INPLASY PROTOCOL

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None declared.

Effects Between High-Load Resistance Training Versus Low-Load Resistance Training Associated with Blood-Flow Restriction on Muscle Function in Healthy Adults: A Systematic Review and Meta-Analysis

He, XY[1]; Fu, GZ[2]; Zhang, BY[3].

Review question / Objective: **Can the effect of low-load resistance training associated with blood-flow restriction on muscle function achieve the effect of high-intensity resistance training?Participants: Healthy adults (18-60 years). Intervention：Blood Flow Restriction (BFR) intervention refers to a new intervention training method that stimulates muscle growth and improves muscle function with a small training intensity under the condition of compression restriction or short-term intermittent blocking of venous blood flow. Replacing high-intensity resistance training with low-intensity blood flow restriction resistance training can be used as an intervention to improve muscle function while maintaining safety. Comparator：High-Load Resistance Training.**

Condition being studied: **High-intensity resistance training has great safety risks for people, so researchers are committed to finding a high-safety and effective training method in resistance training, such as blood flow restriction training.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 02 October 2022 and was last updated on 02 October 2022 (registration number INPLASY2022100009).

INTRODUCTION

Review question / Objective: **Can the effect of low-load resistance training associated with blood-flow restriction on muscle function achieve the effect of high-intensity resistance training?Participants: Healthy adults (18-60 years). Intervention：Blood Flow Restriction (BFR) intervention refers to a new intervention training method that stimulates muscle growth and improves muscle function with a small training intensity under the condition of compression restriction or short-term**

intermittent blocking of venous blood flow. Replacing high-intensity resistance training with low-intensity blood flow restriction resistance training can be used as an intervention to improve muscle function while maintaining safety. Comparator: High-Load Resistance Training.

Condition being studied: High-intensity resistance training has great safety risks for people, so researchers are committed to finding a high-safety and effective training method in resistance training, such as blood flow restriction training.

METHODS

Search strategy: Name all sources that will be used to identify studies for the systematic review. Sources include (but are not limited to) bibliographic databases, reference lists of eligible studies and review articles, key journals, conference proceedings, trials registers, Internet resources and contact with study investigators, experts and manufacturers. Systematic reviews typically use more than one database. Examples of electronic bibliographic databases include Web of Science, PubMed, Embase. Other database sources include The Cochrane Library. Searches will be re-run prior to the final analysis. unpublished studies will not be sought.

Participant or population: Inclusions: Healthy adults (20-60 years). exclusion: patients.

Intervention: Blood Flow Restriction (BFR) intervention refers to a new intervention training method that stimulates muscle growth and improves muscle function with a small training intensity under the condition of compression restriction or short-term intermittent blocking of venous blood flow. Replacing high-intensity resistance training with low-intensity blood flow restriction resistance training can be used as an intervention to improve muscle function while maintaining safety.

Comparator: High-Load Resistance Training.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: 1) The study was designed as an RCT (Randomized Control Experiment), regardless of whether blinding and allocation hiding were implemented or not; 2) The study subjects were healthy adults aged 18-60 years, regardless of training experience; 3) The included studies included at least two intervention groups: high-load (60%-90% 1RM) resistance training and one group of low-load (20%-50%1RM) BFR training; 4) The LL-BFR exercise regimen requires the same exercise mode as HLT (such as squats, biceps bends, etc.); 5) Outcome indicators include at least muscle strength, muscle circumference and other indicators; 6) Experimental interventions are long-term interventions.

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

Main outcome(s): Maximum strength: 1RM, Post-test; peak torque: Isokinetic tester, Post-test; muscle CSA: ultrasonic, Post-test; muscle girth: Soft ruler, Post-test.

Additional outcome(s): Muscle thickness.

Quality assessment / Risk of bias analysis: The final risk of bias assessment form consisted of Cochrane's risk of bias tool.The risk of bias assessment scores on reporting of judgment items were as follows: (1) Adequate (Bias, if present, is unlikely to alter the results seriously), (2) Unclear (A risk of bias that raises some doubt about the results), and (3) Inadequate (Bias may alter the results seriously) corresponding with (1) low, (2)unclear, and (3) high risk of bias, respectively. The risk of bias analysis comprised four main aspects of reporting: population recruitment, test description, exercise description, and reporting of outcomes.

Strategy of data synthesis: Random effects meta-analysis.

Subgroup analysis: Intervention cycle, Upper and lower limbs.

Sensitivity analysis: Change the merge model, Culling one by one, Excludes a class of literature, Clipping method.

Country(ies) involved: China.

Keywords: BFR, Blood Flow Restriction, KAATSU, occlusion training.

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