

**Network meta-analysis of the effects of different exercises on cardiac function in patients with myocardial infarction**

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**ADMINISTRATIVE INFORMATION****Support** - Shandong Province Social Science Planning Project (24CTYJ13).**Review Stage at time of this submission** - Data analysis.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY2024110016**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 4 November 2024 and was last updated on 4 November 2024.**INTRODUCTION**

**Review question / Objective** During the rehabilitation of myocardial infarction patients, different exercise methods have different effects on their heart function. Aerobic exercises such as walking, jogging, and swimming can effectively improve patients' cardiopulmonary function. Through regular and sustained aerobic exercise, the heart can pump blood more forcefully, the endurance of the heart muscle can be enhanced, and it can help improve the systolic and diastolic function of the heart of myocardial infarction patients, increase cardiac output, and thus improve overall cardiac function.

Strength training, such as resistance exercises using light to moderate weights, can moderately increase muscle mass and raise basal metabolic rate. This indirectly reduces the burden on the heart and, to a certain extent, helps maintain the normal structure and function of the heart, so that the heart function of myocardial infarction patients

can be optimised with reasonable muscle exercise stimulation.

Physical and mental exercises, such as the stretching movements in yoga and Pilates, can help patients relax their muscles and increase joint mobility. This not only relieves muscle tension caused by long-term illness and physical discomfort, but also improves blood circulation in the body, allowing the heart to work in a smoother circulatory environment, which also plays a positive role in stabilising and restoring the heart function of myocardial infarction patients.

It is still unknown how different exercise methods affect the heart function of myocardial infarction patients, and we aim to determine this using a network meta-analysis.

**Condition being studied** Myocardial infarction, a 'bombshell' in the field of cardiovascular disease, is a serious disease in which coronary artery obstruction leads to a sharp decrease or interruption of blood supply to the heart muscle,

causing myocardial cells to become necrotic due to ischemia and hypoxia. When it occurs, the patient often experiences severe and persistent chest pain that can radiate to the left shoulder, the inside of the left arm, and other areas. There may also be a series of uncomfortable symptoms such as difficulty breathing, nausea, and vomiting. In critical situations, it can even be life-threatening. Patients with myocardial infarction face many challenges in terms of their health, especially risks to their heart function. Necrosis of the heart muscle cells can lead to impaired systolic and diastolic heart function, and the heart cannot pump blood efficiently to the organs and tissues of the body as it normally would. This can lead to serious complications such as heart failure and arrhythmia. Patients may experience a significant decrease in physical strength, reduced exercise tolerance, and fatigue easily. They may become breathless with even the slightest activity, which greatly reduces their quality of life.

Exercise is essential to improving the heart function of patients with myocardial infarction. Exercise can help strengthen the contractility of the heart muscle, improve the pumping function of the heart to a certain extent, and help improve the symptoms of heart failure. Therefore, encouraging myocardial infarction patients to actively carry out a reasonable exercise rehabilitation plan under the guidance of a doctor is a key measure to improve their heart function and quality of life.

## METHODS

**Participant or population** Patients with myocardial infarction.

**Intervention** Different types of exercise, such as aerobic exercise, resistance exercise, mind-body exercise, interval exercise, and mixed exercise.

**Comparator** Conventional drug therapy, and comparisons between the above exercise types were also considered.

**Study designs to be included** Randomized controlled trials (RCTs).

**Eligibility criteria** Participants must be aged 18 or over, and there are no restrictions based on gender or country of origin.

**Information sources** China National Knowledge Infrastructure (CNKI), Wanfang Data, VIP Database, Web of Science, Embase, PubMed.

**Main outcome(s)** Six-minute walk test, left ventricular ejection fraction, left ventricular end-

systolic diameter and left ventricular end-diastolic diameter.

**Quality assessment / Risk of bias analysis** The risk of bias of the included literature was assessed using the revised Cochrane tool for the risk of bias.

**Strategy of data synthesis** Network meta-analysis based on the frequentist framework using STATA 14.0.

**Subgroup analysis** None.

**Sensitivity analysis** Network meta-regression was used to determine the potential impact of baseline severity, age and other factors on the results.

**Language restriction** No.

**Country(ies) involved** China.

**Keywords** Myocardial infarction; exercise training; cardiac function; cardiac rehabilitation.

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