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Effects of Blood Flow Restriction Training on Sports Performance In Athletes: A Systematic Review with Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 August 2023 and was last updated on 12 August 2023.

INTRODUCTION

Review question / Objective The study aimed to provide a systematic review with meta- analysis of the effects of blood flow restriction training on the physical performance and technical performance in healthy athletes. Study design involve the pre-post test.

Rationale In this study, a systematic review and meta-analysis was conducted by integrating a compilation of studies on the application of blood flow restriction training in the field of athletes from the English language literature database to examine the overall effect of blood flow restriction training on the sports performance in healthy athletes, including physical performance and technical performance, as well as meta-analysis of the results of the performance of specific skills to demonstrate the extensibility of the previous systematic reviews on the topic. Translated with http://www.DeepL.com/Translator (free version).

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 Electronic databases (Scopus, Web of Science, PubMed, EBSCOhost (SportDiscus) and Google Scholar).

Main outcome(s) The results of this study showed that blood flow restriction training provided significant improvements in athletes' power, sprint, agility, balance, aerobic endurance, and skill-specific performance compared to the control group.

Quality assessment / Risk of bias analysis Based on the PEDro scale, the results of the study quality assessment. The PEDro scores for the 14 studies in this review ranged from 4 to 6, in which one publication scored 4, seven scored 5 and six scored 6. Thus, the quality assessment results indicated that the publications used in this review had "moderate" to "good " methodological quality.

Strategy of data synthesis The data collected in this study were organized in Microsoft Excel spreadsheet and RevMan 5.4 was used for data statistics and meta-analysis. We used standardized mean difference (SMD) to calculate effect sizes, and between-group effect sizes (ES) based on pre-intervention and post-intervention means and standard deviations, with 95% confidence intervals (95% CI) for ES (Hopkins et al., 2009). The I2 statistic was used to identify heterogeneity (Higgins et al., 2003), and according to the Cochrane classification, a measure of low heterogeneity of 25% should be modeled as a fixed effect model with $p > 0.01$; whereas a measure of 25-75% and >75%, representing medium and high levels of heterogeneity, respectively, should be modeled as a random effect model, with $p \leq 0.01$. Forests The corresponding 95% CIs for reporting publication bias assessment using funnel plots are shown, and statistical significance was determined when $p < 0.05$.

Subgroup analysis No subgroup analysis.

Sensitivity analysis No.

Country(ies) involved Malaysia.

Keywords Blood Flow Restriction; kaatsu; sports performance ; technical performance; Athletes.

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