

IMPROVEMENTS IN THE PHYSICAL COORDINATION SKILLS OF GYMNASTS

APRIMORAMENTOS NA CAPACIDADE DE COORDENAÇÃO FÍSICA DOS GINASTAS

MEJORAS EN LAS HABILIDADES DE COORDINACIÓN FÍSICA DE LOS GIMNASTAS



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ABSTRACT

Introduction: In the specific sports of gymnastics, athletes' physical quality and professional ability are actively improved, and a special training plan is also actively designed. **Objective:** Improve the physical coordination ability of gymnastic athletes. **Methods:** 50 professional gymnasts were selected, 25 in the experimental group and 25 in the control group. The intervention took 2 hours of daily training in gymnastics class; the period was in a non-competitive season cycle. **Results:** After the experiment, the average performance of the athletes in the experimental group was higher than those before the experiment in the four indicators of push-ups, extensions, supine, and high leg kicks; however, in the three indicators of push-ups, pull-ups, and high leg kicks, the standard deviation after the experiment presented higher than that before (the results after the experiment were not shown to be as stable as those before the experiment). **Conclusion:** During exercise, especially in complex movements, abdominal core strength balances the distribution of physical force for athletes, reducing overall energy expenditure. Thus, athletes can coordinate lower limbs to move with greater speed and precision. **Level of Evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Resistance Training; Sports; Gymnastics.

RESUMO

Introdução: Nos esportes específicos da ginástica, a qualidade física e a capacidade profissional dos atletas são ativamente aperfeiçoadas, e o plano especial de treino é também ativamente delineado. **Objetivo:** Aprimorar a capacidade de coordenação física nos atletas ginastas. **Métodos:** Foram selecionados 50 ginastas profissionais, 25 no grupo experimental e 25 no grupo de controle. A intervenção deu-se por 2 horas de treinamento diário na aula de ginástica, o período foi em um ciclo de temporada não competitiva. **Resultados:** Após o experimento, o desempenho médio dos atletas no grupo experimental foi maior do que aqueles antes do experimento, nos quatro indicadores de flexões, extensões, supino, chutes de perna alta, porém, nos três indicadores de flexões, flexões e chutes de perna alta, o desvio padrão após o experimento apresentou-se maior do que aquele anterior (os resultados após o experimento não se demonstraram tão estáveis quanto aqueles antes do experimento). **Conclusão:** Durante os exercícios, especialmente em movimentos complexos, a força do core abdominal equilibra a distribuição da força física para os atletas, reduzindo o consumo energético geral. Assim, os atletas podem coordenar membros inferiores para moverem-se com maior rapidez e precisão. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Treinamento de força; Esportes; Ginástica.

RESUMEN

Introducción: En los deportes específicos de la gimnasia, la calidad física y la capacidad profesional de los atletas se mejoran activamente, y el plan de entrenamiento especial también se perfila activamente. **Objetivo:** Mejorar la capacidad de coordinación física en los atletas de gimnasia. **Métodos:** Se seleccionaron 50 gimnastas profesionales, 25 en el grupo experimental y 25 en el grupo de control. La intervención se llevó a cabo mediante 2 horas diarias de entrenamiento en clase de gimnasia, el período fue en un ciclo de temporada no competitivo. **Resultados:** Después del experimento, el rendimiento medio de los atletas del grupo experimental fue superior al de antes del experimento, en los cuatro indicadores de flexiones, extensiones, supinación y patadas altas, sin embargo, en los tres indicadores de flexiones, extensiones y patadas altas, la desviación estándar después del experimento se presentó más alta que antes (los resultados después del experimento no se mostraron tan estables como los de antes del experimento). **Conclusión:** Durante los ejercicios, especialmente en los movimientos complejos, la fuerza del core abdominal equilibra la distribución de la fuerza física de los atletas, reduciendo el gasto energético total. Así, los atletas pueden coordinar los miembros inferiores para moverse con mayor velocidad y precisión. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Entrenamiento de Fuerza; Deportes; Gimnasia.



