

ANALYZING THE EFFECTS OF STRENGTH-TRAINING-BASED ARTISTIC GYMASIC TEACHING



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ANÁLISE DO EFEITO DO ENSINO DE GINÁSTICA ARTÍSTICA BASEADA NO TREINO DE FORÇA

ANÁLISIS DEL EFECTO DE LA ENSEÑANZA DE LA GIMNASIA ARTÍSTICA BASADO EN EL ENTRENAMIENTO DE FUERZA

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ABSTRACT

Introduction: Artistic gymnastics is a traditional Chinese sport that enhances physical fitness, generates entertainment, and has a great visual impact. Its main objective is to develop human physical potential and improve motor coordination and body balance. The integration of strength training increases the athlete's ability and can also contribute to teaching artistic gymnastics. **Objective:** Study the effect of strength training on teaching artistic gymnastics based on strength training. **Methods:** 40 male students who specialized in artistic gymnastics were selected as experimental subjects and divided into a control group and an experimental group (20 in each group). Both groups received training for 16 weeks, with the experimental group receiving two additional hours of resistance strength training daily. **Results:** After the experiment, there were significant differences in parallel bar skills between the experimental group and the control group, and significant differences in horizontal bar mastery, but there were no significant differences in jumping technology. **Conclusion:** The research shows that strength training can effectively assist in teaching artistic gymnastics, allowing greater performance in learning complex movements. **Level of Evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Resistance Training; Gymnastics; Teaching.

RESUMO

Introdução: A ginástica artística é um esporte tradicional chinês que valoriza a aptidão física, gera entretenimento e possui grande impacto visual. Seu principal objetivo é desenvolver o potencial humano físico e melhorar a capacidade de coordenação motora e equilíbrio corporal. A integração de treinos de força incrementa a habilidade do esportista e pode contribuir também no ensino da ginástica artística. **Objetivo:** Estudar o efeito do treinamento de força no ensino de ginástica artística baseado no treinamento de força. **Métodos:** 40 estudantes do sexo masculino especializados em ginástica artística foram selecionados como objetos experimentais e divididos em grupo controle e grupo experimental (20 em cada grupo). Ambos grupos receberam treinamento por 16 semanas, sendo que o grupo experimental recebeu 2 horas adicionais de treinamento de força resistida diariamente. **Resultados:** Após o experimento, houve diferenças significativas nas habilidades em barras paralelas entre o grupo experimental e o grupo controle, diferenças significativas no domínio de barras horizontais, mas não houve diferenças significativas na tecnologia de saltos. **Conclusão:** A pesquisa mostra que o treinamento de força pode efetivamente auxiliar no ensino de ginástica artística, permitindo maior desempenho no aprendizado de movimentos complexos. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Treinamento de força; Ginástica; Ensino.

RESUMEN

Introducción: La gimnasia artística es un deporte tradicional chino que valora la forma física, genera entretenimiento y tiene un gran impacto visual. Su principal objetivo es desarrollar el potencial físico humano y mejorar la capacidad de coordinación motriz y el equilibrio corporal. La integración del entrenamiento de fuerza aumenta la capacidad del deportista y puede contribuir también a la enseñanza de la gimnasia artística. **Objetivo:** Estudiar el efecto del entrenamiento de fuerza en la enseñanza de la gimnasia artística basado en el entrenamiento de fuerza. **Métodos:** Se seleccionaron 40 estudiantes varones especializados en gimnasia artística como sujetos experimentales y se dividieron en un grupo de control y un grupo experimental (20 en cada grupo). Ambos grupos recibieron entrenamiento durante 16 semanas, y el grupo experimental recibió 2 horas adicionales de entrenamiento de fuerza resistida cada día. **Resultados:** Después del experimento, hubo diferencias significativas en las habilidades de barra paralela entre el grupo experimental y el grupo de control, diferencias significativas en el dominio de la barra horizontal, pero no hubo diferencias significativas en la tecnología de salto. **Conclusión:** La investigación demuestra que el entrenamiento de fuerza puede ayudar eficazmente en la enseñanza de la gimnasia artística, permitiendo un mayor rendimiento en el aprendizaje de movimientos complejos. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Entrenamiento de fuerza; Gimnasia; Enseñanza.



