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Effect of physical training programs on sprint and change of direction performance among basketball athletes: a systematic review and meta-analysis.

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None.

ADMINISTRATIVE INFORMATION

Support - None.

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

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 20 February 2025 and was last updated on 20 February 2025.

INTRODUCTION

Review question / Objective Does physical training programs significantly improve sprint and change of direction performance among basketball athletes?

Condition being studied Basketball is a high-intensity, intermittent sport that places significant demands on athletes' explosive power, speed, agility, and change of direction (COD) abilities. During games, players frequently perform short-distance sprints, rapid changes of direction, sudden stops, and quick starts, all of which directly impact performance and game outcomes. Therefore, improving sprint speed and change of direction ability is a critical goal in the physical training of basketball athletes.

In recent years, an increasing number of studies have explored the effects of different types of physical training programs (e.g., strength training,

speed training, agility training, and complex training) on the athletic performance of basketball players. However, the findings of these studies are inconsistent. For example, some research suggests that strength training and power training can significantly enhance sprint speed and change of direction ability, while other studies indicate that agility training may be more effective. Additionally, factors such as the duration, intensity, and frequency of training programs may also play a crucial role in determining training outcomes.

Currently, there is a lack of comprehensive research that systematically summarizes and quantitatively analyzes existing studies. Therefore, conducting a systematic review and meta-analysis to integrate existing findings and evaluate the overall impact of physical training programs on sprint speed and change of direction ability in basketball athletes holds significant theoretical and practical importance.

METHODS

Contributions of each author

Author 1 - Gao Ruixuan.

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Participant or population Basketball athletes.

Intervention Strength training, Speed training, Plyometric training.

Comparator The experimental group was trained with plyometric training, and the control group was trained with conventional training or other training.

Study designs to be included RCT.

Eligibility criteria For populations: basketball players, for the intervention must be plyometric exercise, for outcomes, the study should report at least one outcome related to physical performance: for study design, the study must be an RCT.

Information sources PubMed, SCOPUS, Web of science, EBSCOhost, Google scholar, until February, 2025.

Main outcome(s) Plyometric training can improve the athletic performance of basketball athletes, including their change of direction ability and speed capabilities.

Quality assessment / Risk of bias analysis The quality assessment for each study based on the PEDro scale . Nine studies scored between 4 and 7 on the PEDro scale , with one study scoring 10. Four studies provided detailed descriptions of participant sources and inclusion criteria . Seven studies explicitly used random methods for participant allocation , while two studies mentioned the use of allocation concealment . Nine studies incurred deductions due to criteria related to blinding of participants , assessors , and therapists . Two studies explicitly mentioned the number of participants assessed post - trial . All studies scored on all other items of the PEDro scale.

Strategy of data synthesis None.

Subgroup analysis None.

Sensitivity analysis None.

Country(ies) involved China.

Keywords Basketball athletes, Sprint performance, Change of direction performance, physical training.