

INFLUENCE OF AEROBIC AND ANAEROBIC SPORTS ON THE TRAINING EFFECTS OF TABLE TENNIS PLAYERS

INFLUÊNCIA DOS ESPORTES AERÓBICOS E ANAERÓBICOS SOBRE OS EFEITOS NO TREINO DOS JOGADORES DE TÊNIS DE MESA

INFLUENCIA DE LOS DEPORTES AERÓBICOS Y ANAERÓBICOS EN LOS EFECTOS DEL ENTRENAMIENTO DE LOS JUGADORES DE TENIS DE MESA



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Ying Guo¹ 
(Physical Education Professional)

1. Guangdong Polytechnic Institute, Department of Public Education, Guangzhou, China.

Correspondence:

Ying Guo
Guangzhou, 510091,
China. 510091.
guoying15915765176@163.com

ABSTRACT

Introduction: The weakness of cadence and rotation speed in table tennis brings new challenges to the physical strength of young players, presenting a redoubled effort for physical fitness and stability of the shot movements. **Objective:** Study the influence of aerobic and anaerobic exercise on the training effect of table tennis players. **Methods:** 27 young table tennis players aged 9-17 years old from China Table Tennis Institute were selected as the experimental objects. They were divided into 14 in the experimental group for 12 weeks of core strength training and 13 in the control group for 12 weeks of routine physical training. **Results:** There was no significant difference in the control group before and after the experiment ($P > 0.05$); there was no significant difference in core strength between the experimental group and the control group before the experiment ($P > 0.05$). **Conclusion:** After the experiment, the core strength of both groups of young table tennis players improved, and the core strength of the experimental group improved significantly from the fourth level to the fifth level of body posture table maintenance. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Endurance Training; Resistance Training; Racquet Sports.

RESUMO

Introdução: A debilidade da cadência e da velocidade de rotação no tênis de mesa traz novos desafios à força física dos jovens jogadores, apresentando um redobrado esforço para a aptidão física e a estabilidade dos movimentos de tacada. **Objetivo:** Estudar a influência do exercício aeróbico e anaeróbico no efeito de treinamento dos jogadores de tênis de mesa. **Métodos:** 27 jovens jogadores de tênis de mesa de 9-17 anos de idade do Instituto de Tênis de Mesa da China foram selecionados como os objetos experimentais. Eles foram divididos em 14 no grupo experimental durante 12 semanas de treinamento de força central e 13 no grupo de controle durante 12 semanas de treinamento físico de rotina. **Resultados:** não houve diferença significativa no grupo de controle antes e depois do experimento ($P > 0,05$); não houve diferença significativa na força do núcleo entre o grupo experimental e o grupo de controle antes do experimento ($P > 0,05$). **Conclusão:** Após o experimento, a força central dos dois grupos de jovens jogadores de tênis de mesa melhorou, e a força central do grupo experimental melhorou significativamente, do quarto nível para o quinto nível de manutenção da mesa de postura corporal. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Treino Aeróbico; Treinamento de Força; Esportes com Raquete.

RESUMEN

Introducción: La debilidad de la cadencia y de la velocidad de rotación en el tenis de mesa plantea nuevos desafíos a la fuerza física de los jóvenes jugadores, presentando un esfuerzo redoblado para la aptitud física y la estabilidad de los movimientos de tiro. **Objetivo:** Estudiar la influencia del ejercicio aeróbico y anaeróbico en el efecto del entrenamiento de los jugadores de tenis de mesa. **Métodos:** Se seleccionaron 27 jóvenes jugadores de tenis de mesa de entre 9 y 17 años del Instituto de Tenis de Mesa de China como objetos experimentales. Se dividieron en 14 en el grupo experimental para 12 semanas de entrenamiento de fuerza central y 13 en el grupo de control para 12 semanas de entrenamiento físico rutinario. **Resultados:** no hubo diferencias significativas en el grupo de control antes y después del experimento ($P > 0,05$); no hubo diferencias significativas en la fuerza central entre el grupo experimental y el grupo de control antes del experimento ($P > 0,05$). **Conclusión:** Después del experimento, la fuerza central de ambos grupos de jóvenes jugadores de tenis de mesa mejoró, y la fuerza central del grupo experimental mejoró significativamente desde el cuarto nivel hasta el quinto nivel de mantenimiento de la postura corporal de la mesa. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Entrenamiento Aeróbico; Entrenamiento de Fuerza; Deportes de Raqueta.



