

EFFECTS OF JUMP ROPE TRAINING ON EXPLOSIVE POWER IN BADMINTON PLAYERS



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EFEITOS DO TREINAMENTO DE SALTO DE CORDA SOBRE O PODER EXPLOSIVO EM JOGADORES DE BADMINTON

EFFECTOS DEL ENTRENAMIENTO DE SALTO CON CUERDA SOBRE LA POTENCIA EXPLOSIVA EN JUGADORES DE BÁDMINTON

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ABSTRACT

Introduction: After implementing the national fitness program in China, badminton has attracted the participation of the general public, consolidating itself as a national weight loss program. **Objective:** Study the effects of jump rope training on explosive power in badminton players. **Methods:** Thirty-six young athlete volunteers were selected and divided into groups A and B to conduct an intervention study on jump rope training. All students' intensity and exercise time were strictly controlled to ensure the validity of the results. Validated fitness tests, including the endurance index, were used to check the impacts of training. **Results:** There was no significant difference in endurance and speed between students in groups A and B before the experiment ($P>0.05$). The endurance and speed of students in groups A and B after the experiment were significantly different ($P<0.05$). **Conclusion:** Adding jump rope training to badminton physical training can effectively improve the explosive power and speed in the lower limbs of its athletes. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Badminton; Physical Education and Training; Endurance Training.

RESUMO

Introdução: Após a implementação do programa nacional de fitness na China, o badminton tem atraído a participação do público geral, consolidando-se como um programa de emagrecimento nacional. **Objetivo:** Estudar os efeitos do treinamento de salto de corda sobre o poder explosivo em jogadores de badminton. **Métodos:** Selecionou-se 36 jovens atletas voluntários que foram divididos em grupo A e grupo B para realizar um estudo de intervenção sobre o treinamento em salto de corda. A intensidade e o tempo de exercício de todos os alunos foram estritamente controlados visando garantir a validade dos resultados. Para verificar os impactos do treinamento, utilizou-se testes de aptidão física validados, incluindo o índice de resistência. **Resultados:** Não houve diferença significativa na resistência e velocidade entre os alunos do grupo A e do grupo B antes do experimento ($P>0,05$). A resistência e a velocidade dos alunos do grupo A e do grupo B após a experiência foram significativamente diferentes ($P<0,05$). **Conclusão:** Adicionar o treinamento de salto em cordas ao treinamento físico de badminton pode efetivamente melhorar o poder explosivo e a velocidade nos membros inferiores de seus atletas. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Badminton; Educação Física e Treinamento; Treino de Resistência.

RESUMEN

Introducción: Tras la implantación del programa nacional de fitness en China, el bádminton ha atraído la participación del público en general, consolidándose como un programa nacional de pérdida de peso. **Objetivo:** Estudiar los efectos del entrenamiento con cuerda para saltar sobre la potencia explosiva en jugadores de bádminton. **Métodos:** Se seleccionaron 36 jóvenes atletas voluntarios y se dividieron en el grupo A y el grupo B para realizar un estudio de intervención sobre el entrenamiento de salto de cuerda. La intensidad y el tiempo de ejercicio de todos los alumnos se controlaron estrictamente para garantizar la validez de los resultados. Se utilizaron pruebas de aptitud física validadas, incluido el índice de resistencia, para comprobar los efectos del entrenamiento. **Resultados:** No hubo diferencias significativas en la resistencia y la velocidad entre los estudiantes del grupo A y del grupo B antes del experimento ($P>0,05$). La resistencia y la velocidad de los estudiantes del grupo A y del grupo B después del experimento fueron significativamente diferentes ($P<0,05$). **Conclusión:** Añadir la práctica de salto con cuerda al entrenamiento físico del bádminton puede mejorar eficazmente la potencia explosiva y la velocidad de los miembros inferiores de sus atletas. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptorios: Badminton; Educación y Entrenamiento Físico; Entrenamiento de Resistencia.



