

INFLUENCE OF FUNCTIONAL TRAINING ON TEACHING TABLE TENNIS TO COLLEGE STUDENTS

INFLUÊNCIA DO TREINAMENTO FUNCIONAL NO ENSINO DE TÊNIS DE MESA EM ESTUDANTES UNIVERSITÁRIOS

INFLUENCIA DEL ENTRENAMIENTO FUNCIONAL EN LA ENSEÑANZA DE TENIS DE MESA EN ESTUDIANTES UNIVERSITARIOS



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ABSTRACT

Introduction: Contemporary table tennis teaching lacks attention to global abilities; some studies suggest that functional training can supply the demands of the high level of sport competition. **Objective:** Study the effect of functional training on teaching table tennis to college students. **Methods:** A controlled random selection was carried out (n=40), in which the experimental group (n=20) chose a functional training program. In contrast, the control group (n=20) participated in the teaching of traditional table tennis skills. The training frequency was one hour daily, three times a week, lasting six weeks. Table tennis-specific fitness was assessed before and after the experiment. Data were cataloged and statistically analyzed. **Results:** On the manual skills index, the experimental group's score increased from 63,194 to 79,683 points after the experiment, and the control group's score increased from 64,788 to 68,775 points after the experiment. In the regression index, the experimental group score increased from 63.645 to 78.614, and the control group score increased from 64.152 to 70.574. **Conclusion:** The functional training mode proposed in this paper can rapidly improve the competitive level of table tennis and improve the competitive performance of its practitioners. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Physical Education and Training; Racquet Sports; Educational Measurement.

RESUMO

Introdução: O ensino contemporâneo no tênis de mesa carece de atenção em habilidades globais, alguns estudos sugerem que o treinamento funcional possa suprir as demandas requisitadas pelo alto nível de competição esportiva. **Objetivo:** Estudar o efeito do treinamento funcional sobre o ensino do tênis de mesa nos estudantes universitários. **Métodos:** Foi realizada uma seleção randômica controlada (n=40), na qual o grupo experimental (n=20) escolheu um programa de treinamento funcional, enquanto o grupo de controle (n=20) participou do ensino das habilidades tradicionais do tênis de mesa. A frequência do treinamento foi de uma hora diária, três vezes por semana, com duração de seis semanas. A aptidão física específica do tênis de mesa foi avaliada antes e depois do experimento. Os dados foram catalogados e analisados estatisticamente. **Resultados:** No índice de habilidades manuais, a pontuação do grupo experimental aumentou de 63.194 para 79.683 pontos após o experimento, e a pontuação do grupo de controle aumentou de 64.788 para 68.775 pontos após o experimento. No índice de retrocesso, a pontuação do grupo experimental aumentou de 63.645 para 78.614, e a pontuação do grupo de controle aumentou de 64.152 para 70.574. **Conclusão:** O modo de treinamento funcional proposto neste artigo pode melhorar rapidamente o nível competitivo do tênis de mesa e melhorar o desempenho competitivo de seus praticantes. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Educação Física e Treinamento; Esportes com Raquete; Avaliação Educacional.

RESUMEN

Introducción: La enseñanza contemporánea en tenis de mesa carece de atención en habilidades globales, algunos estudios sugieren que el entrenamiento funcional puede suplir las demandas requeridas por el alto nivel de competición deportiva. **Objetivo:** Estudiar el efecto del entrenamiento funcional en la enseñanza del tenis de mesa en estudiantes universitarios. **Métodos:** Se realizó una selección aleatoria controlada (n=40), en la que el grupo experimental (n=20) eligió un programa de entrenamiento funcional, mientras que el grupo de control (n=20) participó en la enseñanza de las habilidades tradicionales del tenis de mesa. La frecuencia del entrenamiento fue de una hora diaria, tres veces por semana, con una duración de seis semanas. Se evaluó la forma física específica del tenis de mesa antes y después del experimento. Los datos se catalogaron y analizaron estadísticamente. **Resultados:** En el índice de habilidades manuales, la puntuación del grupo experimental aumentó de 63,194 a 79,683 puntos después del experimento, y la del grupo de control aumentó de 64,788 a 68,775 puntos después del experimento. En el índice de regresión, la puntuación del grupo experimental aumentó de 63,645 a 78,614, y la del grupo de control, de 64,152 a 70,574. **Conclusión:** El modo de entrenamiento



