 21 to 40 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>142 (39)</td>
<td>138 (34)</td>
<td>0.49*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 41 to 60 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>81 (30)</td>
<td>81 (28)</td>
<td>1.00*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average time/day (min) 61 to 80 milli-g</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 (23)</td>
<td>46 (22)</td>
<td>0.57*</td>
</tr>
</tbody>
</table>

**Dunn 2019:**

**Accelerometry at 6 weeks follow-up (data are Δ (SD))**

<table>
<thead>
<tr>
<th>Moderate to vigorous physical activity (MVPA) (min/day)</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.11 (6.38)</td>
<td>-1.05 (6.47)</td>
<td>0.29*</td>
</tr>
</tbody>
</table>

**Lang 2018:**

**Accelerometry at 4 months follow-up**
### Table 4. Summary of physical activity data (Continued)

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Number of days/week</th>
<th>Mean (SD)</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 10 min/day</td>
<td>5.6 (2.4)</td>
<td>5.7 (1.9)</td>
<td>0.85*</td>
<td>Control</td>
</tr>
<tr>
<td>≤ 20 min/day</td>
<td>1115 (110)</td>
<td>1103 (124)</td>
<td>0.74*</td>
<td>Control</td>
</tr>
<tr>
<td>21 to 40 min/day</td>
<td>140 (38)</td>
<td>143 (36)</td>
<td>0.79*</td>
<td>Control</td>
</tr>
<tr>
<td>41 to 60 min/day</td>
<td>79 (29)</td>
<td>84 (33)</td>
<td>0.60*</td>
<td>Control</td>
</tr>
<tr>
<td>61 to 80 min/day</td>
<td>45 (23)</td>
<td>45 (21)</td>
<td>1.00*</td>
<td>Control</td>
</tr>
<tr>
<td>81 to 100 min/day</td>
<td>25 (15)</td>
<td>25 (17)</td>
<td>1.00*</td>
<td>Control</td>
</tr>
<tr>
<td>&gt; 100 min/day</td>
<td>36 (31)</td>
<td>39 (52)</td>
<td>0.82*</td>
<td>Control</td>
</tr>
</tbody>
</table>

#### Accelerometry at 6 months follow-up

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Number of days/week</th>
<th>Mean (SD)</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 10 min/day</td>
<td>4.9 (2.7)</td>
<td>6.0 (2.1)</td>
<td>0.11*</td>
<td>Control</td>
</tr>
<tr>
<td>≤ 20 min/day</td>
<td>1136 (101)</td>
<td>1098 (114)</td>
<td>0.28*</td>
<td>Control</td>
</tr>
<tr>
<td>21 to 40 min/day</td>
<td>134 (37)</td>
<td>148 (41)</td>
<td>0.27*</td>
<td>Control</td>
</tr>
<tr>
<td>41 to 60 min/day</td>
<td>75 (25)</td>
<td>85 (27)</td>
<td>0.24*</td>
<td>Control</td>
</tr>
<tr>
<td>61 to 80 min/day</td>
<td>40 (20)</td>
<td>45 (19)</td>
<td>0.43*</td>
<td>Control</td>
</tr>
<tr>
<td>81 to 100 min/day</td>
<td>22 (15)</td>
<td>25 (15)</td>
<td>0.54*</td>
<td>Control</td>
</tr>
<tr>
<td>&gt; 100 min/day</td>
<td>32 (30)</td>
<td>39 (48)</td>
<td>0.59*</td>
<td>Control</td>
</tr>
</tbody>
</table>

#### Lindsay 2009:

### Days per week moderate exercise at 6 months follow-up

<table>
<thead>
<tr>
<th>Level</th>
<th>Mean (SD)</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate (days/week)</td>
<td>2.63 (1.78)</td>
<td>2.31 (1.59)</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Days per week moderate exercise at 9 months follow-up

<table>
<thead>
<tr>
<th>Level</th>
<th>Mean (SD)</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate (days/week)</td>
<td>1.71 (NR)</td>
<td>1.86 (NR)</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Macken 2014:

#### PA behaviour at 3 months follow-up (data are median change from baseline (min, max))

<table>
<thead>
<tr>
<th>Level</th>
<th>Min/week ≥ 3 METs</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.8 (-31.5, 201.3)</td>
<td>105 (-280, 1044.8)</td>
<td>0.42</td>
<td>Control</td>
</tr>
</tbody>
</table>