INTRODUCTION

In the special sports of gymnastics, the physical quality and professional ability of the athletes are actively improved, and the special training plan is actively defined, which promotes the further improvement of the students' special quality. Strengthen the analysis of gymnastics training techniques, encourage athletes to combine traditional training with core strength training in a timely manner, it better reflects the timeliness of gymnastics.¹ Through years of gymnastics teaching experiments, we know that, special training is the main way to improve the professional ability of gymnasts, in the new era, it is necessary to actively innovate the gymnastics teaching mode, and actively carry out effective attempts to improve the sports quality of athletes. Strengthen special training, actively create a harmonious and good training environment for athletes, improve athletes' strength and physical literacy, and focus on cultivating athletes' flexibility and coordination, on this basis, the effect of special gymnastics training has been effectively enhanced. Provide timely and correct guidance to athletes, promote the effective improvement of athletes' physical quality, it fully reflects the competitive nature of gymnastics special training, which has played an important role in the development of Chinese gymnastics.²

METHOD

Experimental subjects

The author's experiment is based on the competitive gymnasts from the first grade to the third grade, 50 competitive gymnasts were selected.³

Experimental method

The evaluation indicators are determined mainly through literature review, actual research, expert screening combined with theoretical analysis. First, a comprehensive survey of the strength and quality monitoring indicators and standards of 19-20-year-old male gymnasts in grass-roots sports schools in various schools, combined with the monitoring materials of strength quality training during the Olympic period, the strength quality evaluation index of 19-20-year-old male gymnasts was determined. 25 people in the experimental group, 25 people in the control group, 2 hours of training every day in the gymnastics training class, the time is a mid-cycle of the non-competitive season, the training mid-cycle consists of at least two small cycles, the traditional cycle theory believes that the total duration of the commonly used mid-cycle is about one month, that is, it consists of three to six small cycles. The experiment takes ten days as a small cycle, and there are two small cycles in total. The experimental group underwent core strength training in competitive gymnastics, while the control group underwent traditional abdominal and abdominal strength training in competitive gymnastics.⁴ Before the experiment, students in each group were tested for their basic physical fitness. During the experiment, the groups were asked not to participate in any other special training.

Mathematical Statistics

According to "Practical Statistical Methods and SPSS Operation", the collected data were processed by the statistical program SPSS. The data of each group were expressed as mean \pm standard deviation ($X \pm S$), and the significant difference was compared by t test.⁵

There is no need for a code of ethics for this type of study.

RESULTS

As can be seen from Figure 1, the athletes in the experimental group were slightly higher than those in the control group in terms of the average number of four physical fitness indicators: supine two-headed ups, push-ups, prone two-headed ups and high-leg kicks, the standard

deviation of the experimental group, it is also smaller than the control group (the experimental group's performance stability is higher than that of the control group), assuming that there is no significant difference in physical fitness between the experimental group and the control group, after statistical analysis, the probability of lying on the back, push-ups, two-legs and high kicks in the experimental group and the control group was $P > 0.05$, the difference is not significant, confirming the null hypothesis.⁶ Therefore, the above physical qualities of the experimental group and the control group belong to the same level before the experiment.

As can be seen from Figure 2, after the experiment, the average number of athletes in the experimental group was higher than that before the experiment in the three indicators of lying on the back, push-ups and standing on the prone, the standard deviation after the experiment is smaller than that before the experiment (the performance stability after the experiment is higher than that before the experiment). Assume that the subjects in the experimental group before and after a small period of training, there is a significant difference in physical fitness, after statistical analysis, before and after the experiment, the probability $P > 0.05$ of the subjects in the experimental group on the supine two-headed up, push-up, prone two-headed up and high-leg kicks, the difference is not significant, rejecting the null hypothesis. Therefore, the subjects in the experimental group before and after a small period of training, there was no significant difference in physical fitness.⁷

As can be seen from Figure 3, after the experiment of the athletes in the control group, the average number of the two indicators of lying on the back and doing push-ups was higher than that before the

