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Influence of Unsteady Training on the Changing Ability of Adolescent Badminton Players

Xin Zhao

Xi'an Shiyou University, 710065, Xi'an, Shaanxi, China

ABSTRACT

Badminton has complex action characteristics, and there are both opportunities and challenges in the development of Chinese sports. The ability to change direction of badminton players is one of their important abilities to successfully complete the pace on the court and effectively return the ball. Currently, unstable training has made a certain appearance in athlete training, which can effectively improve the core strength and balance ability of athletes. This study aims to explore the influence of unstable training on the ability of adolescent badminton players to change direction. Method: The subjects were divided into two groups: experimental group and control group. The experimental group received training under unstable conditions, while the control group received training under stable conditions. The experiment lasted for 6 weeks. And comparative analysis.

KEYWORDS

Instability Training; Teenagers; Badminton; Deflection Ability.

1. INTRODUCTION

1.1. Background of the Topic

The competition characteristics of badminton determine that the ability to change direction is an important factor affecting the performance of badminton players.[1] Badminton players need to complete 5-12 shots in each round, and the fast pace of the game requires badminton players to not only have a good technical and tactical level but also a good physical condition, especially the ability to move quickly and change direction. Unstable training, as a type of balance training on unstable surfaces, has been shown in many studies to effectively enhance the ability to maintain body stiffness and balance, as well as overcome inertia. Among the many factors affecting the direction change ability of adolescent badminton players, balance ability is undoubtedly one of the most important factors. The athletic ability of teenagers directly determines the future position of China in the world badminton arena. The adolescent stage is the most crucial stage for the growth and development of the human body, and it is also a sensitive period for improving physical fitness. Therefore, intervention training during the adolescence period is of great significance. Related experiments show that 6 weeks of unsteady training combined with rapid stretch compound training not only improves the direction-changing ability of male college badminton players but also enhances their balance ability and lower limb reaction strength. Experiments have also shown that 8 weeks of unstable training can improve tennis players' dynamic and static balance ability and the stability of forehand and backhand. Some scholars have found that after 6 weeks of balance and enhanced combined training for professional badminton players, the SEMO test, 5-0-5 COD test, YBT, and RSI tests have all shown significant improvements. Additionally, foreign scholars have found that balance training for children can improve motor function, and the combination of enhanced and balance activities can

improve static balance, dynamic balance, and strength. For badminton, an athlete's core strength directly affects their competitive level, and unstable training can effectively improve athletes' core strength and balance ability. [2]Therefore, this study aims to investigate the effect of unstable training on the direction change ability of adolescent badminton players, providing a theoretical basis for the formulation of training programs for adolescent badminton athletes.

2. LITERATURE REVIEW

Badminton's characteristics make directional change ability a critical factor for competitive success. Studies have shown that combining 6 weeks of unsteady training with rapid stretch composite training can significantly improve the directional change ability, balance, and lower body strength of male university badminton players. [3]Additionally, 8 weeks of unsteady training has been proven to enhance tennis players' balance and stability. Studies on elite badminton players have found significant improvements after 6 weeks of combined balance and enhancement training, with substantial gains in SEMO tests, 5-0-5 COD tests, YBT, and RSI tests. Unsteady training has a significant effect on improving the directional change ability of adolescent badminton players, with one study showing that players who underwent unsteady training outperformed those who underwent traditional stable training in tests of agility and balance.Overall, unsteady training can improve the balance and lower body strength of badminton players, and is more effective than stable training, although it is rarely applied in badminton. [4]Therefore, this study investigates the influence of unsteady training on the directional change ability of adolescent badminton players.

3. RESEARCH SUBJECTS AND METHODS

3.1. Research Subjects

This study focuses on the effect of unsteady training on the directional change ability of adolescent badminton players.

3.2. Research Methods

3.2.1. Experimental Subjects and Grouping

This experiment involved 12 healthy male adolescents from a club in Xi'an, Shaanxi Province. The subjects were randomly divided into two groups: the experimental group and the control group, each consisting of 6 subjects. The basic characteristics of the two groups are presented in Table 1.

Table 1. Basic Information of Subjects

Group	Age (years)	Height (cm)	Weight (kg)
Experimental Group	12.1 ± 0.62	153.37 ± 5.11	54.35 ± 4.38
Control Group	12.43 ± 0.31	156.18 ± 3.24	52.31 ± 3.25

3.2.2. Experiment Duration and Location

Duration: 6 weeks, with 3 training sessions per week, each lasting 60 minutes (total of 18 sessions).

Location: Aiyu Club, Xi'an, Shaanxi Province.

3.2.3. Experiment Control

To ensure the validity and authenticity of the data, all training sessions were monitored by the researcher and a student majoring in physical education. Both groups followed identical training methods, with the only difference being the unstable training condition for the experimental group.

3.2.4. Training Plan

The training was divided into two stages:

Stage 1 (Weeks 1-3): Basic exercises such as plank holds and Swiss ball back bridge.

Stage 2 (Weeks 3-6): More advanced exercises on unstable surfaces, including BOSU ball lunges.

3.2.5. Test Indicators and Methods

T-Drill Running Test: Time taken to complete the T-drill course.

Hexagonal Jump Test: Time taken to complete the hexagonal jump pattern.

Y-Balance Test: Distance moved by the foot in three directions.

4. RESEARCH RESULTS

4.1. Pre-test Analysis

Pre-experiment results for both groups showed no significant differences in T-drill running, hexagonal jump, or Y-balance scores.

4.2. Post-test Analysis

Post-experiment results showed significant improvements in T-drill running, hexagonal jump, and Y-balance for the experimental group.

5. DISCUSSION AND ANALYSIS

Both unsteady and stable training improved the directional change ability of the adolescent badminton players, but unsteady training led to more significant improvements in T-drill running, hexagonal jumping, and Y-balance tests. This suggests that unsteady training is more effective in enhancing the directional change ability of adolescent badminton players.

6. CONCLUSION AND SUGGESTIONS

6.1. Conclusion

Both unsteady and stable training improved the directional change ability of adolescent badminton players.

Unsteady training provided a more significant improvement than stable training.

6.2. Suggestions

Unsteady training, using innovative equipment and different exercises, can better engage adolescent players in training. Coaches should incorporate unsteady training into regular badminton training to improve balance and technical skills, contributing to the development of future badminton talents.

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