INTRODUCTION

Since the implementation of the national fitness program in China, badminton has attracted the active participation of the general public with its own unique charm. Relevant surveys have found that among many sports, badminton is the second most popular sport following "brisk walking".¹ Specifically, badminton is a competitive sport. Therefore, more and more people are learning badminton. How to let badminton learners learn badminton in the shortest time, and mastering the correct technical movements is the key point that badminton teachers need to understand and master.²

It is very important for a good badminton player to have good strength qualities, in badminton, athletes use footwork displacement and perform various technical movements on the court need strength quality as the basis.³ B Zgür pointed out that in badminton, a player's lower body explosive power level directly affects his displacement speed and ability to change direction on the court, therefore, explosive power plays an important role in badminton performance.⁴ Olesen J S pointed out that the explosive power of lower limbs in badminton is mainly manifested in the fast movement of footwork on the court, and the fast movement of footwork on the court is the core ability of badminton.⁵ MA Gómez, selected 27 undergraduate badminton athletes to conduct experiments to explore the effect of vibration training on the explosive power of lower limbs, the experimental subjects were divided into three groups: 30Hz, 45Hz and the control group, respectively, for 9 weeks of training, the study showed that the two groups using vibration training were better than the control group in terms of lower body explosive power and specific movement speed, among them, the 45Hz vibration training has the greatest improvement on the explosive power of the lower limbs.⁶ Passos P conducted a 6-week centripetal combined eccentric strength training for 21 badminton players who reached the national second level, according to the conclusion, it is pointed out that both the fast group and the slow group have ideal effects on improving the strength of the lower limbs, and the fast group has better effects on the improvement of the two special abilities of badminton four-point touch and standing long jump than the slow group.⁷

In conclusion, there are few studies that have investigated the effect of string interference on the lower extremity of tennis players on the lower extremity of soccer players, and verify its training effect on the special ability combined with the footwork test, in order to provide more reference for the application of rapid stretching compound training in badminton training.

METHOD

Documentation method

Through literature search, the conference reports related to rope skipping and badminton training were consulted on academic journals such as CNKI, VIP, and Wanfang, dissertation and other materials; Access to specific books related to research through university libraries and libraries; Enter keywords such as "speed", "endurance", "skip rope", "badminton training" and other keywords in Baidu Academic website and Google Scholar to search. The above-mentioned relevant data are sorted and analyzed, and the reading research is carried out on this basis, which provides a solid theoretical basis for this research.⁸

Experimental method

Subjects: 36 badminton students from a university specializing in badminton, all the students who participated in the test have studied badminton special courses for more than one year, and the badminton foundation is very solid. All students were divided into Group A and Group B by lottery, with 18 students in each group. Among them, there

are 11 boys and 7 girls in group A, and 11 boys and 7 girls in group B, the proportion of male and female students in the two groups is balanced. The students in group A were trained in accordance with the previous badminton training methods, and the students in group B were trained in the pattern skipping training method.

Statistics method

The whole experimental process is divided into different stages, and statistical analysis is carried out on the training progress and training data of athletes each time, and finally a conclusion with high accuracy is drawn.⁹

Control of experimental related factors

In the process of this experiment, the interference environmental factors that may appear outside are strictly controlled, and all the staff who participated in the test in this experiment have been standardized training. At the same time, formulate scientific and unified testing standards, ensure that the measurement personnel involved in the test, the selected test site and the test method are exactly the same before and after the experiment. When allowing students to perform physical fitness training such as speed endurance, reasonable methods should be used to guide students to carry out necessary warm-up activities, prevent possible sports injuries to the greatest extent possible. At the same time, in order to ensure the validity of the whole experimental results, the exercise intensity and exercise time of all students participating in the experiment are strictly controlled.¹⁰ During the whole experiment period, the students in group A and group B only carried out physical fitness training such as speed endurance arranged by the badminton curriculum, in other time periods, they no longer participate in any form of training, and the training methods are shown in Table 1.

Ethical Compliance

Research experiments conducted in this article with animals or humans were approved by the Ethical Committee and responsible authorities of Chengdu University following all guidelines, regulations, legal, and ethical standards as required for humans or animals.

RESULTS

Analysis of the basic situation of the two groups of students before the experiment

The basic information on the age and gender of the two groups of students is shown in Table 2.

According to the data in the Table above, there was no significant difference in the basic physical information such as age, height, weight, etc. between the students in group A and group B before the experiment, $P < 0.05$.