#### PA behaviour at 6 month follow-up (data are median change from 3 month follow-up (min, max))

<table>
<thead>
<tr>
<th>Level</th>
<th>Min/week ≥ 3 METs</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>-24.5 (-218.8, 855.8)</td>
<td>-11.4 (-770, 504)</td>
<td>0.79</td>
<td>Control</td>
</tr>
</tbody>
</table>

### Parent 2000:

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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### Jenkins Self-Efficacy Scale at 4 weeks follow-up

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>General activities</td>
<td>9.6 (0.7)</td>
<td>9.1 (1.1)</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Walking</td>
<td>9.7 (0.8)</td>
<td>9.5 (0.8)</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Climbing stairs</td>
<td>9.4 (1.0)</td>
<td>9.1 (1.1)</td>
<td>NS</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

### Pischke 2008: Adherence to exercise at 1 year follow-up (data are mean (SE))

<table>
<thead>
<tr>
<th>Exercise (times/week)</th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.97 (0.35)</td>
<td></td>
<td>2.87 (0.70)</td>
<td>0.01*</td>
</tr>
</tbody>
</table>

### Adherence to exercise at 5 years follow-up (data are mean (SE))

<table>
<thead>
<tr>
<th>Exercise (times/week)</th>
<th>Intervention</th>
<th>Control</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.34 (0.49)</td>
<td></td>
<td>3.57 (0.56)</td>
<td>0.31*</td>
</tr>
</tbody>
</table>

### Sher 2014: YPAS at 6 months follow-up

<table>
<thead>
<tr>
<th>YPAS</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>5365.4 (4141.8)</td>
<td></td>
</tr>
</tbody>
</table>

### YPAS at 12 months follow-up

<table>
<thead>
<tr>
<th>YPAS</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>6287.8 (6504.4)</td>
<td></td>
</tr>
</tbody>
</table>

### YPAS at 18 months follow-up

<table>
<thead>
<tr>
<th>YPAS</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>5403.3 (3867.1)</td>
<td></td>
</tr>
</tbody>
</table>

### Shoejaefar (pre-print): Walker’s lifestyle questionnaire at 3 months follow-up

<table>
<thead>
<tr>
<th>Physical activity</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.61 (3.11)</td>
<td></td>
</tr>
</tbody>
</table>

### Toobert 2000: Summary of self-care questionnaire at 4 months follow-up

<table>
<thead>
<tr>
<th># days exercise/last 7 days</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.8 (1.0)</td>
<td></td>
</tr>
</tbody>
</table>

### Summary of self-care questionnaire at 12 month follow-up

<table>
<thead>
<tr>
<th># days exercise/last 7 days</th>
<th>Intervention &gt; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 (1.6)</td>
<td></td>
</tr>
</tbody>
</table>

### Stanford 7-day recall at 4 months follow-up

<table>
<thead>
<tr>
<th>Average kilocalories expended per day</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>164 (101)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 4. Summary of physical activity data (Continued)

**Stanford 7-day recall at 12 months follow-up**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average kilocalories expended per day</td>
<td>198 (99)</td>
<td>138 (76)</td>
<td>0.307</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

**Turner 2014:**

**8-item Active Australia Survey at 4 months follow-up**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total activity time</td>
<td>570.67 (342.52)</td>
<td>317.81 (400.11)</td>
<td>0.07*</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

**8-item Active Australia Survey at 12 months follow-up**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total activity time</td>
<td>428.57 (397.16)</td>
<td>334.33 (426.60)</td>
<td>0.54*</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

*a*Arm 1 (peer advice) only.

*b*milli-g: 1000 milli-g = 1 g = 9.81 m/s²; < 40 milli-g is approximately equivalent to sedentary activities such as sitting or lying and ≥ 100 milli-g is approximately equivalent to activities undertaken at a moderate-to-vigorous intensity.

*c*Arm 2 (motivational social support from nurse and significant other) only.

*Calculated by authors.

