A meta-analysis of randomized control trials of home-based secondary prevention programs for coronary artery disease


CRD summary
This review concluded that home-based interventions for secondary prevention of coronary heart disease were promising for individuals less likely to access hospital-based cardiac rehabilitation. The relative effectiveness of home-based over hospital-based interventions remained unclear and more research was needed. Data came mainly from smaller shorter term studies of generally poor quality, but the authors' conservative conclusions appear reasonable.

Authors' objectives
To compare the benefits and costs of home-based cardiac rehabilitation programmes to usual care and cardiac rehabilitation for the secondary prevention of coronary heart disease.

Searching
Nineteen databases, including MEDLINE and EMBASE, were searched. Search terms were not reported. Bibliographies of previous reviews were checked. Only full articles or theses published in English were eligible.

Study selection
Randomised controlled trials (RCTs) that assessed exclusively or predominantly home-based secondary prevention programmes as compared to usual care or cardiac rehabilitation provided in a hospital or other centre for coronary heart disease were eligible for inclusion. Studies that focused on a single risk factor other than exercise were excluded. Outcomes reported were all-cause mortality, cardiovascular events, quality of life, coronary heart disease risk factors and costs.

Most of the included studies were conducted in UK, USA and Canada. Mean age ranged from 52 to 73 years. The mean proportion of women was 24%. The interventions were generally complex and included paper-based, telephone-based, home visits and/or electronic methods. Duration of treatment was six minutes in one trial and ranged from one to 14 months in others (most were less than 12 months).

Two authors independently selected studies for inclusion.

Assessment of study quality
Trial quality was assessed using the Jadad scale of randomisation, allocation concealment and inclusion of an adequate description of the comparator group.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Data were extracted in order to calculate risk ratios (RR) with 95% confidence intervals (CI) for dichotomous data. For continuous data, changes from baseline were extracted where available, otherwise endpoint data were used to calculate mean difference (MD) and 95% CI.

Two authors extracted data independently and a third author checked data. Authors were contacted for additional data.

Methods of synthesis
DerSimonian and Laird random-effects models were used to calculate pooled risk ratios and 95% CI, and weighted mean difference (WMD) where scales were the same or standardised mean difference (SMD) where scales were different, and 95% CIs. Trials were grouped according to comparator treatments (usual care versus cardiac
rehabilitation). Statistical heterogeneity was assessed using $I^2$. Subgroup analyses were undertaken based on length of follow-up (<12 months versus ≥12 months).

**Results of the review**

Thirty-six RCTs (8,297 participants) were included. One trial had 1,376 participants and others ranged from 15 to 792 participants; 20 trials included fewer than 150 participants.

Methodological quality of trials was low to moderate, 10 scored 1, 14 scored 2 and 12 scored 3 on the Jadad scale (maximum available was 5). In 24 trials the method of randomisation was either unclear or not appropriate. Only nine trials described an adequate method of allocation concealment. Nine trials did not clearly describe the comparator group treatment.

Compared to usual care, home-based intervention had no statistically significant effect on mortality ($I^2=0\%$, four trials) and cardiovascular events ($I^2=0\%$, five trials). Five trials reported on quality of life, the summative mean difference indicated a benefit with home-based intervention (SMD 0.23, 95% CI 0.02 to 0.45). Significant improvements in quality of life were evident with shorter term trials and not with longer term trials.

Compared to cardiac rehabilitation, home-based intervention had no statistically significant effect on mortality ($I^2=0\%$, six trials) and cardiovascular events ($I^2=89.7\%$, three trials). For cardiovascular events, one trial reported a statistically significant benefit with home-based intervention and two did not. One trial showed a significant improvement in quality of life with home based intervention. Overall there was no statistically significant effect on quality of life (five trials).

Compared to usual care there were statistically significant benefits for risk factors (systolic blood pressure, cholesterol levels, smoking cessation and depression scores) with home-based intervention. There were no statistically significant differences when compared to cardiac rehabilitation (full results reported). There was evidence of statistical heterogeneity for some risk factor results.

**Cost information**

Eight trials reported on costs. Six reported a cost saving with home-based intervention, but only three trials presented data to support this. The cost of the intervention averaged US$300 (adjusted for inflation) per participant.

**Authors' conclusions**

Home-base interventions were promising for individuals less likely to access hospital-based cardiac rehabilitation, but until further high-quality evidence was undertaken, the relative effectiveness of home-based interventions over hospital-based interventions would remain unclear.

**CRD commentary**

The aims of the review were clearly stated in terms of study design, participants and intervention. A large number of databases was searched. The search was restricted to published English-language studies. It was possible that language and publication biases affected the review. Methods of study selection and data extraction aimed at reduced risks of reviewer error and bias; methods for quality assessment were unclear. Study quality was assessed using previously published criteria. The methods of synthesis appeared generally appropriate, although there was considerable heterogeneity between studies for some outcomes and it was unclear whether pooling of these data was appropriate. Data came from relatively short-term studies, many of which were small and of lower quality.

The authors' conservative conclusions appear reasonable.

**Implications of the review for practice and research**

**Practice:** The authors stated that home-based secondary prevention programmes for coronary heart disease should be considered for stable patients who were less likely to access or adhere to hospital-based programmes.

**Research:** The authors stated that further research using larger trials with longer follow up was needed to determine whether home-based secondary prevention programmes for coronary heart disease were as effective as traditional hospital-based programmes. Trials should be adequately described in order to investigate possible differences in
subgroups.

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