

INPLASY PROTOCOL

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Conflicts of interest:
None declared.

Differential influences of training intensity on overweight and obesity in children and adolescents: study protocol for a systematic review and network meta-analysis

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Review question / Objective: We aim to study the differential influences of training intensity on overweight and obesity in children and adolescents.

Condition being studied: Pediatrics, community child health.

Intervention: The interventions will include different training styles: HIIT, high-intensity training (HIT), moderate-intensity interval training (MIIT), moderate-intensity continuous training (MICT), low-intensity interval training (LIIT), and low-intensity training (LIT); the training styles used alone or in combination with other treatments (nutritional therapy, behavioral therapy, or medications for weight loss) will be included.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 July 2022 and was last updated on 08 July 2022 (registration number INPLASY202270043).

INTRODUCTION

Review question / Objective: We aim to study the differential influences of training intensity on overweight and obesity in children and adolescents.

Condition being studied: Pediatrics, community child health.

METHODS

Participant or population: participants aged 5 to 19 years and diagnose overweight or obesity.

Intervention: The interventions will include different training styles: HIIT, high-intensity training (HIT), moderate-intensity interval training (MIIT), moderate-intensity continuous training (MICT), low-intensity interval training (LIIT), and low-intensity training (LIT); the training styles used alone or in combination with other treatments (nutritional therapy, behavioral therapy, or medications for weight loss) will be included.

Comparator: Healthy People.

Study designs to be included: RCT.

Eligibility criteria: We will include only randomized controlled trials in our network meta-analysis since randomized controlled trials are the gold standard of effectiveness evaluation. Trials with crossover design will be included in the first phase results—before the crossover of treatment arms—are separately reported. Trials with an N-of-one design[25] will be excluded since the persistent effect of exercise is difficult to determine, and the wash-out period is, therefore, unlikely to be correctly defined. We will narratively describe the characteristics and RoB results of the included trials. Network meta-analysis will be performed using a frequentist approach, which is developed based on electrical network and graph theory[32]. We will use a random-effect model, and low training intensity will be treated as a common comparator. Effect sizes of high and moderate intensity of training will be calculated in comparison with low training intensity. If the outcomes are with continuous data, the effect sizes will be measured by using standardized mean difference (SMD); if the outcomes are with categorical data, the effect sizes will be measured by odds ratio (OR). The 95% confidence intervals (95% CIs) of the effect sizes will be provided. AP-score—interpreted as the mean possibility of a treatment being the most effective or the most harmful—of a training intensity will also be calculated, and the treatments will be ranked by P-scores.

Information sources: The MEDLINE, EMBASE, the Cochrane Controlled Register of Trials (CENTRAL), and Web of Science.

Main outcome(s): The primary outcome will be systolic blood pressure at the end of the intervention.

Additional outcome(s): The secondary outcomes include other cardiometabolic outcomes, parameters of aerobic fitness, and safety outcomes. The primary outcome will be systolic blood pressure at the end of the intervention.

Quality assessment / Risk of bias analysis: We will use the revised Cochrane risk of bias tool (RoB 2.0) to assess the risk of bias. Two reviewers will test the risk of bias in five domains: bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in the measurement of the outcome, and bias in selecting the outcome reported result. An overall RoB will be predicted based on the rating results of the five domains.

Strategy of data synthesis: We will narratively describe the characteristics and RoB results of the included trials. Network meta-analysis will be performed using a frequentist approach, which is developed based on electrical network and graph theory. We will use a random-effect model, and low training intensity will be treated as a common comparator.

Subgroup analysis: Our primary hypothesis is that participants with higher body mass index have a more minor improvement in primary and secondary outcomes, so we will run subgroup analysis by including participants with only obesity.

Sensitivity analysis: We will perform leave-one-out analysis as sensitivity analysis, which sequentially excludes one study at a time and observes the change of results after removing a study.

Country(ies) involved: China.

Keywords: Pediatrics, education and training, community child health, obesity, meta-analysis.

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