

INFLUENCE OF SWIMMING TRAINING ON FITNESS INDICATORS IN CHILDREN



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INFLUÊNCIA DO TREINAMENTO DE NATAÇÃO SOBRE OS INDICADORES DE APTIDÃO FÍSICA EM CRIANÇAS

INFLUENCIA DEL ENTRENAMIENTO DE NATACIÓN EN LOS INDICADORES DE APTITUD FÍSICA DE LOS NIÑOS

Cencen Tian¹ 
(Physical Education Professional)

Ling Yu² 
(Physical Education Professional)

1. Guizhou Medical University,
Department of Sport and Health,
Guiyang, Guizhou, China.

2. Shanghai Lixin University of
Accounting and Finance, School
of Physical Education and Health,
Shanghai, China.

Correspondence:

Ling Yu
Shanghai, China. 201209.
yuling20180717@163.com

ABSTRACT

Introduction: The specialized technical teaching and swimming training methods for children are the basis for improving the effect of swimming training and reducing the occurrence of sports injuries. In recent years, swimming physical training technology in China has developed rapidly. Swimming physical training for children can improve the comprehensive sports quality of young people. **Objective:** In this paper, the indexes of 50m butterfly and 50m breaststroke were determined. These data quantitatively examine the effect of the program on swimming performance. **Methods:** 18 children and adolescent swimmers participated in the sample analyzed in this study. In this paper, 18 participants were divided into experimental and control groups. These groups have four swimming styles: butterfly, breaststroke, backstroke, and freestyle. **Results:** After two months of coordination exercises, the performance of butterfly and frog swimming was partially improved. There were significant differences in the data ($P < 0.05$). **Conclusion:** The fitness training process can improve the overall quality of athletes. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Child; Swimming; Physical Education and Training; Resisance Training.

RESUMO

Introdução: O ensino técnico especializado e os métodos de treinamento em natação para crianças são a base para melhorar o efeito do treinamento de natação e reduzir a ocorrência de lesões esportivas. Nos últimos anos, a tecnologia de treinamento físico em natação na China se desenvolveu rapidamente. O treinamento físico da natação para crianças pode melhorar a qualidade esportiva integral dos jovens. **Objetivo:** Neste artigo, foram determinados os índices de 50m de borboleta e 50m de peito. Estes dados examinam quantitativamente o efeito do programa sobre o desempenho da natação. **Métodos:** Um total de 18 crianças e adolescentes nadadores participaram da amostra analisada neste estudo. Neste trabalho, 18 participantes foram divididos em grupos experimentais e de controle. Estes grupos têm quatro estilos de natação: borboleta, nado de peito, nado de costas e estilo livre. **Resultados:** Após dois meses de exercícios de coordenação, o desempenho do nado borboleta e do nado sapo foi parcialmente melhorado. Houve diferenças significativas nos dados ($P < 0,05$). **Conclusão:** O processo de treinamento de aptidão física pode melhorar a qualidade global dos atletas. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Criança; Natação; Educação Física e Treinamento; Treinamento de Força.

RESUMEN

Introducción: La enseñanza técnica especializada y los métodos de entrenamiento en natación para niños son la base para mejorar el efecto del entrenamiento de natación y reducir la aparición de lesiones deportivas. En los últimos años, la tecnología del entrenamiento físico de la natación en China se ha desarrollado rápidamente. El entrenamiento físico de natación para niños puede mejorar la calidad deportiva integral de los jóvenes. **Objetivo:** En este trabajo se determinaron los índices de 50 metros mariposa y 50 metros braza. Estos datos examinan cuantitativamente el efecto del programa en el rendimiento de la natación. **Métodos:** Un total de 18 niños y adolescentes nadadores participaron en la muestra analizada en este estudio. En este trabajo, 18 participantes fueron divididos en grupos experimentales y de control. Estos grupos tienen cuatro estilos de natación: mariposa, braza, espalda y estilo libre. **Resultados:** Tras dos meses de ejercicios de coordinación, el rendimiento de la natación en mariposa y rana mejoró parcialmente. Hubo diferencias significativas en los datos ($P < 0,05$). **Conclusión:** El proceso de entrenamiento físico puede mejorar la calidad general de los deportistas. **Nivel de evidencia II; Estudios terapéuticos - investigación de los resultados del tratamiento.**

Descriptor: Niño; Natación; Educación y Entrenamiento Físico; Entrenamiento de Fuerza.



