

The Cost-Effectiveness of Home-Based Cardiac Rehabilitation Interventions: A Systematic Review

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Background

- Cardiac rehabilitation (CR) is a supervised secondary prevention program, consisting of exercise, health education and psychological intervention¹
- CR is recognised as cost-effective in reducing morbidity and mortality following a cardiac event²
- Programs are traditionally centre-based (e.g., within a hospital setting)
- Home-based alternatives (delivered remotely) are increasingly used, particularly since the COVID-19 pandemic³

Research questions: Are home-based CR interventions cost-effective, compared to centre-based options? What is quality of the existing evidence?

Methods

- Electronic searches (October 2021) were conducted using MEDLINE, EMBASE and EconLit via Ovid

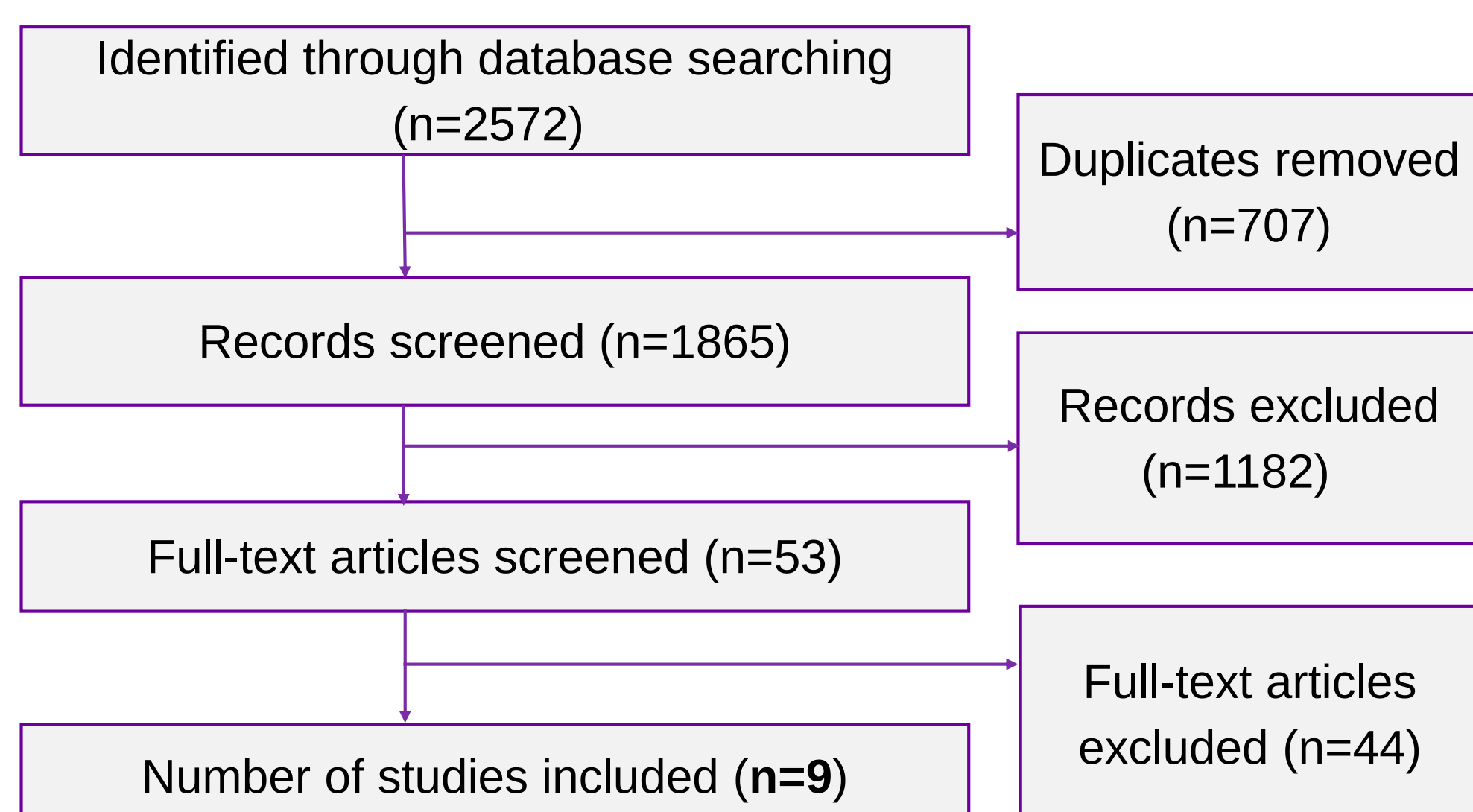
Table 1: Inclusion criteria

Population	The population offered CR in line with guidelines from the National Institute for Health and Care Excellence (NICE) ⁴⁻⁶
Intervention	Home-based interventions that were either participation in a CR programme or an intervention that maybe classed as an individual aspect of a comprehensive CR programme
Comparator	Relevant comparator delivered in usual care (i.e., centre-based CR)
Study design	Full economic evaluation (synthesising costs and benefits of two or more interventions)