INTRODUCTION

With the continuous development of sports science, the concept of sports has been constantly improved.¹ The training concept of functional training has gradually come into people's view. Functional training was introduced into China by the General Administration of Sport of the People's Republic of China to improve the physical fitness of athletes.² With the continuous popularization of the theory of training knowledge, functional sequence has entered the physical education teaching in colleges and universities. And through long-term accumulation, functional training has a more mature training system.³ Table tennis has a very high influence in China. And the result of table tennis is also very impressive. The popularity of table tennis is due to its special interest. It can effectively improve the physical condition of college students, improve their physical quality and their indomitable will quality.⁴ Therefore, after colleges and universities set up table tennis courses one after another, countless college students took the initiative to join in the game of table tennis. On the basis of physical fitness, enjoy the fun of sports.⁵ In the teaching process, adding functional training teaching and training plan can improve students' sports level. I need to improve students' sports performance. It can bring high-quality sports experience to students, and through scientific training methods, students can have a deeper understanding of sports.⁶ The use of functional training methods has a very positive impact on the development of table tennis teaching in colleges and universities.

METHOD

Determination of research object

As shown in Table 1, there are 40 research subjects, which are freshmen of table tennis specialty in a university. The study and all the participants were reviewed and approved by Ethics Committee of Jiangsu Normal University (NO.JSNU2018TDZ09). They are divided into experimental group and control group through enrollment and lottery, with 20 students in each group. The height and weight of the subjects in the experimental group were (165.872 ± 6.6427) cm and (58.708 ± 5.8218) kg respectively, while the height and weight of the subjects in the control group were (169.187 ± 6.9186) cm and (58.258 ± 5.7821) kg respectively. The basic indicators of the subjects in the two groups were $P > 0.05$, indicating that there was no significant difference.

Conduct of training plan

This experiment has the following steps:

1. Understand your training needs. Based on his own sports and work experience, the author conducted research and visits with front-line physical education teachers and table tennis students to understand their shortcomings in the training and teaching process, and determined the final research direction and improvement goals.

Table 1. Basic information of the research object.

Index	Height (cm)	Weight (kg)
Experience group	165.872±6.6427	58.708±5.8218
Control group	169.187±6.9186	58.258±5.7821
t value	0.90226	1.63385
p value	0.37792	0.28805

2. Learning and understanding of literature. By using the method of literature research, the paper sorted out and analyzed the documents and books borrowed from the network and offline, studied the functional training and skills improvement related to table tennis training, and sorted out the basic program of functional analysis.

3. Pre test of the experimental scheme. Several volunteers were recruited for the pre experiment. This group of volunteers was not the same as the research subjects. Through the pre experiment, volunteers fed back their experience in training, and through consultation with experts, they adjusted the initial plan to obtain the final training plan.

4. Implementation of training plan. The method of controlled experiment was adopted, in which the experimental group chose functional training programs, including purposeful improvement of waist, abdomen, buttocks and thigh muscles, swing strength training, forehand and backhand hitting practice, etc., to combine strength training with table tennis skills. In the control group, the traditional aerobic exercise training and table tennis skill teaching were used to maintain the original training mode without any adjustment. In addition to different training programs, the training frequency and duration of the experimental group and the control group are three times a week and one hour each time, with a duration of six weeks, so as to ensure that the experimental results are not interfered by other factors.

5. Determination of observation indicators and statistics of data. Through the previous literature study and mutual interview, the indicators of 50 meter run, standing long jump, 1 minute sit up, 1 minute rope jump, 2.74 meter sliding platform, etc. were selected as the analysis results of college students' physical quality indicators. The analysis results of the table tennis skill indicators of college students include the air ball, wall ball, forehand flat serve, backhand push and block. Before and after the experiment, the relevant data of the experimental group and the control group were measured, and the data were statistically sorted and analyzed using excel software and SPSS software.

RESULTS

Effect of functional training on college students' physical quality

In this section, the physical quality of college students is analyzed by selecting indicators such as 50 meter run, standing long jump, 1 minute sit up, 1 minute rope skipping, 2.74 meter sliding platform, etc.

The physical fitness indexes of the experimental group and the control group before the training are shown in Table 2. From the data, it can be seen that there is no significant difference between the two groups of college students in terms of relevant indicators before the start of the experiment, $P > 0.05$ indicates that there is no significant difference. This also ruled out the interference of the two groups of athletes' different performance levels on the experimental results, making the experiment more convincing.