Table 1. Training program.

| Time | Basic form | Integrate project in basic training |
|------------|------------------|---|
| 1-4 Weeks | Single jump rope | Jump, lunge, jump |
| | Double jump rope | |
| 5-8 Weeks | Double jump rope | Sucking Leg Jump, Kick Jump, Ipsilateral Hip Jump |
| 9-12 Weeks | Triple jump | Lunge jumps, high leg jumps, cross-crotch jumps |

Table 2. Comparison of the basic situation of students in group A and group B (n=18).

| Measurement standard | Group A | Group B | P |
|----------------------|-------------|-------------|------|
| Age (years) | 20.37±1.12 | 20.56±1.05 | 0.05 |
| Height (cm) | 175.24±6.55 | 176.33±7.64 | 0.62 |
| Weight (kg) | 70.65±15.33 | 71.22±16.68 | 0.59 |

The test results of the speed endurance index of the two groups of students before the experiment

In order to truthfully reflect the real speed endurance of the students in Group A and Group B, relevant tests were carried out before the experiment, such as 400m, 5 round-trips of T-shaped running, and 20 round-trips of killing the Internet, using t test, the test results are shown in Table 3.

From the results in Table 3, it can be seen that the average scores of group A and group B in the 400m before the experiment were 92.22 ± 16.23 , 91.25 ± 16.86 , t was 0.12, $P > 0.05$, there is no significant difference between the two groups; It can be seen from this that there is no significant difference in the related speed endurance indexes of students in group A and group B before the experiment, so the following research can be carried out.

The test results of the speed endurance index of the two groups of students after the experiment

Comparing the speed endurance of two groups of students after the experiment, mainly from the specific time it took for the two groups to complete 400m, 5 round trips in T-shape, and 20 round trips to kill the Internet, the specific results are shown in Table 4.

From the results sorted in Table 4, it can be seen that the average scores of the students in group A and group B after the experiment were 87.63 ± 17.53 and 80.11 ± 11.23 respectively, $P < 0.05$, and there was a significant difference in the measurement results between the two groups; It can be seen that there are significant differences in the related speed endurance indexes of students in group A and group B in the experiment, which confirms the feasibility of the trick rope skipping training method.

DISCUSSION

The influence of rope skipping on the speed quality of badminton players: If we think that the foundation of all sports is strength quality, then the core foundation of badminton is speed quality. For a professional badminton player, with better speed, he can make better assaults, have the courage to take the initiative to attack, and have the strength to win. In a real game, speed has a lot of influence on the final result. The effect

Table 3. Test results of speed endurance index of students in group A and group B before the experiment (n=18).

| Measurement standard | Group A | Group B | t | P |
|--------------------------------|-------------------|-------------------|-------|------|
| 400m (s) | 92.22 ± 16.23 | 91.25 ± 16.86 | 0.12 | 0.88 |
| T-run 5 round trip(s) | 72.37 ± 6.36 | 72.56 ± 6.25 | -0.66 | 0.40 |
| Kill Internet 20 round-trip(s) | 80.24 ± 11.26 | 79.86 ± 13.26 | 0.16 | 0.77 |

Table 4. Test results of speed endurance index of students in group A and group B after the experiment (n=18).

| Measurement standard | Group A | Group B | P |
|--------------------------------|-------------------|-------------------|-------|
| 400m (s) | 87.63 ± 17.53 | 80.12 ± 11.23 | 0.001 |
| T-run 5 round trip(s) | 69.65 ± 7.02 | 61.25 ± 7.53 | 0.003 |
| Kill Internet 20 round-trip(s) | 77.64 ± 11.36 | 70.23 ± 12.33 | 0.002 |

of pattern skipping on the endurance quality of badminton players: The ability of the body to fight fatigue during prolonged exercise is what we call endurance. Rope skipping has great variability and rich training combinations, through this combination training mode, athletes can complete high-efficiency training in a short time, and their endurance quality can be significantly improved.

CONCLUSION

The endurance and speed of the students in group A and group B after the experiment were significantly different, $P < 0.05$. Therefore, it is concluded that scientific and reasonable pattern skipping training can effectively improve the speed quality and endurance quality of badminton players, and can also promote the physical skills of athletes to be effectively improved to a certain extent. Because the rope skipping method is used in the training, more requirements are put forward for the athletes' speed, endurance and strength during the whole training process, guide the athletes to carry out standardized operations according to their own conditions, and adopt the step-by-step method of training from shallow to deep, from easy to difficult, and the final exercise effect will be more obvious.

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