**Adjusted for baseline value.

**Abbreviations:**

DASI: Duke Activity Status Index

IPAQ: International Physical Activity Questionnaire

IQR: interquartile range

METs: metabolic equivalents

mg: milli-g (units of acceleration)

NR: not reported

NS: trialists report results ‘not-significant’ but P value not provided

SD: standard deviation

SE: standard error

YPAS: Yale Physical Activity Survey

### Table 5. Summary of social isolation and connectedness data

<table>
<thead>
<tr>
<th>Measure of social isolation or connectedness</th>
<th>Mean (SD) outcome at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td><strong>Control</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Aliabad 2014:**

**Family support (same techniques as Schwarzer, Lippke, and Luszczynska, 2011) at 4 months follow-up (not validated)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>16.23 (2.73)</td>
<td>13.17 (2.39)</td>
<td>&lt; 0.001</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

**Antypas 2014:**

**Social support (adaptation of scale from Barrera et al) at 1 month follow-up (data are median (IQR)) (not validated)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>4.2 (1.8)</td>
<td>4.2 (2.7)</td>
<td>0.88</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>

**Social support (adaptation of scale from Barrera et al) at 3 months follow-up (data are median (IQR)) (not validated)**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social support</td>
<td>4.8 (2.3)</td>
<td>3.9 (1.8)</td>
<td>0.46</td>
<td>Intervention = Control</td>
</tr>
</tbody>
</table>
### Table 5. Summary of social isolation and connectedness data (Continued)

**Asbury 2014:**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Intervention</th>
<th>Control</th>
<th>p</th>
<th>Intervention = Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ESSI at 12 months follow-up</strong></td>
<td>Total</td>
<td>18.2 (4.6)</td>
<td>17.37 (5.33)</td>
<td>0.56</td>
</tr>
<tr>
<td><strong>Bakan 2008:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal Support Evaluation List (ISEL) - short form at 3 months follow-up</strong></td>
<td>Social support</td>
<td>47.38 (3.8)</td>
<td>40.63 (5.03)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td><strong>Berkman 2003:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ESSI at 6 months follow-up</strong></td>
<td>ESSI</td>
<td>26.3 (6.2)</td>
<td>25 (6.7)</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td><strong>PSSS at 6 months follow-up</strong></td>
<td>PSST</td>
<td>66.4 (14.3)</td>
<td>62.8 (15.2)</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td><strong>Blom 2009:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ISSI at 2 years follow-up</strong></td>
<td>Availability of social integration</td>
<td>NR</td>
<td>NR</td>
<td>0.38**</td>
</tr>
<tr>
<td></td>
<td>Availability of attachment</td>
<td>NR</td>
<td>NR</td>
<td>0.90**</td>
</tr>
<tr>
<td><strong>Boese 2013:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Brief form of the perceived social support questionnaire (FSozU) at 6 months follow-up</strong></td>
<td>Social support</td>
<td>3.25 (0.88)</td>
<td>3.38 (0.95)</td>
<td>0.49*</td>
</tr>
<tr>
<td><strong>FSozU at 12 months follow-up</strong></td>
<td>Social support</td>
<td>3.41 (0.91)</td>
<td>3.41 (0.97)</td>
<td>1.00*</td>
</tr>
<tr>
<td><strong>Clark 2000:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MOS Social Support at 4 months follow-up (data are Δ)</strong></td>
<td>MOS Social support score</td>
<td>-0.31 (NR)</td>
<td>-1.78 (NR)</td>
<td>0.23</td>
</tr>
<tr>
<td><strong>MOS Social Support at 12 months follow-up (data are Δ)</strong></td>
<td>MOS Social support score</td>
<td>-1.3 (NR)</td>
<td>-0.92 (NR)</td>
<td>0.49</td>
</tr>
<tr>
<td><strong>Colella 2018:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SSSS at 6 weeks follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5. Summary of social isolation and connectedness data (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Social support measure</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SSSS at 12 weeks follow-up</strong></td>
<td>Perceived contribution of social support</td>
<td>2.64 (1.05)</td>
<td>2.56 (0.94)</td>
</tr>
<tr>
<td><strong>Cossette 2016:</strong></td>
<td>Perceived level of support</td>
<td>61.86 (6.63)</td>
<td>62.46 (6.57)</td>
</tr>
<tr>
<td><strong>Dunbar 2013 (Family partnership intervention vs usual care arm):</strong></td>
<td>Autonomy support</td>
<td>6.0 (1.3)</td>
<td>5.8 (1.0)</td>
</tr>
<tr>
<td><strong>Dunbar 2013 (Patient family education vs usual care arm):</strong></td>
<td>Autonomy support</td>
<td>6.2 (0.7)</td>
<td>5.8 (0.8)</td>
</tr>
<tr>
<td><strong>Gortner 1988:</strong></td>
<td>FIRM at 3 months follow-up (data are between-group difference (95% CI))</td>
<td>-0.21 (-6.03 to 5.62)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Gortner 1988:</strong></td>
<td>FIRM at 6 months follow-up (data are between-group difference (95% CI))</td>
<td>-2.44 (-8.90 to 4.02)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Heisler 2013:</strong></td>
<td>Diabetes Social Support Scale adapted to reference HF at 6 months follow-up (validated?)</td>
<td>27.2 (NR)</td>
<td>25.9 (NR)</td>
</tr>
<tr>
<td><strong>Lindsay 2009:</strong></td>
<td>Social support at 6 months follow-up (no information on validation)</td>
<td>17.59 (4.3)</td>
<td>16.16 (4.14)</td>
</tr>
</tbody>
</table>

Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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Table 5. Summary of social isolation and connectedness data (Continued)

Social support at 9 months follow-up (no information on validation)

<table>
<thead>
<tr>
<th></th>
<th>Social support score</th>
<th>Instrumental support</th>
<th>Adequacy of social support</th>
<th>p-value</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social support score</strong></td>
<td>17.4 (NR)</td>
<td>17.21 (NR)</td>
<td>NS</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Pischke 2008:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>21.5 (5.2)</td>
<td>19.8 (3.7)</td>
<td>0.22*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>5.4 (3.4)</td>
<td>4.1 (2.2)</td>
<td>0.14*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Adequacy of social support</td>
<td>16.1 (2.8)</td>
<td>15.6 (2.7)</td>
<td>0.54*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><em><em>Social support</em> (adapted version of the Social Support Questionnaire (Berkman &amp; Syme, 1979; Seeman &amp; Syme, 1987)) at 1 year follow-up</em>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>20.4 (4.3)</td>
<td>20.5 (6.3)</td>
<td>0.95*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Instrumental support</td>
<td>5.0 (2.8)</td>
<td>4.7 (3.7)</td>
<td>0.75*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Adequacy of social support</td>
<td>15.4 (2.2)</td>
<td>15.8 (3.7)</td>
<td>0.64*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Powell 2008:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support - emotional</td>
<td>0.7 (18.6)</td>
<td>1.4 (17.9)</td>
<td>0.66</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Riegel 2004:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UCLA-SSI at 90 day follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support desired</td>
<td>3.04 (0.70)</td>
<td>3.01 (0.80)</td>
<td>NS</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Support sought</td>
<td>3.79 (1.55)</td>
<td>4.23 (1.47)</td>
<td>NS</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Satisfaction with support received</td>
<td>5.15 (1.67)</td>
<td>5.14 (1.35)</td>
<td>NS</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Support reciprocity</td>
<td>2.78 (0.86)</td>
<td>3.52 (0.73)</td>
<td>&lt; 0.05</td>
<td></td>
<td>Intervention &lt; Control</td>
</tr>
<tr>
<td><strong>Toobert 2000:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friend and family support (Sallis 1987) at 4 months follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total positive score</td>
<td>15.2 (4.1)</td>
<td>12.1 (3.2)</td>
<td>0.04*</td>
<td></td>
<td>Intervention &gt; Control</td>
</tr>
<tr>
<td>Total negative score</td>
<td>12.6 (5.7)</td>
<td>12.6 (3.9)</td>
<td>1.00*</td>
<td></td>
<td>Intervention = Control</td>
</tr>
<tr>
<td><strong>Friend and family support (Sallis 1987) at 12 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total positive score</td>
<td>15.6 (4.7)</td>
<td>11.8 (3.8)</td>
<td>0.042</td>
<td></td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

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### Table 5. Summary of social isolation and connectedness data (Continued)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean (SD) intervention at follow-up</th>
<th>Mean (SD) control at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total negative score</td>
<td>11.5 (3.6)</td>
<td>11.8 (4.2)</td>
<td>0.411</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Interpersonal support evaluation (Cohen 1985) at 4 months follow-up</td>
<td>62.8 (7.3)</td>
<td>63.3 (4.9)</td>
<td>0.84*</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Interpersonal support evaluation (Cohen 1985) at 12 months follow-up</td>
<td>86.0 (15.4)</td>
<td>86.8 (9.7)</td>
<td>0.097</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Turner 2014: ESSI at 4 months follow-up</td>
<td>27.18 (5.59)</td>
<td>24.38 (5.33)</td>
<td>0.18*</td>
<td>Intervention = Control</td>
</tr>
<tr>
<td>Turner 2014: ESSI at 12 months follow-up</td>
<td>28.79 (4.04)</td>
<td>24.60 (5.50)</td>
<td>0.03*</td>
<td>Intervention &gt; Control</td>
</tr>
</tbody>
</table>

*Calculated by authors.
**Adjusted for baseline values.

