

# INPLASY PROTOCOL

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

**Conflicts of interest:**  
None declared.

## Effect of traditional Chinese exercises on cardiac rehabilitation in heart failure: a Systematic Review and Meta-Analysis of Randomized Controlled Trials

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**Review question / Objective:** The aim of this systematic review and meta-analysis is to assess the potential benefits of traditional Chinese exercise among patients with heart failure. **Eligibility criteria:** The titles and abstracts of all identified articles would be scanned firstly. Full-text articles using randomized controlled trial design, incorporating traditional Chinese exercise intervention, among participants with all types of heart failure diagnosed according to any internationally recognized clinical guidelines would be included. There would be no limits according to age, sex, country, outcome, the type of control groups, or traditional Chinese exercise intervention type, time, frequency or intensity. Studies that lacked data for outcome evaluation or had high bias, duplicate publications, review, comments, letters, editorials, historical article, meta-analysis and guidelines would be excluded.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 September 2021 and was last updated on 09 September 2021 (registration number INPLASY202190027).

### INTRODUCTION

**Review question / Objective:** The aim of this systematic review and meta-analysis is to assess the potential benefits of traditional Chinese exercise among patients with heart failure.

**Condition being studied:** Heart failure (HF) is a complex clinical syndrome consisting of breathless, ankle swelling, fatigue and other accompanied signs due to structural and/or functional heart abnormality. Patients with CHF usually suffer from low exercise tolerance, reduced quality of life

(QOL), mental problem, and high risk of hospitalizations. The 1-year mortality rate and 1-year hospitalization rate of patients with chronic heart failure (CHF) are reported to be 7.2% and 31.9% respectively. The mortality rate may be even higher in patients with heart failure with reduced ejection fraction (HFrEF). The pharmacotherapy is widely recognized to be the cornerstone of treatment for HF, especially for HFrEF. However, a wealth of recent clinical trials report consistent evidence that exercise-based cardiac rehabilitation (ExCR) is safe and effective for patients with CHF. Clinical trials and meta-analyses also show that ExCR can improve exercise tolerance, reduce all-cause and HF-related hospitalizations rate and enhance QOL. The effect of ExCR may rely on the high compliance of the exercise program, traditional Chinese exercise (TCE) could be an alternative option. TCE is a type of low intensity aerobic exercise, which mainly include Tai Chi, Baduanjin (eight silken movements), Yijinjing (changing tendons exercises), Wuqinxi (five animals play), Liuzijue (six tips), and Qi gong. TCEs can be practiced with minimal time investment but without the limitation of place, time or specialized equipment. This characteristic makes TCE to be easily incorporated into daily routines and improves patient adherence as a result. With the increasing global popularity of TCE, it is more widely utilized in cardiac rehabilitation (CR) programs of patients with HF.

## METHODS

**Search strategy:** We will search, with no time restrictions, the following database for relevant English language literature: Pubmed, the Cochrane Central Register of Controlled Trials, Web of science, and Embase. The search term will include: traditional Chinese exercise, tai chi, Baduanjin, Liuzijue, heart failure and so on. We will also search, with no time restrictions, the following database for relevant Chinese language literature: CNKI, WanFang Data, VIP. The search term will

include:太极, 功夫, 八段锦, 六字诀, 心力衰竭等。 .

**Participant or population:** People with stable heart failure (as diagnosed by a clinician, or using any recognized diagnostic criteria) will be included.

**Intervention:** Traditional Chinese exercise was the main intervention (e.g. Tai Chi, Baduanjin, Liuzijue).

**Comparator:** Usual care(following the guidelines for treatment) or usual rehabilitation.

**Study designs to be included:** Randomized controlled trial.

**Eligibility criteria:** The titles and abstracts of all identified articles would be scanned firstly. Full-text articles using randomized controlled trial design, incorporating traditional Chinese exercise intervention, among participants with all types of heart failure diagnosed according to any internationally recognized clinical guidelines would be included. There would be no limits according to age, sex, country, outcome, the type of control groups, or traditional Chinese exercise intervention type, time, frequency or intensity. Studies that lacked data for outcome evaluation or had high bias, duplicate publications, review, comments, letters, editorials, historical article, meta-analysis and guidelines would be excluded.

**Information sources:** Electronic databases, contact with authors, or trial registers.

**Main outcome(s):** 6-minutes walk distance, B-type natriuretic peptide, left ventricular ejection fraction, Minnesota Living With Heart Failure Questionnaire score.

**Quality assessment / Risk of bias analysis:** The risk of bias of included studies would be independently evaluated by two reviewers by the tool with Cochrane Collaboration's recommendation. The following domains would be evaluated: random sequence generation (selection

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bias); allocation concealment (selection bias); blinding of participants and personnel (performance bias); blinding of outcome assessment (detection bias); incomplete outcome data (attrition bias); selective reporting (reporting bias); and other sources of bias.

#### Contributions of each author:

Author 1 - Qinyi Bao.

Author 2 - Shuxin Lei.

Author 3 - Xiaojie Xie.

**Strategy of data synthesis:** The Review Manager software (RevMan 5.3; Cochrane Collaboration) would be used to conduct the meta-analysis. Given all variables in the included studies were continuous data, mean difference (MD) or standardized mean difference (SMD) with corresponding 95% confidence intervals (CI) would be calculated in this study. The MD would be used when all studies assessed the same outcome using the same scale.  $P < 0.05$  was statistically significant. The chi-square test and  $I^2$  statistic would be employed to analyze heterogeneity, with  $P < 0.10$  indicating evidence of heterogeneity. The  $I^2$  statistic would be used to measure the degree of heterogeneity, with suggested thresholds for low (25%–49%), moderate (50%–74%), and high (75%) values. A fixed-effect model would be used in low heterogeneity ( $I^2 < 50\%$ ), a random-effect model would be used for higher heterogeneity.

**Subgroup analysis:** Subgroup analysis would be undertaken to assess the effects of different types of traditional Chinese exercise on physical outcomes, the effects of Different Time of traditional Chinese exercise on physical outcomes, the effects of different time of cardiac rehabilitation on physical outcomes, and the effects of different time of cardiac rehabilitation on BNP.

**Sensitivity analysis:** Sensitivity analysis would be conducted by removing each study individually to estimate the consistency and quality of the results.

**Country(ies) involved:** China.

**Keywords:** Traditional Chinese Exercise, Cardiac Rehabilitation, Heart Failure, Meta-Analysis.