

# INPLASY PROTOCOL

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**Review Stage at time of this submission:** Preliminary searches.

**Conflicts of interest:**  
None declared.

## The effect of multicomponent exercise on functional capacity and frailty syndrome of frail older adult

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**Review question / Objective:** The effect of multicomponent exercise on functional capacity and frailty syndrome of frail older adults.

**Condition being studied:** Frailty, which is a state of increased vulnerability to poor resolution of homeostasis after a stressor event as a consequence of age-related decreased physiological reserve. Exercise is considered a suitable therapy to reverse frailty. Multicomponent exercise is currently one of the most recommended exercises in older people.

**Information sources:** The following electronic databases (from the inception of each database to June 2020) will be searched: PubMed, EMBASE, Web of Science, ScienceDirect, SpringerLink, Cochrane Library, China National Knowledge Infrastructure (CNKI), Wan Fang Database, and VIP Database. Both articles in English and in Chinese will be included. Searchers will examine the list of references for selected papers and will be re-run prior to final analysis.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 02 October 2021 and was last updated on 02 October 2021 (registration number INPLASY2021100005).

### INTRODUCTION

**Review question / Objective:** The effect of multicomponent exercise on functional capacity and frailty syndrome of frail older adults.

**Condition being studied:** Frailty, which is a state of increased vulnerability to poor resolution of homeostasis after a stressor event as a consequence of age-related decreased physiological reserve. Exercise

is considered a suitable therapy to reverse frailty. Multicomponent exercise is currently one of the most recommended exercises in older people.

## METHODS

**Participant or population:** This review will consider older adults 60 years old and older. They are to be defined as pre-frail according to any validated and reliable frailty criteria.

**Intervention:** Interventions will include multicomponent exercise, conducted at home or in community centers. Interventions should consist of at least two kinds of physical exercise, including aerobic, strength, endurance, resistance, coordination, balance and flexibility exercises.

**Comparator:** The participants in the control group will continue their usual daily routine or receive usual care.

**Study designs to be included:** RCT.

**Eligibility criteria:** Inclusion criteria: 1. Study design: Randomized controlled trials (RCTs). 2. Participants: older adults 60 years old and older. They are to be defined as pre-frail according to any validated and reliable frailty criteria. 3. Interventions: Multicomponent Exercise. 4. Comparators: There is no restriction on the comparators. Exclusion criteria: 1. in populations without a clear or validated definition of pre-frailty (e.g. 'functionally limited'), pre-frail populations within a restricted range of health conditions, and hospital or long-term care home populations to increase generalizability to the wider population. 2. The study of multicomponent exercises part of an intervention. 3. other study designs (e.g. cohort, qualitative, non-randomized trials). Inclusion criteria: 1. Study design: Randomized controlled trials (RCTs). 2. Participants: older adults 60 years old and older. They are to be defined as pre-frail according to any validated and reliable frailty criteria. 3. Interventions: Multicomponent Exercise. 4. Comparators: There is no restriction on the comparators.

Exclusion criteria: 1. in populations without a clear or validated definition of pre-frailty (e.g. 'functionally limited'), pre-frail populations within a restricted range of health conditions and hospital or long-term care home populations to increase generalizability to the wider population. 2. The study of multicomponent exercises part of an intervention. 3. other study designs (e.g. cohort, qualitative, non-randomised trials).

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**Main outcome(s):** The main results include frailty, functionality, and cognitive capacity function after the intervention. At least one of the following: frailty phenotype, grip strength, timed up and go test, Gait speed, knee extension, sit-to-stand time, Berg Balance Scale and Mini-Mental State Examination.

**Quality assessment / Risk of bias analysis:** Cochrane Handbook for Systematic Reviews of Interventions will be used to assess by two dependently from seven aspects, including methods of randomization, allocation concealment, performance bias, detection bias, attrition bias, reporting bias, and other bias. The assessment results of each article will be discussed together by them. In case of any disagreement, they will discuss it to reach an agreement. Risk of bias for included studies will be assessed by two review authors independently using the criteria from the Cochrane Handbook for Systematic Reviews of Interventions-RoB tool for randomized trials (including Random sequence generation, Allocation concealment, Blinding of participants and personnel, Blinding of outcome

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assessment, Incomplete outcome data, Selective outcome data reporting, Other sources of bias) and ROBINS-I for non-randomized trials(including Bias due to confounding, Bias in a selection of participants into the study, Bias in the classification of interventions, Bias due to deviations from intended interventions, Bias due to missing data, Bias in the measurement of outcomes, Bias in a selection of the reported result).

#### Contributions of each author:

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**Strategy of data synthesis:** To evaluate each effect size, the data of each of the included articles will be extracted. The standardized difference of means (SMD) and the 95% confidence interval (95% CI) for each of the included meta-analyses will be determined in each of the domains evaluated. Those effect size that is not in SMD, will be converted to this measure. Additionally, the percentage of heterogeneity ( $I^2$ ) and the value of significance will be determined. An  $I^2$  value greater than 50% will be considered as high heterogeneity. All analyses will be performed using the statistical software Review Manager. After that, we will extract the information of effect size and confidence interval of each study to graph in a forest plot.

**Subgroup analysis:** If necessary, we will carry out a subgroup analysis based on the study characteristics, details of intervention, physical activity/exercise type, intensity, frequency, and/or duration.

**Sensitivity analysis:** We will perform sensitivity analysis based on sample size, research design, heterogeneity quality, methodological quality, and statistical model, excluding trials with low quality, and ensure the stability of analysis results.

**Language:** English.

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

**Keywords:** Multicomponent exercise, Frailty, Physical outcomes, Meta-analyse.