Abbreviations:
- ESSI: ENRICHED Social Support Instrument
- FCCQ-P: Family Care Climate Questionnaire - Patient version
- FIRM: Family Inventory of Resources for Management
- HF: heart failure
- IQR: interquartile range
- ISSI: Interview Schedule for Social Interaction
- MOS: Medical Outcomes Study
- NR: not reported
- NS: trialists report results 'not-significant' but P value not provided
- PSSS: Perceived Social Support Scale
- SSSS: Funch’s Shortened Social Support Scale
- UCLA-SSI: UCLA Social Support Inventory

### Table 6. Summary of patient satisfaction data

<table>
<thead>
<tr>
<th>Measure of patient satisfaction</th>
<th>Mean (SD) intervention at follow-up</th>
<th>Mean (SD) control at follow-up</th>
<th>P value</th>
<th>Difference between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antypas 2014: User evaluation at 1 month follow-up (data are n/N (%))</td>
<td>Whether they would recommend the site to a friend</td>
<td>6/9 (68%)</td>
<td>9/13 (69%)</td>
<td>0.99</td>
</tr>
<tr>
<td>Dunn 2019: Patient satisfaction with components of Heart Up! intervention at 2 months follow-up</td>
<td>Patient satisfaction</td>
<td>3.37 (0.43)</td>
<td>3.4 (0.43)</td>
<td>0.88*</td>
</tr>
</tbody>
</table>
### Table 6. Summary of patient satisfaction data (Continued)

**Lenz 2000:**

Patient satisfaction questionnaire (Jacox 1997) at 12 weeks follow-up (P value is repeated measures over time ANOVA)

<table>
<thead>
<tr>
<th>Satisfaction</th>
<th>103.63 (NR)</th>
<th>98.72 (NR)</th>
<th>&lt; 0.18</th>
<th>Intervention = Control</th>
</tr>
</thead>
</table>

*a*Arm 2 only (motivational interview from nurse and social support from significant other). SD: standard deviation

### Table 7. Meta regression for all-cause mortality at longest follow-up

<table>
<thead>
<tr>
<th>Explanatory variable (n trials)</th>
<th>Exp (slope)*</th>
<th>95% confidence interval, P value</th>
<th>Proportion of variance explained (adjusted $R^2$)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of intervention (social network only vs multi-component)</td>
<td>RR = 0.92</td>
<td>0.09 to 9.21, $P = 0.94$</td>
<td>-21.34%</td>
<td>No evidence that risk ratio is associated with type of intervention</td>
</tr>
<tr>
<td>(n = 23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of intervention (weeks)</td>
<td>RR = 1.00</td>
<td>0.99 to 1.01, $P = 0.46$</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with duration of intervention</td>
</tr>
<tr>
<td>(n = 20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of population (acute vs chronic condition)</td>
<td>RR = 0.90</td>
<td>0.67 to 1.21, $P = 0.46$</td>
<td>100%</td>
<td>No evidence that risk ratio is associated with type of population</td>
</tr>
<tr>
<td>(acute vs mixed population)</td>
<td>RR = 0.65</td>
<td>0.40 to 1.07, $P = 0.09$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting (home vs centre-based)</td>
<td>RR = 1.18</td>
<td>0.64 to 2.18, $P = 0.56$</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with setting</td>
</tr>
<tr>
<td>(home vs patient choice)</td>
<td>RR = 0.70</td>
<td>0.34 to 1.44, $P = 0.30$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery mode (remote vs face-to-face)</td>
<td>RR = 1.14</td>
<td>0.69 to 1.86, $P = 0.60$</td>
<td>-729.8%</td>
<td>No evidence that risk ratio is associated with delivery mode</td>
</tr>
<tr>
<td>(remote vs hybrid)</td>
<td>RR = 7.30</td>
<td>0.24 to 222.31, $P = 0.24$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery group (one-to-one vs group)</td>
<td>RR = 1.61</td>
<td>1.02 to 2.54, $P = 0.04$</td>
<td>100%</td>
<td>No evidence that risk ratio is associated with delivery group</td>
</tr>
<tr>
<td>(one-to-one vs hybrid)</td>
<td>RR = 1.39</td>
<td>0.87 to 2.22, $P = 0.16$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 7. Meta regression for all-cause mortality at longest follow-up (Continued)

