

INPLASY PROTOCOL

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Does Core Strength Training Affect the Athletic and Skill Performance of Basketball Players? A Systematic Review

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Review question / Objective: This systematic review aimed to provide a comprehensive critical commentary on the current literature that has examined the effects of core strength training on basketball players' athletic and skills and offer recommendations for basketball coaches and further study.

Condition being studied: A basketball game is significantly impacted by the competitive ability, physical fitness, and skills of the basketball players. In past traditional training methods, coaches focus on the training of limbs. This method has resulted in the least obvious effects, after which players do not display a high level of competitive ability. On the contrary, core strength training is based on the theory of the sports chain to complete technical movements. Core strength training is a new concept to improve the transmission of strength, coordinate the combined-use, and control of muscles. Although many media have described the effectiveness of "core training", the scientific community is still uncertain whether core strength can promote the physical fitness and sports performance of basketball players.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 04 October 2021 and was last updated on 04 October 2021 (registration number INPLASY2021100013).

INTRODUCTION

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METHODS

Participant or population: As for inclusion criteria :1. The population must be healthy basketball players, regardless of age and gender.As for exclusion criteria:1. Disabled players should be excluded.

Intervention: Core strength training1. The core strength training as the intervention was involved, core strength training can be carried out on stable or unstable surfaces with unarmed or instruments, and the period can not be less than four weeks.2. The outcome of those selected articles must include the effect of at least one core strength on the athletic or skills of basketball players.

Comparator: The Control group was using traditional training methods or keeping routine training.

Study designs to be included: Single-group trails or Randomized Controlled Trials The study used PICO as the inclusion criteria for these searched articles. For a study to be eligible, each of the following inclusion criteria was met: 1. Articles must be experimental studies focusing on core strength training and basketball players' athletic and skill performance. 2. The population must be healthy basketball players, regardless of age and gender. 3. The core strength training as the intervention was involved, core strength training can be carried out on stable or unstable surfaces with unarmed or

instruments, and the period can not be less than four weeks. 4. The outcome of those selected articles must include the effect of at least one core strength on the physical or skills of basketball players. 5. In addition, this study used the PEDro scale to evaluate the quality of these selected articles.

Eligibility criteria: 1.Articles must be experimental studies focusing on core strength training and basketball players' physical athletic and skill performance. 2.The population must be healthy basketball players, regardless of age and gender. 3.As the intervention was involved, core strength training can be carried out on stable or unstable surfaces with unarmed or instruments, for a period not less than four weeks. 4.The outcome of the articles must include the effect of at least one core strength on the basketball players' physical athletic or skill performance.

Information sources: This study uses the PRISMA statement as a basis for the procedures described herein and was registered with INPLASY [20]. English and Chinese databases were searched in this study, including Ebscohost, Scopus, PubMed, Google Scholar, and China National Knowledge Infrastructure (CNKI) by June 2021. The main keywords used in the retrieval process were: "Core Strength Training" OR "Core-Strength Exercise" OR "Core-training" OR "Postural Stability Training" OR "Core-Stability Exercise" OR "Core-Stability Training" AND "Athletic Performance" OR "Physical Performance" OR "Skills" OR "Offensive Skill" OR "Defensive Skill."

Main outcome(s): Core strength training can help basketball players improve their athletic and skill levels. Especially in the strength, sprint, jump, balance athletic level, and shooting, driving to the hoop skill level.

Quality assessment / Risk of bias analysis: The PEDro scale was used to evaluate the quality of each article.

Strategy of data synthesis: The PRISMA statement was used as a basis for the procedures described herein. The initial search results of 270 publications were 237 after deleting duplicate articles by Endnote software, followed by the second round of deletion, including 77 articles in no full text, 13 articles in non- English and Chinese, 9 articles in non-journal, and one article in unpublished place. In the third step, 137 full-text articles assessed for eligibility were screened. Among them, 124 unrelated articles were deleted according to the topic and abstract, and the remaining 13 articles were carefully screened out. Among them, four articles had no intervention, one article did not use core strength as the main intervention, and one article had unknown subjects.

Subgroup analysis: The study used PICO as the inclusion criteria for these searched articles, which provides a summary of the training characteristics of basketball players using core strength training as an intervention. All studies using core strength training as an intervention, but some studies call core strength training as core training, core stability training, or postural stability training. Four studies used unarmed or equipment to practice core strength, the other two studies only used equipment to practice. In addition, only one study did not put participants on an unstable surface to practice core strength. Experimental duration lasted four weeks, twelve weeks, and 30 months. Core strength training was scheduled twice and three times. In unarmed training, most of the studies used Superman Plank, Sit Ups, and Side Bridge to practice core strength. When practicing with instruments, the study used a variety of instruments to help participants practice core strength, such as Swiss ball, balance instrument, and balance pad. The other two studies did not specify what instruments were used. Some studies describe the core strength training program in detail. Plank training exercises were typically prescribed in 2-3 sets of 8-10 repetitions while using Swiss ball for core strength training was 8-10 sets and 20s or times.

Sensitivity analysis: For the documents to be included and analyzed, they had to fulfill the defined inclusion and exclusion criteria. A search using the previously mentioned strategy were independently done by two authors. The same authors screened the citations and abstracts to identify documents that could be included in the review. In case of potential doubt during selection of one particular article, both authors analyzed the entire article to determine whether the inclusion criteria were met. In the case of a disagreement between the two authors regarding the inclusion criteria, a third author was called to analyze the complete article, for the decision to include.

Country(ies) involved: China, Malaysia.

Keywords: “Core Strength Training” OR “Core-Strength Exercise” AND “Athletic Performance” OR “Physical Performance” OR “Skills” OR “Offensive Skill”

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