INTRODUCTION

Table tennis is mainly a process of transmitting information from audio-visual nerve to motor nerve. Different people have different physical conditions, and their reaction ability and reflection speed are also different. The reaction speed of normal people is generally about 0.4 seconds. What table tennis players need to do is to shorten this time limit and raise it to 0.1 seconds or less in order to keep up with the opponent's speed.¹ Therefore, the first thing a coach should do is to apply the multi ball training method in training. This common and effective method sends the ball to the practitioner through a stable and continuous rhythm, so that he can gradually adapt to the fast rhythm of coming and receiving the ball, and cultivate his sensitivity to dynamic objects. Under the principle of fixed point, fixed height and fixed line, the players are more proficient in this ball path, so as to make corresponding changes.²

In table tennis, coaches should see the importance of physical fitness, which shows higher sports significance in long-term training and confrontation. An excellent table tennis player needs all-round high ability and quality, including the most important physical fitness. For some difficult balls, he can maintain strong confrontation ability in repeated and rapid movement. Therefore, the coach should combine the relevant practical theories of training to meet the requirements of ability improvement in the process of adapting to the high-speed and high-intensity development of modern table tennis. Physical education can also improve athletes' interest in training by trying other sports methods, using equipment training methods, and changing the single and boring training feeling, so as to further improve their physical quality. Under the development of such physical education, the training effect of table tennis can be better guaranteed. The overall training can also diversify and effective physical training, so as to improve the training effect.³

Experimental subjects and methods

The subjects of this study are 27 athletes aged 9-17 in the youth class of China table tennis Institute. Numbered before the names of male and female students, the odd numbered young table tennis players were divided into the experimental group, a total of 14 (9 male athletes and 5 female athletes) for core strength training; Even numbered juvenile table tennis players were divided into the control group, a total of 13 (8 male athletes and 5 female athletes) for routine physical training.⁴

Experimental method

This experiment is mainly to study the impact of core strength training on the hitting quality of young table tennis players. The experiment is divided into three steps: The first step is to summarize the basic information of the athletes in the experimental group and the control group, pre-test the hitting maze, rotation and falling point of the athletes' eight level abdominal bridge, table tennis forehand up spin ball and forehand down spin ball, and input and sort out these information and data; The second step is to carry out experimental intervention. The control group received 12 weeks of routine physical training and the experimental group received 12 weeks of core strength training; The third step, after 12 weeks of intervention, the athletes were retested for Grade 8 abdominal bridge and batting maze, rotation and landing point.⁵

Mathematical Statistics

In this study, the basic information, measured core strength index data and hitting quality index data of athletes in the experimental group and the control group were collected and summarized by Excel. The statistical analysis related to the data was performed by SPSS 22.0 software, and the data results were expressed by the mean standard deviation ($M \pm SD$).

Experimental results

Taking the core strength data before and after the experiment as the dependent variable, the results of repeated measurement variance of two factors were analyzed. The interaction effect of the two independent variables of measurement time (before and after twice) and the grouping of experimental objects (experimental group and control group) on core strength is significant ($F(1,5) = 84.07, p < 0.01$).⁶ The results of simple effect analysis are as follows.

Before the experiment, the difference analysis results of Grade 8 abdominal bridge scores between the experimental group and the control group are shown in Table 1.

It can be seen from Table 1 that the comparison results of Grade 8 abdominal bridge scores of young table tennis players in the experimental group and the control group before the experiment: Before the experiment, there was no significant difference in the core strength of table tennis between the experimental group and the control group ($P > 0.05$), which met the experimental requirements of this study. From the average of the eight level abdominal bridge scores of the two groups of athletes before the experiment, it can be seen that the eight level abdominal bridge scores of the youth table tennis players of China table tennis Institute are high, which has reached the eight level abdominal bridge dimension, and the fourth level (6 points) of the body posture table, indicating that the core strength foundation of the youth table tennis players is strong.⁷

Table 2 shows the difference analysis results of Grade 8 abdominal bridge scores of juvenile table tennis players before and after the experiment in the control group.