The relevant indicators of physical fitness of the experimental group and the control group after six weeks of training are shown in Table 3. Through the comparison between Table 2 and Table 3, it can be seen that in the 50 meter running indicators, the time of the experimental group is shortened from 8.713 ± 0.6858 (s) to 8.160 ± 0.5389 (s) after the

experiment, and the time of the control group is shortened from 8.877 ± 0.4153 (s) to 8.551 ± 0.4457 (s) after the experiment. In the standing long jump index, the distance in the experimental group increased from 170.752 ± 9.8280 (cm) to 179.484 ± 12.4231 (cm) after the experiment, and the distance in the control group increased from 173.609 ± 11.8798 (cm) to 176.320 ± 11.6762 (cm) after the experiment. In the 1-minute sit up index, the number of sit ups in the experimental group increased from 33.311 ± 3.3226 to 36.251 ± 1.2460 after the experiment, and the number of sit ups in the control group increased from 34.886 ± 3.1872 to 36.880 ± 1.0953 after the experiment. In the 1-minute rope skipping index, the number of times in the experimental group increased from 92.754 ± 2.2497 (pcs) to 95.714 ± 2.3210 (pcs) after the experiment, and the number of times in the control group increased from 96.233 ± 1.2889 (pcs) to 99.272 ± 2.2915 (pcs) after the experiment. In the 2.74m sliding platform index, the number of times in the experimental group increased from 12.063 ± 2.0433 (times) to 16.389 ± 1.8739 (times) after the experiment, and the number of times in the control group increased from 12.117 ± 1.2933 (times) to 13.962 ± 1.6852 (times) after the experiment. This shows that the functional training method proposed in this paper has a better effect than the traditional table tennis skill teaching and aerobic training in terms of speed improvement, jump distance improvement, and core strength and stability optimization, which can improve the efficiency of table tennis training for college students in a short time and enhance basic skills.

Effect of functional training on college students' table tennis skills

In order to improve the competitive level of the students majoring in table tennis, enable them to gain more initiative in the sports field, and improve the training results of table tennis, in addition to having solid

basic skills, we should also strengthen the practice of table tennis skills. Therefore, in this section, the indexes of air ball, wall ball, forehand flat serve, backhand push and block are selected to analyze the impact of functional training and traditional table tennis skill teaching on college students' table tennis skill indexes.

Table 4 shows the table tennis skill statistics of the experimental group and the control group before the start of training. There is no significant difference between the two groups. If the P value is greater than 0.05, there is no significant difference. The interference of the original level of athletes to the experimental results was eliminated.

After six weeks of training, the relevant indicators of table tennis skills of the experimental group and the control group are shown in Table 5. Through the comparative analysis of Table 4 and Table 5, it can be seen that the number of experimental group indicators has increased from 63.280 ± 17.3807 (points) to 109.134 ± 21.1527 (points) after the experiment, and the number of control group indicators has increased from 65.018 ± 17.0078 (points) to 79.198 ± 14.8198 (points) after the experiment. In the index of wall bumping, the number of the experimental group increased from 31.567 ± 10.1635 (minutes) to 52.857 ± 14.9591 (minutes) after the experiment, and the number of the control group increased from 34.034 ± 10.9330 (minutes) to 42.934 ± 9.8845 (minutes) after the experiment. In the forehand flat serve index, the score of the experimental group increased from 63.194 ± 5.9968 (points) to 79.683 ± 3.9709 (points) after the experiment, and the score of the control group increased from 64.788 ± 4.6673 (points) to 68.775 ± 4.7364 (points) after the experiment. In the backhand pushing index, the score of the experimental group increased from 63.645 ± 6.1689 (points) to 78.614 ± 4.2042 (points) after the experiment, and the score of the control group increased from 64.152 ± 4.1021 (points) to 70.574 ± 3.7748 (points) after the experiment.

Table 2. Statistical analysis of physical fitness indexes of college students before the experiment.

Index	50 meter run (s)	Standing long jump (cm)	1 minute sit-ups (1)	1 minute rope skipping (piece)	2.74m sliding platform (times)
Experience group	8.713±0.6858	170.752±9.8280	33.311±3.3226	92.754±2.2497	12.063±2.0433
Control group	8.877±0.4153	173.609±11.8798	34.886±3.1872	96.233±1.2889	12.117±1.2933
t value	0.64243	0.47336	0.10074	0.80039	-1.12377
P value	0.52791	0.63194	0.13946	0.11940	0.76052

Table 3. Statistical analysis of physical fitness indexes of college students after the experiment.