INTRODUCTION

Gymnastics is a sport based on bare hands, hand-held instruments and fixed instruments to carry out single technical actions, technical action combinations and complete sets of technical actions at different levels and difficulty types. Its main goal is to develop human potential and improve the coordination and control ability of the body.¹ In the development of gymnastics history, it was closely related to the politics, economy, culture, society and art of the country at that time.² Gymnastics is a traditional sports and cultural heritage of the Chinese nation, which needs to be protected and promoted. Gymnastics teaching is an important part of Chinese school physical education. It has a positive impact on students' physical and mental development. It can improve students' physical condition, enhance physical function, improve athletes' ability and strength.³ Because the project has high requirements for physical coordination, the positive transfer of sports skills can be well carried out after learning gymnastics. Therefore, all physical education teaching work is to enable students to successfully complete the teaching objectives and improve their self-worth. This is also the primary research and consideration of educators.⁴ In recent years, the research on core strength has gradually entered people's eyes and become a hot topic. The core strength is summarized from the concept of core stability, which is homologous with spinal stability, and the concept of spinal stability is its primary concept. It is mainly composed of active spinal muscles, neural control units and passive spinal points. This paper holds that the concrete embodiment of core strength is core stability, and introduces it into the field of sports.⁵ This topic uses the theoretical knowledge related to core strength training, combined with practical research and comparative analysis, and suggests that athletes use core strength training in gymnastics training in order to improve the effect of gymnastics teaching and training.

METHOD

This experiment adopts the method of random sampling. 40 male students majoring in Gymnastics in a sports college in 2020 are selected as the experimental objects. The study and all the participants were reviewed and approved by Ethics Committee of Inner Mongolia Minzu University (NO.19IMUZS003). After confirming that they are in good physical condition and have no medical history and other diseases, they are randomly divided into experimental group and control group (20 people in each group). Before the experiment, the students' age, height, weight and contact years were tested by independent t-test, and the results were analyzed by SPSS 20.0 data analysis software. There was no significant difference in age, height, weight and contact years between the experimental group and the control group ($P > 0.05$).

Test and evaluation indicators: the core strength test and evaluation indicators adopt the eight level abdominal bridge test and one minute sit ups test; Special skill test indicators include single pedal ground turning into support, riding support front loop, riding support rotating 180° into support, supporting abdominal loop, split leg sitting, slow shoulder handstand, split leg sitting front roll into split leg sitting, support swing, bar end jump, split leg riding forward, cartwheel turning 90° (spring), fish jump forward roll, cartwheel turn, shoulder elbow handstand, cross horse split leg jump, longitudinal box front roll, etc.

Using SPSS scientific statistics software of Windows version 20.0, the collected data are statistically processed, frequency distribution and descriptive statistics, and the relevant factors are analyzed.

RESULTS

Effect analysis of elastic band training method in gymnastics strength quality training

In this study, the elastic band training method is used to assist in the training of gymnastics strength quality. In order to obtain the training

effect of this method, a questionnaire survey is conducted on the students after the experiment, and the appropriate influence feedback is obtained through the students' own feelings and experience. At the same time, professional gymnastics teachers are invited to score the students' training results and scientifically evaluate the elastic band training method designed in this study.

When investigating the influence of elastic band training methods on students' strength quality, it is evaluated from two aspects: on the one hand, whether students feel the role of muscle strength in elastic band training and whether they feel muscle soreness. It can be seen from the data in Figure 1 that 41% of the students have an obvious sense of strength during elastic belt training, 57% of the students have an obvious sense of strength, and 4% of the students feel relatively general. In terms of whether they feel muscle pain after elastic band training, 53% of the students feel particularly obvious, 39% feel more obvious and 8% feel average.

After using the elastic band training method, this paper makes a cross analysis on the influence of improving movement control, movement range and body posture on basic gymnastics. As shown in Figure 2, 59% of the students believe that the use of elastic band training method is conducive to improving the basic movement control effect of gymnastics, and it is the most significant; 10% of the students thought that the elastic belt training method had the most significant effect on increasing the range of basic gymnastics activities, while 31% of the students thought that the elastic belt training method had the most significant effect on changing the body posture.

After the experiment, the test indexes and test results of the experimental group and the control group were compared and analyzed

After the experiment, the indexes related to the core strength of the experimental group and the control group were tested. The test data obtained after independent t-sample test between groups are shown in Table 1.

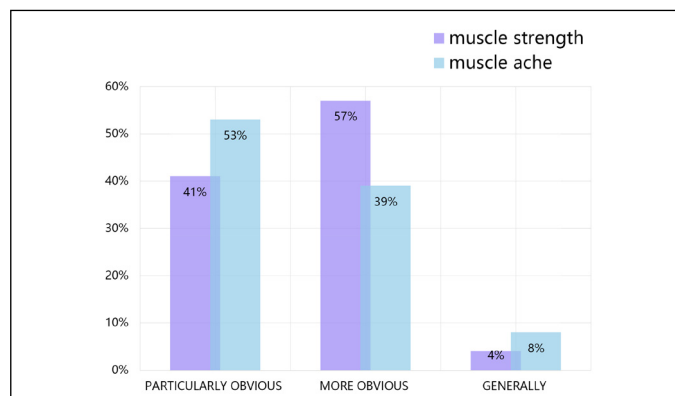


Figure 1. Students' evaluation of muscle feeling after training with elastic band method.