It can be seen from Table 2 that there is no significant difference in core strength between the control group and the young table tennis players before and after the experiment ($P > 0.05$). However, the scores of eight abdominal bridges of the young athletes in the control group increased before and after the experiment, indicating that the core strength of the athletes in the control group was also enhanced after 12 weeks of routine physical training.⁸

Table 3 shows the analysis results of the differences in the scores of level 8 abdominal bridge of young table tennis players in the experimental group before and after the experiment.

It can be seen from Table 3 that the comparison results of Grade 8 abdominal bridge scores of young table tennis players in the experimental group before and after the experiment are as follows: There was significant difference in the core strength of young table tennis players in the

Table 1. Comparison of Grade 8 abdominal bridge scores between the experimental group and the control group before the experiment.

	Experience group (N=14)	Control group (N=13)	P value
Grade VIII abdominal bridge (points)	6.25±2.19	6.71±2.24	0.473

Table 2. Comparison of Grade 8 abdominal bridge scores of the control group before and after the experiment (N= 13).

	Experience group (N=14)	Control group (N=13)	P value
Grade VIII abdominal bridge (points)	6.87±1.97	7.12±21.83	0.207

Table 3. Comparison of Grade 8 abdominal bridge scores of the experimental group before and after the experiment (N= 14).

	Experience group(N=14)	Control group(N=13)	P value
Grade VIII abdominal bridge (points)	6.46±2.12	9.19±0.92	0.000**

experimental group before and after the experiment ($P < 0.01$). It can be seen from the average score of the eight level abdominal bridge of the athletes in the experimental group before and after the experiment that the average score of the eight level abdominal bridge of the athletes in the experimental group increased more after 12 weeks of core strength training, which shows that the core strength training method can significantly enhance the core strength of young table tennis players.⁹

After the experiment, the difference analysis results of Grade 8 abdominal bridge scores between the experimental group and the control group are shown in Figure 1.

It can be seen from the table tennis scores of the experimental group and the control group ($P < 0.01$).^{10,11} The scores of young table tennis

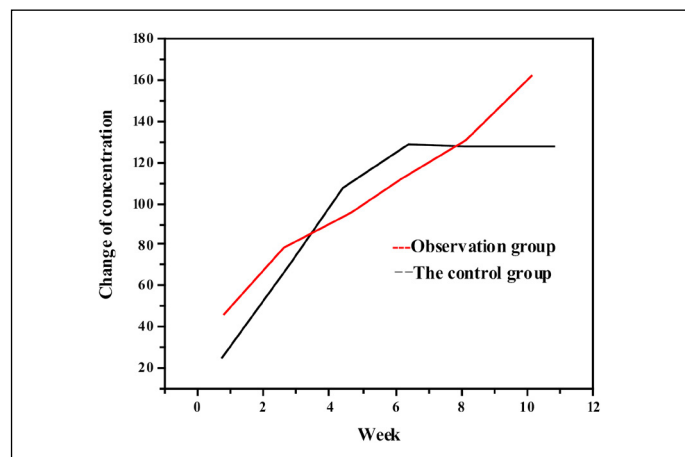


Figure 1. Comparison of Grade 8 abdominal bridge scores between the experimental group and the control group after the experiment.

players in the experimental group and the control group have improved, indicating that aerobic training and conventional physical training can promote the core strength of athletes. Among them, the effect of core strength training is better than conventional physical training, from the fourth level (6 points) of the eighth level abdominal Bridge maintenance posture table to close to the fifth level (10 points).

CONCLUSION

Generally speaking, we need to make various movements smoother through physical coordination in training, and accumulate experience in dealing with various situations in the cooperation of various parts of the body. In addition to training, efforts should be made to reduce the talent gap between athletes, make them develop a direct sense of dealing with the ball, strengthen their understanding of table tennis technology, reasonably use actions on the basis of physical response, adjust the way of hitting, and give full play to their creativity. The ways and methods in training play an important role, and the coach needs to give the development and improvement direction of athletes' ability according to their individual differences, and formulate targeted training strategies for them. In the process of helping them make up for their short board, give play to the advantages of outstanding events, so that athletes can adapt to different competition situations and gradually guide them to the rhythm suitable for athletes' personal characteristics. Thus, under the three-dimensional education, athletes can find their own positioning, explore their own training means, and maximize the training effect.

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