- Pre-specified data extraction was based on the NHS Economic Evaluation Database (NHS EED) handbook
- Studies were critically appraised using the Drummond checklist and Consolidated Health Economic Evaluation Reporting Standards (CHEERS) checklists^{7,8}
- Results were summarised in a narrative synthesis
- The protocol was registered on the PROSPERO database (CRD42021286252)

Results

Figure 1: PRISMA diagram



Results Cont.

Interventions

- Heterogeneous intervention designs with a duration of 8 – 24 weeks
- Commonly including elements of exercise training assisted by technology (e.g., accelerometer or mobile phone), virtual discussions with healthcare providers and telephone communication
- Comparators were traditional centre-based CR (in inpatient, outpatient or community settings)

Population/sample

- Samples reflected the varied populations that can access CR services (most commonly coronary artery disease, heart disease or failure and myocardial infarction, amongst others)
- Sample sizes ranging 53-773, mean age 59-67 and samples were predominantly male (up to 91%)

Measure of benefit/analysis type

- All studies were cost-utility analyses using Quality-Adjusted Life-Years (QALYs), with the EQ-5D as the most common measure of health status (6/9)
- Within trial (8/9); model based using single trial (1/9)

Costs and perspective

- The majority of studies (7/9) used a healthcare system perspective, with a minority (2/9) taking a societal perspective
- A single study included productivity costs and informal care costs. Exclusion of productivity costs is often justified by the age of samples
- Two studies included intervention costs only
- Two studies included patient out-of-pocket expenses

- The quality of reporting differed across studies, with no publication reporting full details for all CHEERS items
- From the Drummond checklist, the overall methodological quality of the identified publications appears to be good, as most publications comply with most of the items from the checklist
- Key limitations which may contribute to uncertainty and limit the generalisability of findings include: heterogeneity in the intervention delivery, a lack of information to reproduce the comparator, a lack of long-term follow-up data and limited sample sizes

Compared to traditional, centre-based CR:

- Over half of studies (5/9) found home-based CR was cost-saving
- Two-thirds of studies (6/9) found home-based CR was health improving
- The majority of studies (7/9) found home-based CR was cost-effective

Conclusion

- Most studies concluded that home-based CR was cost-effective
- Decision makers wishing to use this evidence will need to consider whether the results can be generalised and applied to their local setting
- Future research is needed to investigate patient preferences for the different modes of CR delivery (home-based, hybrid or centre-based)

References

- Dalal HM, Doherty P, Taylor RS. Cardiac rehabilitation. BMJ 2015;351:h5000.
- Shields GE, Wells A, Doherty P, et al. Cost-effectiveness of cardiac rehabilitation: A systematic review. Heart. 2018;104:1403–10.
- British Heart Foundation. National Audit of Cardiac Rehabilitation (NACR) Report 2021. Published Online First: 2021. <https://www.bhf.org.uk/informationsupport/publications/statistics/national-audit-of-cardiac-rehabilitation-quality-and-outcomes-report-2019> (accessed 7 Feb 2020).
- National Institute for Health and Care Excellence. Chronic heart failure in adults: management | Guidance and guidelines | NICE. 2010 <https://www.nice.org.uk/guidance/cg108/resources/cardiac-rehabilitation-services-commissioning-guide304110253/chapter/3-assessing-service-levels-for-cardiac-rehabilitation-services>
- National Institute for Health and Care Excellence. Myocardial infarction: cardiac rehabilitation and prevention of further cardiovascular disease. 2013 <https://www.nice.org.uk/guidance/cg172>
- National Institute for Health and Care Excellence. Unstable angina and NSTEMI: early management. 2013 <https://www.nice.org.uk/guidance/cg94>
- Drummond MF, Jefferson TO. Guidelines for authors and peer reviewers of economic submissions to the BMJ. Br. Med. J. 1996;313:275–83.
- Husereau D, Drummond M, Augustovski F, et al. Consolidated Health Economic Evaluation Reporting Standards (CHEERS) 2022 Explanation and Elaboration: A Report of the ISPOR CHEERS II Good Practices Task Force. Value Heal 2022;25:10–31.