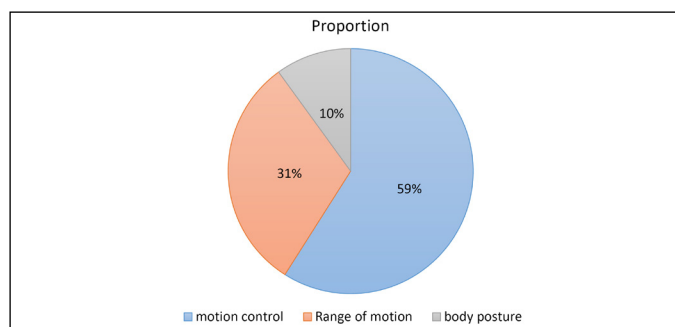


Figure 2. Comparative evaluation on the effect of students' elastic band training on improving the basic movement level of Gymnastics.

Table 1. Comparison of core strength index test results between the experimental group and the control group after the experiment (n = 40).

Core power indicator	Experience group	Control group	T	P
Eight-level bridging	31.26±16.09	16.26±10.32	3.544	0.001
One minute, two heads	42.42±4.63	38.78±5.41	2.309	0.028

After the two groups of students were trained in different ways, after the eight level abdominal bridge test and one minute double head supine up test, we found that the experimental group was better than the control group in terms of the experimental test results, and there were significant differences in the test results, indicating that after 16 weeks of core strength training, the students in the experimental group performed better than the students in the control group, mainly in terms of core strength and trunk stability, The specific reasons are as follows: firstly, in the training plan of the experimental group, we used auxiliary devices such as Swiss ball and sling to enable the students to fully mobilize the core muscle group while overcoming the unstable state. While training the core large muscle group, we also need to better control the deep core small muscle group and keep the trunk in a reasonable position; Secondly, in the training plan of the control group, we only select the traditional waist and abdomen strength training. The methods and techniques used in this training method are more suitable for exercising the large muscle groups in the core area, while there are fewer opportunities for exercising the small core muscle groups in the deep layer. Therefore, it is relatively weak in controlling the posture of the body and maintaining the strength of the trunk. After 16 weeks of core strength training, compared with the control group, the students in the experimental group have improved in the core strength test and one minute supine and two head up, but the training effect of the experimental group is better.

After the experiment, the special techniques of the experimental group and the control group were tested. The test data obtained after passing the inter group independent t-test are shown in Table 2.

As can be seen from Table 2, after the 16 week experiment, the improvement of the experimental group is more obvious than that of the control group in the comparison of the test results of various special skills between the experimental group and the control group.

After the experiment, a comparative analysis of the scores of gymnastics technical combination between the experimental group and the control group

After 16 weeks of gymnastics teaching and training, the students in the experimental group and the control group were assessed for gymnastics skills within one week after the end of the course.

It can be seen from Figure 3 that after 16 weeks of gymnastics training, the skill score of the experimental group is 0.46 points higher than that of the control group, the score of the horizontal bar is 0.50 points higher than that of the control group, the score of the parallel bar is 0.41 points higher than that of the control group, and the score of the jumping goat is 0.22 points higher than that of the control group. From the comparison of the average scores of the two groups after the experiment, it can be seen that the indexes of the experimental group are better than those of the control group. It can be seen that after 16 weeks of gymnastics teaching and training, the gymnastics technical performance of the experimental group is better than that of the control group.

DISCUSSION

Core strength training is aimed at the core muscle group and its small deep muscle group, including stability, strength, balance and other abilities. By definition, the core strength training elements are mainly the muscle groups in the core area and the deep small muscle

Table 2. Comparison of special skill test results between the experimental group and the control group after the experiment (n = 40).