<table>
<thead>
<tr>
<th>Explanatory variable (n trials)</th>
<th>Exp (slope)*</th>
<th>95% confidence interval, P value</th>
<th>Proportion of variance explained (adjusted R²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of intervention (social network only, or multicomponent) (n = 10)</td>
<td>RR = 1.08</td>
<td>0.09 to 12.43, P = 0.95</td>
<td>24.6%</td>
<td>No evidence that risk ratio is associated with type of intervention</td>
</tr>
<tr>
<td>Duration of intervention (weeks) (n = 8)</td>
<td>RR = 1.00</td>
<td>0.99 to 1.00, P = 0.33</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with duration of intervention</td>
</tr>
<tr>
<td>Type of population (acute vs chronic condition) (n = 10)</td>
<td>RR = 1.03</td>
<td>0.74 to 1.43, P = 0.86</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with type of population</td>
</tr>
<tr>
<td>Setting (home vs centre-based) (home vs patient choice) (n = 9)</td>
<td>RR = 0.92</td>
<td>0.46 to 1.82, P = 0.77</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with setting</td>
</tr>
<tr>
<td>Delivery mode (remote vs face-to-face) (remote vs hybrid) (n = 10)</td>
<td>RR = 1.17</td>
<td>0.70 to 1.97, P = 0.50</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with delivery mode</td>
</tr>
<tr>
<td>Delivery group (One-to-one vs group)</td>
<td>RR = 1.00</td>
<td>0.64 to 1.56, P = 0.99</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with delivery group</td>
</tr>
</tbody>
</table>

HIC: high-income country
LMIC: low- and middle-income country
RR: risk ratio

Table 8. Meta regression for all-cause hospitalisation at longest follow-up

<table>
<thead>
<tr>
<th>Explanatory variable (n trials)</th>
<th>Exp (slope)*</th>
<th>95% confidence interval, P value</th>
<th>Proportion of variance explained (adjusted R²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of intervention (social network only, or multicomponent) (n = 10)</td>
<td>RR = 1.17</td>
<td>0.55 to 1.83, P = 0.99</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with type of intervention</td>
</tr>
<tr>
<td>Setting (home vs centre-based) (home vs patient choice) (n = 9)</td>
<td>RR = 1.00</td>
<td>0.58 to 1.85, P = 0.88</td>
<td>0%</td>
<td>No evidence that risk ratio is associated with delivery group</td>
</tr>
</tbody>
</table>
Table 8. Meta regression for all-cause hospitalisation at longest follow-up (Continued)
(One-to-one vs hybrid)

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>95% CI</th>
<th>P</th>
<th>Evidence of association</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMIC vs HIC</td>
<td>0.47</td>
<td>0.20 to 1.10</td>
<td>0.08</td>
<td>No evidence that risk ratio is associated with LMIC</td>
</tr>
<tr>
<td>Mean age</td>
<td>1.01</td>
<td>0.98 to 1.04</td>
<td>0.51</td>
<td>No evidence that risk ratio is associated with mean age</td>
</tr>
<tr>
<td>% male participants</td>
<td>1.00</td>
<td>0.99 to 1.02</td>
<td>0.64</td>
<td>No evidence that risk ratio is associated with % male participants</td>
</tr>
</tbody>
</table>

HIC: high-income country
LMIC: low- and middle-income country
ROB: risk of bias
RR: risk ratio