INTRODUCTION

The cultivation of children's basic sports skills in sports competitions has increasingly attracted the attention of researchers. This article has carried out relevant research on the cultivation of children's physical fitness, endurance, speed, etc. These studies have a critical link to children's physical fitness and speed. In recent years, the physical training technology in swimming in China has developed rapidly. Physical fitness training in children's swimming events can improve the comprehensive physical quality of young people.¹ These exercises improve their balance on the water. Athletes need to have a strong body, muscular waist, and abdominal muscles. These measures can ensure that athletes get adequate physical fitness during the competition. In the "hand and foot coordination" movement, the coordination exercise of athletes will be significantly improved. Despite realizing the importance of coordination, some essential training methods and methods are often overlooked by researchers. These methods include aspects such as motor coordination exercises.

METHOD

Research objects

18 child and adolescent swimmers participated in the sample studied in this paper. In this paper, 18 athletes are divided into experimental groups and four control groups.² These groups have four swimming styles: butterfly, breaststroke, backstroke, and freestyle.

Investigation method

The training methods of the experimental group are as follows: A. Athletes complete various unfamiliar sports on the water or use various sports. B. Athletes change the way they used to exercise. C. The athlete's path changes during swimming. D. Athletes perform repetitive movements through competition. E. Athletes cooperate with teammates during the battle. F. Athletes train for a specific swimming posture. We ask players to change their body position. G. Athletes use field equipment whenever possible when performing repetitive training sessions. Each exercise is 25-30 minutes apart. The course is 25 to 50 meters. The number of times the athlete directly cooperates with the training is about 1000 meters, and the total daily training is 3000 meters. The schedule lasts over two months.

In this study, the control group was carried out according to the traditional training method. The research content of this paper is to do four swimming events in one day, and the distance of each event is 50 meters. In the study, four different swimming positions were added, and the coordination of skills was emphasized. The main exercise range studied in this paper is 25-50 meters. the control group take exercise 3000 meters a day. The schedule lasts more than two months. In this paper, various indices of 50m butterfly and 50m breaststroke were determined. These data quantitatively examine the program's effect on swimming performance.³ This paper uses statistical methods to analyze the original data obtained from the experiment.

Swimming mechanics problems

When the palm is stroked, the speed of the water flowing through the palm surface decreases, and the pressure on the palm surface increases. The speed of the water passing the back of the hand increases, so the pressure on the back of the hand decreases. The pressure difference between the two forms the force of the water flow on the oncoming palm.⁴ This force is the swimming propulsion. In the direction of human travel and its vertical direction, the propulsive force can be decomposed into two components: swimming resistance and swimming lift, which are:

$$F_1 = \frac{C_1 \rho g M v^2 \cos \theta}{3} \quad (1)$$

$$F_2 = \frac{C_2 \rho g M v^2 \sin \theta}{3} \quad (2)$$

Among them F_1 , F_2 is the motion resistance and lift, respectively, C_2 , C_1 is the propulsion resistance and lift coefficient, M is the water-facing area of the stroke limb, and v^2 is the water velocity.

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

RESULTS

The nine child swimmers in the experimental group performed special coordination exercises in the water for more than two months.⁵ The control group used traditional training methods. The results of the 50-meter butterfly and frog strokes before and after the test were counted down. (Table 1)

After more than two months of coordination exercises, the performance of butterfly and frog poses has improved to some extent. There are stark differences in the data. The nine contestants in the control group also improved their performance within more than two months.⁶ But the speed at which these movements improved compared to the experimental group was not significant. It can be seen that the combination of butterfly and breaststroke exercises is an excellent way to improve the overall quality of athletes. The butterfly is more complicated. This exercise requires excellent upper arm and lower back muscle and coordination. The up-and-down movement of the waist and waist is difficult to get used to. Players will be better able to familiarize themselves with various movements and achieve better performance in the competition.

On the other hand, breaststroke requires precise coordination of the power sequence of the hands and feet. When performing coordination exercises, athletes have to master their posture and find the maximum thrust in balance coordination.⁷ This is also very beneficial for improving the level of breaststroke.

