

# INPLASY

INPLASY202650041

doi: 10.37766/inplasy2026.5.0041

Received: 8 May 2026

Published: 8 May 2026

## Corresponding author:

Yang YULIN

13050382006@163.com

## Author Affiliation:

1.Department of Physical Education, Kunsan National University, Gunsan, South Korea 2.College of Physical Education, Putian University, Putian Fujian, China 3.School of Sports, Northeast Electric Power University, Jilin, Jilin, China.

## INTRODUCTION

**Review question / Objective** To systematically evaluate the effect of blood flow restriction training with different intermittent durations on the post-activation potentiation of lower limbs, and to clarify the optimal rest interval window and related key training parameters. Population: Healthy adults  $\leq 35$  years; Intervention: Lower limb BFR training; Comparison: Non-BFR training; Outcome: Lower limb PAP; Study design: RCTs. To determine optimal rest interval for PAP.

**Condition being studied** Post-activation potentiation (PAP) of lower limbs induced by blood flow restriction (BFR) training.

## METHODS

**Participant or population** Healthy individuals aged 11–35 years, without chronic diseases, musculoskeletal disorders, or conditions affecting

## The Effect of Blood Flow Restriction Training With Different Intermittent Durations on the Post-Activation Potentiation of Lower Limbs: A meta-analysis

Miao, XR; Chang, WQ; Yang, YL.

## ADMINISTRATIVE INFORMATION

**Support** - No financial.

**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202650041

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 May 2026 and was last updated on 8 May 2026.

exercise performance and post-activation potentiation.

**Intervention** Lower limb blood flow restriction (BFR) training with varied set rest intervals, using specified compressive strength (40%–60% AOP), exercise modes (squat), and intensity (40%–70% 1RM).

**Comparator** Craditional lower limb resistance training or general exercise without blood flow restriction (BFR), matched for exercise mode, intensity, volume, and duration.

**Study designs to be included** Randomized controlled trials (RCTs) published in peer-reviewed journals, with full-text available, investigating the effect of blood flow restriction training on lower limb post-activation potentiation.

**Eligibility criteria** Included: Randomized controlled trials (RCTs); healthy participants aged  $\leq 35$  years; lower limb blood flow restriction (BFR) training versus non-BFR control; outcomes

---

measuring lower limb post-activation potentiation (PAP); full-text in English or Chinese. Excluded: Non-RCTs, reviews, animal studies, participants with chronic diseases, unclear BFR parameters, no quantitative PAP data, duplicate publications.

**Information sources** PubMed, Web of Science, EBSCO, and CNKI databases from inception to November 15, 2025.

**Main outcome(s)** Primary outcome: Post-activation potentiation (PAP) of lower limbs, measured by countermovement jump (CMJ), squat jump (SJ), vertical jump (VJ) height, and muscle power/strength performance.

**Quality assessment / Risk of bias analysis** Cochrane Risk of Bias Tool will be used to assess bias across 7 domains: random sequence generation, allocation concealment, blinding of participants/personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other biases.

**Strategy of data synthesis** Data will be synthesized using random-effects model due to expected heterogeneity. Effect sizes are reported as standardized mean difference (SMD) with 95% confidence intervals (CI). Subgroup analyses will be performed by rest interval, compressive strength, exercise mode, intensity, and outcome measures. Sensitivity analysis and publication bias assessment (funnel plots, Egger test) will also be conducted.

**Subgroup analysis** Subgroup analyses will be performed based on key intervention parameters: rest interval (immediate, 2–4 min, >4 min), compressive strength ( $\leq 40\%$  AOP, 40%–60% AOP,  $\geq 60\%$  AOP), exercise mode (squat, knee extension, combined exercise), exercise intensity ( $\leq 30\%$  1RM, 40%–70% 1RM), and outcome measures (CMJ, SJ, VJ, MVC) to identify sources of heterogeneity.

**Sensitivity analysis** Leave-one-out method will be used to assess the robustness of pooled results. Each study will be sequentially excluded to evaluate the influence of individual trials on overall effect size and heterogeneity.

**Country(ies) involved** China / South Korea -  
1. Department of Physical Education, Kunsan National University, Gunsan, South Korea  
2. College of Physical Education, Putian University, Putian Fujian, China  
3. School of Sports, Northeast Electric Power University, Jilin, Jilin, China.

**Keywords** blood flow restriction training, post-activation potentiation enhancement,, meta-analysis, back squat, rest interval.

#### **Contributions of each author**

Author 1 - Xinrui Miao.

Author 2 - Wenqing Chang.

Author 3 - Yulin Yang.