APPENDICES

Appendix 1. Search strategies
CENTRAL
#1 MeSH descriptor: [Coronary Disease] explode all trees
#2 ((coronary or heart) NEAR/2 disease*):ti,ab
#3 CHD:ti,ab
#4 CAD:ti,ab
#5 MeSH descriptor: [Heart Failure] explode all trees
#6 "heart failure":ti,ab
#7 HF:ti,ab
#8 MeSH descriptor: [Myocardial Infarction] explode all trees
#9 "myocardial infarct*":ti,ab
#10 MI:ti,ab
#11 "heart attack*":ti,ab
#12 Revasculari?ation*:ti,ab
#13 MeSH descriptor: [Coronary Artery Bypass] explode all trees
#14 "coronary artery bypass":ti,ab
#15 CABG:ti,ab
#16 MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees
#17 "percutaneous coronary intervention":ti,ab
#18 PCI:ti,ab
#19 MeSH descriptor: [Angioplasty] explode all trees

#20 angioplast*:ti,ab

#21 MeSH descriptor: [Angina, Stable] this term only

#22 "Stable angina":ti,ab

#23 MeSH descriptor: [Atrial Fibrillation] this term only

#24 "atrial fibrillation*":ti,ab

#25 AF:ti,ab

#26 (valve NEAR/2 (replace* or repair*)):ti,ab

#27 [OR #1-#26]

#28 MeSH descriptor: [Social Networking] this term only

#29 "social network*":ti,ab

#30 MeSH descriptor: [Social Support] explode all trees

#31 "social support":ti,ab

#32 Partner*:ti,ab

#33 MeSH descriptor: [Caregivers] this term only

#34 Caregiver*:ti,ab

#35 MeSH descriptor: [Friends] this term only

#36 Friend*:ti,ab

#37 MeSH descriptor: [Family] this term only

#38 (family or families):ti,ab

#39 Relatives:ti,ab

#40 (spouse* or wife or wives or husband or husbands or partner*):ti,ab

#41 supporter*:ti,ab

#42 MeSH descriptor: [Peer Group] this term only

#43 (peer or peers):ti,ab

#44 MeSH descriptor: [Social Media] this term only

#45 ("social media" or facebook or twitter):ti,ab

#46 MeSH descriptor: [Mobile Applications] this term only

#47 ((mobile or electronic) NEAR/2 (app or apps or application*)):ti,ab

#48 [OR #28-#47]

#49 #27 AND #48

MEDLINE Ovid

1 exp Coronary Disease/

2 ((coronary or heart) adj2 disease*).tw.
Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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38 (family or families).tw.
39 Relatives.tw.
40 (spouse* or wife or wives or husband or husbands or partner*).tw.
41 supporter*.tw.
42 peer group/
43 (peer or peers).tw.
44 Social Media/
45 (social media or facebook or twitter).tw.
46 Mobile Applications/
47 (mobile or electronic) adj2 (app or apps or application*).tw.
48 or/28-47
49 27 and 48
50 randomized controlled trial.pt.
51 controlled clinical trial.pt.
52 randomized.ab.
53 placebo.ab.
54 clinical trials as topic.sh.
55 randomly.ab.
56 trial.ti.
57 50 or 51 or 52 or 53 or 54 or 55 or 56
58 exp animals/ not humans.sh.
59 57 not 58
60 49 and 59

Embase Ovid
1 exp coronary artery disease/
2 ((coronary or heart) adj2 disease*).tw.
3 CHD.tw.
4 CAD.tw.
5 exp heart failure/
6 heart failure.tw.
7 HF.tw.
8 exp heart infarction/
9 myocardial infarct*.tw.
10 MI.tw.
Social network interventions to support cardiac rehabilitation and secondary prevention in the management of people with heart disease (Review)

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46 mobile application/
47 ((mobile or electronic) adj2 (app or apps or application*)).tw.
48 or/28-47
49 27 and 48
50 random$.tw.
51 factorial$.tw.
52 crossover$.tw.
53 cross over$.tw.
54 cross-over$.tw.
55 placebo$.tw.
56 (doub$ adj blind$).tw.
57 (sing$ adj blind$).tw.
58 assign$.tw.
59 allocate$.tw.
60 volunteer$.tw.
61 crossover procedure/
62 double blind procedure/
63 randomized controlled trial/
64 single blind procedure/
65 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
66 (animal/ or nonhuman/) not human/
67 65 not 66
68 49 and 67
69 limit 68 to embase

WOS Core Collection
# 19 #18 AND #17
# 18 TS=(random* or blind* or allocate* or assign* or trial* or placebo* or crossover* or cross-over*)
# 17 #16 AND #12
# 16 #15 OR #14 OR #13
# 15 TS=((mobile or electronic) NEAR/2 (app or apps or application*))
# 14 TS=("social media" or facebook or twitter)
# 13 TS=("social network" or "social support")
# 12 #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
# 11 TS=(valve NEAR/2 (replace* or repair*))
ClinicalTrials.gov

Condition or disease: Heart Diseases

Study type: Interventional Studies (Clinical Trials)

Intervention/treatment: (social network OR social support)

WHO ICTRP

Condition: "Heart Disease"

Intervention: "social network" OR "social support"

Recruitment status: All

HISTORY

Protocol first published: Issue 12, 2020

CONTRIBUTIONS OF AUTHORS

All authors approved the final version of this manuscript.