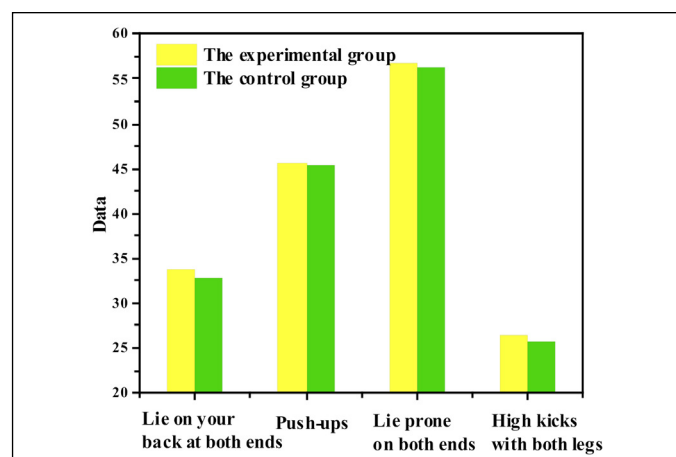


Figure 1. Statistics of the average and standard deviation of the physical fitness indicators of the athletes in the experimental group and the control group before the experiment.

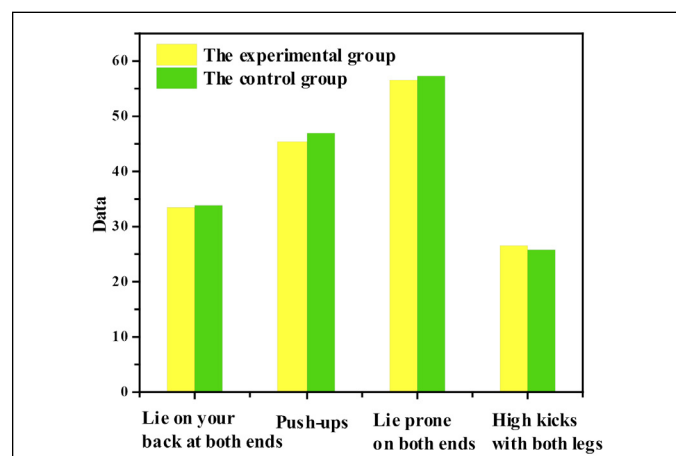


Figure 2. The statistical table of the average and standard deviation of each index of the test content before and after the experiment for athletes in the experimental group.

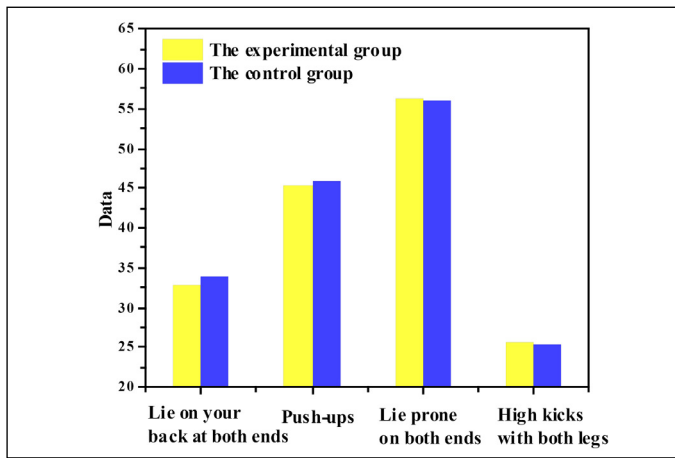


Figure 3. Statistics of the average and standard deviation of each index of the test content of the athletes in the control group before and after the experiment.

experiment, in the three indicators of lying on the back, push-ups and high kicks, the standard deviation after the experiment is smaller than that before the experiment (the performance stability after the experiment is higher than that before the experiment). Assuming that there is a significant difference in the physical fitness of the subjects in the control group before and after a small period of training, after statistical analysis, before and after the experiment of the subjects in the control group, the probability $P > 0.05$ on the supine two-headed up, push-up, prone two-headed up and high-leg kicks, $P > 0.05$, the difference is not significant, rejecting the null hypothesis. Therefore, the subjects in the control group before and after a small period of training, there was no significant difference in physical fitness.⁸