After more than two months of continuous coordination exercises, the athletes' muscles felt precise and powerful. It is especially effective for improving butterfly strokes.

DISCUSSION

Pay attention to children's comprehensive physical development

The cultivation of land sports should pay attention to children's comprehensive physical ability, technical ability, and essential technical ability. Athletes need to pay attention to the training of children's flexibility, physical coordination, flexibility, and other comprehensive abilities.⁸ With the continuous improvement of children's various functions and ages, the training of special abilities should also be improved accordingly. Increase the intensity and intensity of training according to the child's specific situation.

Table 1. Comparison of butterfly and breaststroke performances between the experimental group and the control group of children's swimmers before and after the experiment.

Test indicators	Before experiment	After the experiment	Poor grades
Experimental group 50m butterfly	41.8±0.75	40.04±1.06	1.76±0.41
Experimental group 50m breaststroke	47.96±1.29	46.53±1.39	1.43±0.34
Control group 50m butterfly	43.45±1	42.79±0.74	0.66±0.42
Control group 50m breaststroke	47.63±0.65	47.08±0.64	0.58±0.17

Focus on cultivating children's core strength

In swimming competitions, athletes must perform corresponding movements in the water. The body of the athlete in the water has no fixed support. The athlete must concentrate all of his strength to maintain balance in this situation. Swimmers must have the core strength to perform well in the competition. It works in perfect harmony with the forces around the joints.⁹ In swimming, the training of sports such as track and field and boxing can be combined with the training methods of other sports. This improves the athlete's fitness and coordination. Coordination in child athletes is a highly complex quality, and there is a strong link between the sport and qualities such as speed, strength, and endurance. Good coordination is a physiological basis for aerobics.¹⁰ Child athlete coordination and mental agility are closely related. There are several main reasons children's swimming teams improve their athletic ability. One of the essential factors is physical fitness. Improving children's comprehensive quality is an effective way to improve children's comprehensive quality.

In developing children's swimming, comprehensive quality, 6 to 9 years old, is a critical period for children's comprehensive quality development. Children between the ages of 9 and 14 are a critical period for a particular development. Therefore, cultivating children's swimmers' coordination ability has become a critical issue in the current land swimming teaching.¹¹ This requires grasping the sensitivity of children's coordinated development in children's swimming training. This can improve the competitive level of Chinese children's martial arts and youth swimming skills. At the same time, it can also improve the overall coordination of their movements.

Flexibility in child swimmers can improve their athletic ability. The flexibility training of child swimmers improves their strength, speed, and coordination. It can also reduce sports injuries. There are significant age differences in children's physical flexibility in swimming on land. Children swimmers should pay attention to the following points when they perform

flexibility exercises on land: First, the main points of flexibility exercises are emphasized.¹² The development of flexibility in child swimmers should focus on training their shoulders, body, tendons, and ligaments. This is because children's various movements while swimming require a great deal of shoulder and arm coordination.¹³ This requires maximum stretch and flexion. Strengthening the training of children's swimming skills should improve children's technical level and improve children's physique. The second is to improve children's flexibility and developmental abilities. This is the extensive use of flexibility and strength by children while developing children's flexibility. This enables it to develop its physical strength based on improving physical fitness. Third, pay attention to the perseverance in cultivating students' flexibility. Slower movements characterize flexibility in child swimmers. With age, it becomes less flexible and less stable. The athlete's body flexibility also fades over time.¹⁴ Therefore, the flexibility training of child swimmers should be carried out gradually in training, and they should not be rushed to avoid sports injuries.

Swimming has extremely high requirements on the physiological functions and maximal oxygen uptake capacity of the human body. Because children's bodies are still in their infancy, their body tissues during sports have different characteristics than other athletes. The flexibility of child athletes and the training of athletes mainly focuses on extraordinary strength, anaerobic endurance, and endurance. The physical training of children's swimmers has its characteristics.

CONCLUSION

After more than two months of comprehensive practice, the butterfly and breaststroke of the child swimmers have improved to a certain extent. The coach's organic combination of specific training and comprehensive training can improve the valuable skills of athletes.

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