

EFFECTS OF BARBELL HIP THRUST VERSUS BARBELL SQUAT ON ATHLETIC PERFORMANCE IN ATHLETES: A SYSTEMATIC REVIEW

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ADMINISTRATIVE INFORMATION**Support** - None.**Review Stage at time of this submission** - Data analysis.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202510115

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 January 2025 and was last updated on 26 January 2025.

INTRODUCTION

Review question / Objective The objective of this systematic review is to evaluate the effects of exercises with distinct load vector orientations, specifically the Barbell Squat (vertical) and the Barbell Hip Thrust (horizontal), on key athletic performance metrics, including power, sprint and jumping ability.

Rationale Barbell Hip Thrust and Barbell Squat are widely utilized strength training exercises designed to enhance athletic performance, including strength, power, jumping and sprinting. Due to their distinct biomechanical profiles and support provided by the existing literature, these exercises are thought to have different effects on athletic performance outcomes. However, as far as we could review, a systematic review comparing the effects of these exercises on athletic performance outcomes in both individual and team sport athletes has not yet been published.

Condition being studied Strength training programmes with a minimum duration of 4 weeks that include a comparison between Barbell Hip Thrust and Barbell Squat groups.

METHODS

Search strategy Electronic Databases (PubMed, SportDiscus/EBSCO, Web of Science and Scopus) were searched to identify relevant publications. Keywords and their synonyms were entered in various combinations in title and abstract: (Barbell hip thrust[Title/Abstract] OR hip thrust[Title/Abstract] OR Barbell squat[Title/Abstract] OR squat[Title/Abstract] AND (athletic performance[Title/Abstract] OR strength[Title/Abstract] OR power[Title/Abstract] OR speed[Title/Abstract] OR vertical jump[Title/Abstract] OR sprint[Title/Abstract])). A modified version of the primary search strategy was used to accommodate the requirements of the different databases.

Participant or population Healthy, active athletes aged 14 to 40 years, regardless of sex, participating in either individual or team sports.

Intervention Strength training programmes incorporating distinct groups performing either barbell hip thrust or barbell squat exercises.

Comparator Comparisons will be conducted to evaluate the differences between groups, specifically the barbell hip thrust group, the barbell squat group and the control group (if applicable).

Study designs to be included Randomized controlled trials, comparative experimental studies, and other peer-reviewed, original studies written in English that include parallel or crossover designs.

Eligibility criteria Inclusion criteria: (i) peer-reviewed, original studies written in English that include parallel or crossover designs; (ii) studies that compared the effects of both barbell hip thrust and barbell squat (either front or back squat) on athletic performance outcomes; (iii) healthy, active athletes aged 14 to 40 years, regardless of sex and strength training experience, participating in either individual or team sports; (iv) interventions involving strength training programmes lasting at least four weeks;

Exclusion criteria: (i) studies published in languages other than English, systematic reviews, reliability and validity studies, Post-Activation Performance Enhancement (PAPE) studies and grey literature such as reviews, reports, theses and dissertations; (ii) studies that do not compare the effects of the barbell hip thrust and the barbell squat (either front or back squat) or that exclusively evaluate one of these exercises in isolation; (iii) Athletes who are injured, undergoing rehabilitation, or not actively participating in individual or team sports, as well as physically trained individuals (non-athletes); (iv) programmes with less than 4 weeks intervention.

Information sources Electronic Databases (Medline/PubMed, SportDiscus/EBSCO, Web of Science and Scopus) were searched to identify relevant publications.

If the full text of a study is not available, efforts will be made to contact the authors to request access to the complete manuscript.

Main outcome(s) Examine how exercises with varying directions of force production, performed in the weight room, transfer to athletic performance. Performance metrics will include sprinting ability, jumping ability, maximal strength and power output.

Additional outcome(s) Additionally, we aim to assess whether these differences can provide sport scientists and coaches with evidence-based recommendations to optimize training prescriptions tailored to desired performance objectives.

Data management The Zotero software (version 7.0.11) was utilized to compile and organize studies obtained from various databases. If there was a lack of clear or complete reporting of the required data, the authors of the article were contacted to inquire about it.

Quality assessment / Risk of bias analysis The methodological quality of the included studies will be evaluated using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) model. With the GRADE approach, we classify the quality of evidence into four levels: high, moderate, low and very low.

Strategy of data synthesis Duplicate records were identified and removed by two researchers (DT -RM) based on the eligibility criteria. Subsequently, titles and abstracts were screened, and records not meeting the inclusion criteria were excluded. Full text-articles were then assessed for eligibility according to the predefined criteria. The screening process was not blinded, allowing the reviewers to access the titles and authors of the studies. Finally, only the studies deemed eligible for this review were included.

Subgroup analysis Subgroup analyses are not initially planned for this study. However, depending on the volume and nature of the available literature, subgroup analyses may be conducted based on participant characteristics, intervention attributes, specific outcomes, or methodological aspects of included studies.

Sensitivity analysis When Egger's test showed significant results ($p < 0.05$), a sensitivity analysis was performed. To assess the impact of each study's outcome on the overall conclusions, the results were reanalyzed by excluding each study from the model one at a time.

Language restriction English.

Country(ies) involved Portugal.

Other relevant information None.

Keywords Athletes; Sports Performance; Lower Body Strength; Strength Training; Sport-Specific; Direction of Force Production.

Dissemination plans The study is wished to be published on high-impact study and will be updated on time.

Contributions of each author

Author 1 - Diogo Tamborino - Lead the project, wrote the original manuscript and the statistical report, analyzed and interpreted the data, and revised the original manuscript.

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