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Comparative effects of different exercise training strategies on health-related quality of life after myocardial infarction: a network meta-analysis of randomized controlled trials

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ADMINISTRATIVE INFORMATION

Support - No.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202630037

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 March 2026 and was last updated on 10 March 2026.

INTRODUCTION

Review question / Objective Among adults recovering from myocardial infarction, how do different structured exercise training strategies used in cardiac rehabilitation compare in terms of improving health-related quality of life during the early recovery phase?

Condition being studied Myocardial infarction remains a leading cause of morbidity worldwide. Although advances in acute management have substantially improved survival, many patients experience persistent limitations in physical functioning, psychological well-being, and social participation.

Exercise-based cardiac rehabilitation is widely recommended as part of secondary prevention following myocardial infarction and has been associated with improvements in functional capacity, cardiovascular outcomes, and patient-reported quality of life. However, multiple exercise approaches are used in clinical practice, including moderate-intensity continuous training, high-

intensity interval training, and resistance training. The comparative effectiveness of these strategies for improving health-related quality of life remains uncertain.

This study aims to synthesize available randomized evidence and compare these exercise modalities using a network meta-analytic approach.

METHODS

Search strategy A systematic search will be conducted in the following electronic databases: PubMed, Embase, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews, ClinicalTrials.gov. The search will cover all records from database inception to March 3, 2026 without language restrictions.

Search terms will be developed around four key domains: (1) myocardial infarction and related terms (e.g., STEMI, NSTEMI); (2) exercise-based cardiac rehabilitation interventions; (3) quality-of-life outcomes; (4) randomized controlled trial design. Boolean operators and database-specific

indexing terms will be applied. Reference lists of relevant systematic reviews and meta-analyses will also be screened to identify additional eligible studies.

Participant or population Adult patients with a confirmed diagnosis of myocardial infarction, including both ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI). Studies enrolling mixed coronary artery disease populations will be included only if outcome data specific to myocardial infarction patients can be extracted.

Intervention Structured exercise-based cardiac rehabilitation programs incorporating one of the following training strategies: high-intensity interval training (HIIT), moderate-intensity continuous training (MICT), resistance training (RT). Exercise interventions must include a clearly described training protocol specifying intensity, frequency, or duration.

Comparator Eligible comparators include: (1) usual care without structured exercise; (2) non-exercise control groups; (3) alternative exercise modalities within the network of interventions.

Study designs to be included Randomized controlled trials evaluating exercise-based rehabilitation programs in patients following myocardial infarction.

Eligibility criteria Studies will be eligible if they meet the following criteria: (1) randomized controlled trial design; (2) adult participants diagnosed with myocardial infarction; (3) evaluation of structured exercise-based cardiac rehabilitation; (4) assessment of health-related quality of life using validated instruments; (5) outcome measurement within approximately three months after initiation of the exercise program. Studies will be excluded if they: (1) include non-MI populations without extractable subgroup data; (2) evaluate non-exercise interventions such as psychological therapy or lifestyle education alone; (3) investigate exercise types outside the predefined network; (4) fail to report usable health-related quality-of-life data; (5) are observational studies, case reports, editorials, or conference abstracts without full data.

Information sources Electronic databases listed above will be searched systematically. Additional studies will be identified through manual screening of reference lists of relevant systematic reviews, citation tracking, and screening of trial registries.

Main outcome(s) The primary outcome is health-related quality of life assessed using validated patient-reported outcome instruments. Examples of eligible instruments include: MacNew Heart Disease Health-Related Quality of Life questionnaire, Short Form-36 (SF-36), Short Form-12 (SF-12). Where multiple time points are available, the assessment closest to 12 weeks after the start of exercise training will be used.

Additional outcome(s) The secondary outcome is participant dropout during the study period, used as an indicator of intervention tolerability and adherence.

Data management Two reviewers will independently screen titles and abstracts, followed by full-text evaluation for eligibility. Data extraction will be performed independently using a standardized form. Extracted variables will include study characteristics, participant demographics, exercise intervention details, comparator descriptions, health-related quality-of-life outcomes, follow-up timing, dropout rates. Disagreements will be resolved through discussion or consultation with a third reviewer.

Quality assessment / Risk of bias analysis The methodological quality of included randomized trials will be assessed using the Cochrane Risk of Bias tool version 2 (RoB 2). This tool evaluates bias across the following domains: randomization process, deviations from intended interventions, missing outcome data, outcome measurement, selective reporting. Two reviewers will independently perform the assessments.

Strategy of data synthesis A network meta-analysis will be conducted to compare the relative effects of different exercise modalities. Analyses will be performed within a frequentist framework using MetaInsight (version 6.4.0; Complex Reviews Support Unit, National Institute for Health Research, London, UK), a web-based platform for network meta-analysis that leverages the netmeta package in R software for conducting frequentist statistical calculations. Effect sizes for health-related quality of life will be expressed as standardized mean differences with 95% confidence intervals. Dropout rates will be analyzed using risk differences.

Subgroup analysis No prespecified subgroup analyses are planned.

Sensitivity analysis Sensitivity analysis will be conducted using a leave-one-out approach in

which individual trials are sequentially removed to evaluate the robustness of pooled estimates and treatment rankings.

Language restriction No language restrictions will be applied during the literature search.

Country(ies) involved Taiwan.

Other relevant information No

Keywords myocardial infarction; cardiac rehabilitation; exercise training; health-related quality of life; network meta-analysis.

Dissemination plans Publication on scientific journal.

Contributions of each author

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