Project	Special technical indicator	Experience group	Control group	T	P
Bumper	Single feet fluttering into support	7.23±0.91	6.46±1.41	2.118	0.0495
	Riding ahead	6.86±0.98	6.24±0.94	2.239	0.0485
	Riding 180 ° support	6.72±0.62	6.27±0.69	2.105	0.0384
	Support abdominal ring	6.80±0.85	6.26±0.74	2.088	0.0394
Parallel bars	Slow down the legs	6.79±0.77	6.26±0.76	2.227	0.0232
	Sitting on the legs sitting in the legs	6.86±0.72	6.36±0.70	2.145	0.0293
	Support swing	7.10±0.77	6.63±0.81	1.898	0.0677
Skill	Bumper jumping up leg riding	6.87±0.62	6.22±0.76	2.149	0.0091
	Turn over 90 ° (Scorpion)	6.67±0.62	6.26±0.60	2.087	0.0424
	Turpouse before the fish	6.89±0.66	6.22±0.79	2.071	0.0071
	Side hand down	7.29±0.68	6.72±0.80	2.105	0.0202
Jump	Shoulder elbow	7.11±0.60	6.59±0.66	2.147	0.0121
	Horizontal horses	6.91±0.75	6.40±0.84	1.963	0.0545
	Longulate box roll over	7.16±0.98	6.50±0.92	2.072	0.0343

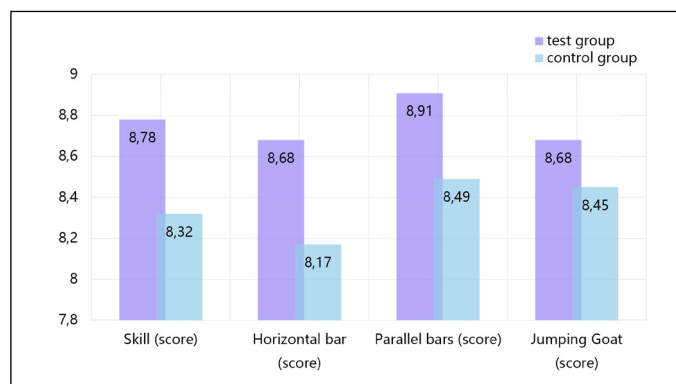


Figure 3. Comparison chart of the mean value of gymnastics skill examination results between the experimental group and the control group after the experiment.

groups, rather than the large muscle groups in the traditional waist and abdomen strength training. The difference between the core strength training and the traditional waist and abdomen strength training is that the core strength training can recruit and activate as many relevant muscle groups as possible, focusing not only on increasing the strength of the large muscle groups, but also on improving the strength of the deep small muscle groups. Focus on the stability and cooperation between large and small muscle groups, as well as the precise control of muscles by the nervous system. Gymnastics belongs to performance events, the movements are quite complex, and the requirements for all aspects of the human body are quite strict. If the movement is complete, it requires the cooperation and cooperation of different systems, accurate perception among muscle groups, and relatively many muscle groups are involved. Therefore, the rapid recruitment and mobilization of related muscle groups is one of the important factors affecting the quality of gymnastics. The training of core strength mostly adopts non rigid support surface training platform, which can well simulate the environmental conditions required in the process of completing gymnastics. The human body will constantly adjust muscle condition and body posture to realize the dynamic cycle process of "balance imbalance balance", which can stimulate the speed and area of recruitment and mobilization of relevant muscle groups, especially the use of deep small muscle groups and small auxiliary muscle groups around joints ignored in traditional strength training.

In gymnastics training, it is not enough to do only basic single exercises, but also combined with instrument exercises. Students can exercise according to different types of fitness equipment. For example, lifting rings, horizontal bars, parallel bars support swing, etc.⁶ The above exercises can help athletes exercise core muscles and maintain a good posture. In addition, you can also use comprehensive training equipment to practice, which can effectively improve the difficulty of training. Gymnasts can master their body movements well after the first unarmed or armed training to ensure that their body movements are always in the correct position during the exercise.

Gymnastics coaches need to turn to the training mode with coaches as the main body when they carry out core strength training. Coaches can stimulate students' hidden subjective initiative and creativity through other ways. At the same time, they can also reserve enough development space for students and guide students to give full play to their potential. During core strength training, students may try to change and find a set of core strength training techniques suitable for them to improve their gymnastics performance.

CONCLUSION

In recent years, core strength training has gradually become a hot word in the sports industry. Whether in the process of school physical education or in various fields of sports industry, core strength training is highly valued by coaches and athletes. At present, there are many core strength training methods, but in the process of gymnastics training, the essence of core strength training methods is relatively single. The combination of core strength training technology and special gymnastics training technology into practice is bound to make the gymnastics training content more comprehensive and diversified, and has many advantages for the body control and balance ability of gymnasts, which can effectively improve the teaching effect. On the basis of strength training, this paper selects 30 gymnasts for experimental test, and finally finds that the gymnasts who have received strength training can complete gymnastics exercises better. Compared with the control group, strength training can improve the effect of gymnastics teaching.

The author declare no potential conflict of interest related to this article

AUTHORS' CONTRIBUTIONS: The author has completed the writing of the article or the critical review of its knowledge content. This paper can be used as the final draft of the manuscript. Every author has made an important contribution to this manuscript. ZS: writing and execution.

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