As can be seen from Figure 4, after the experiment, athletes in the experimental group had higher averages than before the experiment in the four indicators of supine two-headed ups, push-ups, prone two-headed ups and high-leg kicks, however, in the three indicators of push-ups, push-ups, and high-leg kicks, the standard deviation after the experiment is greater than that before the experiment (the results after the experiment are not as stable as those before the experiment). Suppose the subjects in the experimental group before and after two small periods of training, there is a significant difference in physical fitness, after statistical analysis, however, before and after the experiment of the subjects in the experimental group, the probability of lying on the back, push-ups, lying on the head and high kicks was $P < 0.05$, the difference is significant, confirming the null hypothesis. Therefore, after two small cycles of core strength training in the experimental group, the above four physical qualities were significantly enhanced.⁹

DISCUSSION

Coordination to overcome muscle tension and relaxation. Aerobics does not require the sturdy body and extra muscle strength of physical athletes, what it needs is speed, strength and rhythm. Therefore, relaxing the muscles that are counteracting the prime mover allows the movement to move faster. In addition, any movement of the athlete will make the active muscles and passive muscles confront each other when the athlete is in a state of tension, thus causing the practitioner to consume too much energy. The coordination ability of technical movements to be fully and fully exerted. The technical movements of aerobics are completed by basic steps and different forms of arm movements, and the changes of movements are caused by the contraction of muscles and the displacement of bones (including joints). Every technical movement needs to be coordinated by the basic steps of the feet and the movements of the upper limbs, and every movement process as well

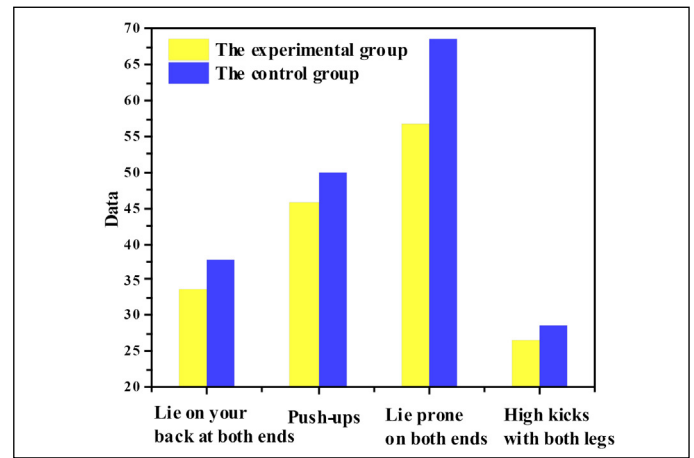


Figure 4. Statistics of the average and standard deviation of each index of the test content of the athletes in the experimental group before and after the experiment.

as the head, torso and other parts must be reasonably coordinated, only in this way can the movement be fast and explosive, and only in this way can the balance be controlled. Give full play to the coordination ability of combined technology. For an athlete to score points in difficult movements, he must possess the qualities of flexibility, flexibility, coordination, balance, and speed. But often some novice aerobics can only get used to doing B-level movements in training or competitions, and it is difficult to make B-C-A-level movements. This is the lack of the ability to perform difficult movements when the movement skills and the body are in different positions, a kind of incoordination in the technique.

After a period of conscious practice, I believe that coordination can be greatly improved and improved, especially for athletes with poor coordination. Coaches can train for 3 months or longer, from the measured data, it can be seen that athletes with a low starting point, although they are young, can also make great progress through regular and systematic training. Overall, from the test point of view, all athletes have improved by about 30%-50%, and they have obviously seen a significant improvement, but there are individual differences. In the practice process, the amount and intensity of training can be formulated according to the actual situation of the athlete's age, ability and training level, different from person to person, teach students according to their aptitude, and carry out necessary systematic training, ultimately, it must be able to achieve the purpose of improving the athletes' special ability and physical fitness.¹⁰

CONCLUSION

The single-person exercises in the core strength training method, including supine top hip exercises, prone exercises, and side support exercises, can significantly improve the physical fitness of gymnasts, especially using the Swiss ball and the two unstable practice methods of standing and squatting with eyes open and closed, it not only strengthens the physical fitness of athletes, but also significantly improves the balance ability of gymnasts. These core strength training methods are indeed of great help for gymnasts to improve their overall athletic ability. Core strength training can effectively improve the physical fitness of gymnasts. When athletes are doing exercises, connections, especially difficult movements, the strong trunk strength saves physical strength for athletes and reduces physical energy consumption, so that athletes can coordinate their limbs to exercise more quickly and accurately.

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

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