CP co-ordinated the overall study, contributed to the conceptual focus, independent title and abstract screening, full-text review, data extraction and risk of bias assessment, and led the drafting of the manuscript.

GD contributed to independent title and abstract screening, full-text review and data extraction, co-ordinated risk of bias assessment, led the statistical analysis, and contributed to the drafting of the manuscript.

MHB contributed to independent title and abstract screening, full text review, and risk of bias assessment.

LM contributed to the conceptual focus and independent full-text review.

VJP contributed to independent data extraction and risk of bias assessment.

SS contributed to the conceptual focus, and independent title and abstract screening.

MT contributed to data extraction.

SAS contributed to the conceptual focus, risk of bias assessment and drafting of the manuscript, arbitrated discrepancies, and provided specialist expertise on social support for health.
RST designed and supported the statistical analysis, contributed to risk of bias assessment and drafting of the manuscript, arbitrated discrepancies, and provided specialist expertise on cardiac rehabilitation and secondary prevention of heart disease.

**DECLARATIONS OF INTEREST**

SCP: none known.

GD: none known.

MHB: is a methods editor for Cochrane Public Health and was the principal investigator (September 2021 to April 2022) on a project funded by Cochrane relating to methods for reviews that include non-randomised studies. The methods developed and assessed within the project were not applied (or applicable) in this review.

LM: none known.

VJP: none known.

SS: none known.

MT: none known.

SAS: none known.

RST: none known.

**SOURCES OF SUPPORT**

**Internal sources**

- MRC/CSO Social and Public Health Sciences Unit, University of Glasgow, UK

  Dr Purcell was funded from February 2020 to July 2022 by Heart Research UK to undertake an implementation study of REACH-HF in Scotland. Due to project delays associated with COVID-19, it was agreed with HRUK that some of Dr Purcell’s time could be re-purposed to undertake this review. Dr Dibben, Dr Hilton Boon, Dr Matthews, Dr Palmer, Ms Thomson and the remainder of Dr Purcell’s time on the review was supported by the Medical Research Council (grant number MC_UU_00022/1) and Chief Scientist Office of the Scottish Government Health and Social Care Directorates (grant number SPHSU16). Profs Taylor and Simpson are funded for their time as University of Glasgow employees.

  For the purpose of open access, the authors have applied a Creative Commons Attribution (CC BY) licence to any Author Accepted Manuscript version arising.

**External sources**

- NIHR, UK

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**DIFFERENCES BETWEEN PROTOCOL AND REVIEW**

The World Health Organization International Clinical Trials Registry Platform (apps.who.int/trialsearch/) was not available at the time the searches were conducted and therefore was not searched. Due to the unanticipated volume of included studies and capacity constraints relating to the COVID-19 pandemic, searches were re-run after six months and any additional studies included at that stage.

We made slight amendments to the description of data extraction and management to reflect the finalised data extraction process, refined in the process of screening. Characteristics under Subgroup analysis and investigation of heterogeneity were also amended accordingly. The data screening, extraction, and RoB2 were conducted by different team members than originally stated, due to changes in availability/capacity (updates noted in relevant sections in Methods, and in Contributions of authors).

The diversity in interventions and variability in reporting meant that it was not possible to develop, as part of the current review, a logic model that would effectively theorise the relationship between social networks, social support, and heart disease outcomes. However, further work is being taken forward by the review team to explore how existing models of social support for health and established approaches to theorising and implementing behaviour change can support this theoretical development.
INDEX TERMS

Medical Subject Headings (MeSH)
*Cardiac Rehabilitation [methods]; *Myocardial Infarction [epidemiology]; Quality of Life; Secondary Prevention; Social Networking

MeSH check words
Aged; Female; Humans; Male; Middle Aged