Index	50 meter run (s)	Standing long jump (cm)	1 minute sit-ups (1)	1 minute rope skipping (piece)	2.74m sliding platform (times)
Experience group	8.160±0.5389	179.484±12.4231	36.251±1.2460	95.714±2.3210	16.389±1.8739
Control group	8.551±0.4457	176.320±11.6762	36.880±1.0953	99.272±2.2915	13.962±1.6852
t value	-0.90942	2.06954	0.90976	0.56117	3.33995
P value	0.37496	0.04801	0.10587	0.05032	0.00199

Table 4. Statistical Analysis of Table Tennis Skill Indexes of College Students before the Experiment.

Index	Bounce the ball in the air (one)	Bounce the ball against the wall (one)	Forehand flat serve (points)	Backhand push (points)
Experience group	63.280±17.3807	31.567±10.1635	63.194±5.9968	63.645±6.1689
Control group	65.018±17.0078	34.034±10.9330	64.788±4.6673	64.152±4.1021
t value	-0.06138	0.59959	0.37110	-0.87614
P value	0.89202	0.54670	0.73192	0.37891

Table 5. Statistical Analysis of Table Tennis Skill Indexes of College Students after the Experiment.

Index	Bounce the ball in the air (one)	Bounce the ball against the wall (one)	Forehand flat serve (points)	Backhand push (points)
Experience group	109.134±21.1527	52.857±14.9591	79.683±3.9709	78.614±4.2042
Control group	79.198±14.8198	42.934±9.8845	68.775±4.7364	70.574±3.7748
t value	7.04625	3.42548	11.19053	9.83688
P value	0.03947	0.03429	0.00000	0.00000

DISCUSSION

Functional training principle

Table tennis is an antagonistic sport in which technology plays a leading role. Anaerobic exercise has become the main form of exercise during exercise. With the progress of sports science, people's living standards have improved. After the intake of rich nutrients, students can improve their own level more effectively through training. Because competitive sports put forward certain requirements for the physical quality of students, in the high-intensity sports environment, excellent sports ability benefits from daily scientific training. In particular, the physical fitness attribute, as the basic sports attribute in all competitive sports, has a great impact on the competition. Under the traditional teaching mode, physical training and technical training. It depends on the basic courses for students. However, with the continuous development of sports concept, sports events require faster and stronger. This traditional model is no longer applicable to today's development philosophy. Therefore, the introduction of functional training to improve their technical ability and physical level has been widely accepted by the sports industry.

Table tennis functional training methods

It is the core of the teaching significance of functional training in colleges and universities to formulate effective functional training plans in combination with the sports methods and competition rules of table tennis. Through the daily college, students can constantly improve their technical actions. Improve your physical quality. Through daily training behavior, students can intuitively understand the significance of reasonable distribution of self body. The specific training methods in the training process vary from person to person. The core of functional training is to focus on its own weak links. In the process of functional training, strength training is not only to improve their muscle volume and muscle volume. The main purpose is to improve students' muscle control ability and overall coordination ability. In the training, the students' technical level

of the project is improved by means of simulated competition to achieve the purpose of improving sports performance. As functional training emphasizes the improvement of core strength, in the daily training process, the waist and abdomen, hip muscles and thigh muscles can be improved respectively by means of weight bearing squatting, hip bridge, and weight bearing end abdomen. The improvement of core strength will help students maintain high-quality exercise duration in the process of sports. For the improvement of technical action, we can carry out targeted swing strength exercises for table tennis under the professional guidance of teachers. After strength training, you can practice forehand and backhand hitting with certain training intensity. Through the continuous improvement of their own quality and technical ability, students' ability to combine attack and defense can be effectively improved. After the training reaches a certain length, students can intuitively feel the improvement of their technical level. In addition, some feedback can be given to daily training on sports performance.

CONCLUSION

The research results show that the functional training method proposed in this paper, compared with the traditional table tennis skill teaching, has a better effect on the improvement of basic skills, thus providing a more solid foundation for table tennis players, improving some basic movement levels in the process of table tennis competition, so that players can better play their own table tennis skills in the process of fighting, and rapidly improve the competitive level of table tennis, Master the initiative in the competition and improve the competitive performance.

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