INPLASY

Effects of Blood Flow Restriction Training on Lower Extremity Maximum Dynamic Strength and Isometric Muscle Strength among Athletes: A Systematic Review and meta- analysis

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ADMINISTRATIVE INFORMATION

Support - This research received no external funding.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202390051

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 September 2023 and was last updated on 15 September 2023.

INTRODUCTION

Review question / Objective This systematic review and meta-analysis aims to consolidate and extend the findings of previous related systematic reviews by analyzing the effects of blood flow restriction training or blood flow restriction combined with other types of training on maximal dynamic muscular strength (squat-1RM and leg press) and isometric muscular strength among healthy athletes.

Condition being studied Blood flow restriction training, also known as Kaatsu training, utilizes a pressure cuff that wraps around the proximal limb to perform low-intensity training in the presence of ischemia. BFRT at 20-30% of 1RM produces similar results to High Intensity Resistance Training (HIRT) at 70-85% of 1RM and is safer than traditional HIRT.

METHODS

Participant or population Healthy athletes.

Intervention Blood Flow Restriction Training.

Comparator Comparison between BFR group and non-BFR training group, between various exercises combined with BFR, and comparison within group with a single BFR group.

Study designs to be included pre-post test.

Eligibility criteria Athletes with health problems (e.g., injuries); Non-BFR training; Lack of baseline and/or follow-up data; No pre-post testAthletes with health problems (e.g., injuries); Non-Kaatsu training; Lack of baseline and/or follow-up data; No pre-post test.

Information sources Through electronic databases (Scopus, Web of Science, PubMed, EBSCOhost (SportDiscus) and Google Scholar).

Main outcome(s) Blood flow restriction training or blood flow restriction in combination with other types of training improves maximal dynamic

muscle strength and isometric muscle strength of the lower extremity in healthy athletes.

Quality assessment / Risk of bias analysis The risk of bias is assessed at the outcome level using the Cochrane risk of bias tool for randomized trials. A rating of low, high, or unclear risk was given based on performance bias, detection bias, attrition bias, reporting bias, and other biases based on in-text evidence.

Strategy of data synthesis Data are collated in a Windows Excel document and then statistical analyses are performed using RevMan (Review Manager Version 5.3, The Cochrane Collaboration, 2014) for the calculation of the difference in pre-intervention and post-intervention mean and SD values. Both fixed-effects and random-effects models for summary estimates are used dependent on heterogeneity, with mean difference (MD) used for continuous outcomes. Summary measures with corresponding 95% confidence intervals and P values are presented in forest plots. A $P<0.05$ is considered statistically significant.

Subgroup analysis Training type, training duration, training frequency and cuff preesure.

Sensitivity analysis No.

Country(ies) involved Malaysia.

Keywords Blood Flow Restriction; kaatsu; lower extremity muscle strength; Athletes.

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