

Research on Core Strength Training in Track and Field

Peng Zhang

School of General Education, Shanghai Civil Aviation College, Shanghai, China

Email: 472612079@qq.com

How to cite this paper: Zhang, P. (2025). Research on Core Strength Training in Track and Field. *International Journal of Educational Development*, 1(3), 43-46. ISSN Print: 3104-4263; ISSN Online: 3104-4271. <https://doi.org/10.63313/IJED.9026>

Published: 2025-11-20

Copyright © 2025 by author(s) and Erytis Publishing Limited.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Abstract

Core strength training in Western countries is referred to as core stability training or functional training, which is beneficial for enhancing the muscle strength and stability of track and field athletes. This study focuses on analyzing the concept and role of core strength training, while also highlighting its application in track and field events, thereby obtaining scientifically sound research conclusions. This has a positive impact on enhancing the overall capabilities of track and field athletes.

Keywords

Track and field; core strength; strength training

1. Introduction

The development of China's sports industry has accelerated in recent years, driving the steady growth of track and field events. However, the level of development in China's track and field events lags significantly behind that of other major sports-developing nations. This disparity is closely linked to the training of core strength in track and field athletics. Strength training serves as the foundational support for all sports disciplines, and the outcomes of such training directly impact athletes' endurance and speed. Therefore, it is essential to prioritize core strength training for track and field athletes. Currently, track and field training in China primarily focuses on limb strength, with little emphasis on trunk strength. Therefore, it is necessary to make reasonable adjustments to core strength training in track and field to ensure that athletes can better control and effectively utilize their strength.

2. The Concept of Core Strength Training

The core muscle groups of the human body consist of the gluteus maximus, rectus abdominis, internal obliques, external obliques, and thoracolumbar fascia. Core

strength training focuses on the core regions of the body, concentrating strength development in the hips, shoulders, and legs. This approach enhances training effectiveness, enabling athletes to perform high-difficulty movements swiftly after training. The foundation of core strength training is traditional strength training methods, which target the body's weak points through systematic and comprehensive training. This effectively enhances an athlete's body balance and flexibility, thereby strengthening their athletic performance [1].

3. The role of core strength training

3.1. Improvement of athletes' physical functions

Practical research has shown that core strength training is beneficial for improving the physical performance of track and field athletes, thereby promoting the formation of close connections between the joints and muscles of track and field athletes, and significantly enhancing their own strength. After undergoing core strength training, track and field athletes can utilize their core muscle groups to transmit force to other muscle groups within the body, while reducing the degree of force loss during the transmission process, which is conducive to achieving sustained force generation during athletic performance. The improvement in physical performance of track and field athletes can better demonstrate their endurance and explosive power. Specifically, for short-distance events, athletes can demonstrate good explosive power in a short period of time; for long-distance events, athletes can maintain their initial speed after undergoing core strength training and accelerate before reaching the finish line.

3.2. Prevention of sports injuries

Track and field events require athletes to quickly adjust their center of gravity, which necessitates coordinated muscle activity throughout the body. Smaller muscle groups help stabilize the trunk, ensuring limbs remain in proper alignment. Strong core strength reduces the load on limbs during movement, thereby preventing sports injuries. Muscle strains typically occur when the body is unstable, especially when core strength is insufficient to provide adequate stability, leading to muscle strains. Specifically, during sprinting, when the swinging leg moves backward, it can cause severe loss of body stability. When core strength is insufficient, the internal muscles of the swinging leg must compensate to maintain balance. This results in the swinging leg being unable to fully relax during the backward swing, leading to muscle strains when force is applied. Core strength training is beneficial for preventing sports injuries.

3.3. Coordination of physical forces

Core strength training can fully mobilize the internal forces within an athlete's body,

guiding them to develop coordination and thereby enhance the impact force of their output[2]. Track and field events place high demands on an athlete's physical strength and require coordinated effort from their muscle groups and joints to perform. Traditional strength training methods cannot provide targeted training for an athlete's strength, whereas core strength training helps track and field athletes achieve coordination between their limbs and body, thereby improving their physical flexibility. [3]

4. The Application of Core Strength Training in Track and Field Events

4.1. Training in a stable state

Static exercise training. In the early stages of core strength training, the focus is primarily on static exercise training. This type of training allows track and field athletes to genuinely experience the force generated by their core muscle groups, thereby enhancing their center of gravity stability. As static exercise training progresses, athletes can transition from using both arms to using one arm, and from using both feet for support to using one foot for support. This facilitates the goal of liberating the limbs. Additionally, track and field athletes must maintain a certain level of stability in their body and posture during movement. After completing the above exercises, equipment and devices can be introduced into training to create unstable conditions, thereby stimulating the involvement of muscle groups and neural pathways during movement, ultimately enhancing the athlete's limb stability.

Unloaded exercise training. When track and field athletes' overall fitness and physical abilities gradually improve, unloaded exercise training can be implemented. In other words, after track and field athletes have completed the initial training of adjusting from two arms to one arm and from two feet to one foot, they can then train the other limbs that are not in use. The number and difficulty of training sessions should be adjusted reasonably based on the athletes' individual circumstances to stimulate their core strength.

4.2. Training in an unstable state

Static exercises. Static exercise training in unstable conditions facilitates the coordinated participation of athletes' nervous systems and deep muscles. This typically involves introducing unstable equipment and devices into stable training processes. Specifically, this involves adding unstable factors or dynamic movements to suspension training to deeply stimulate the nervous system and muscle groups in the athletes' core areas. This training is suitable for track and field athletes in excellent physical condition. At the same time, track and field athletes can perform resistance training exercises in unstable conditions.

Free weight training. Free weight training conducted in an unstable state is generally based on unstable equipment or devices combined with kettlebells, dumbbell

benches, resistance bands, etc. This training can significantly stimulate the deep core muscle groups within the athlete's body. Specifically, exercises such as squats or barbell squats performed on a balance board can help achieve good training results.

5. Conclusion

Due to the accelerating pace of development in sports at the present stage, this has placed higher demands on the comprehensive abilities and physical fitness of track and field athletes. Therefore, it is necessary to conduct an in-depth analysis of core strength training, particularly examining its impact on track and field athletes during training, and to develop reasonable and scientifically sound training programs. This approach aims to enhance the physical fitness of track and field athletes and improve the efficiency of various body parts.

References

- [1] Zeng Deming. Research on Core Strength Training in Track and Field [J]. Sports Fashion. 2019. 000(002):62-62.
- [2] Sudan Rui. Research on Core Strength Training in Track and Field [J] (Path to Success. 2018. 590(34):89.
- [3] Zhong Xinsheng, Yao Lu, Zhang Dong. Effect of super-isometric training on the explosive power of lower limbs of young athletes [J]. Journal of Minnan Normal University (Natural Science Edition), 2015, 28(03):94-99.