

EFFECTS OF PHYSICAL CONDITIONING ON TEACHING SWIMMING SKILLS TO UNIVERSITY STUDENTS

EFEITOS DO CONDICIONAMENTO FÍSICO SOBRE O ENSINO DAS HABILIDADES DE NATAÇÃO EM UNIVERSITÁRIOS

EFFECTOS DEL ACONDICIONAMIENTO FÍSICO EN LA ENSEÑANZA DE NATACIÓN EN UNIVERSITARIOS



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ABSTRACT

Introduction: Swimming is a sport that requires skill and great physical strength. The effects of its training reflect on the practitioner's motor coordination, body shape, and general physical health. These benefits can provide college students with a teaching foundation for future learning in other skills. **Objective:** Explore the effects of physical training on teaching swimming skills. **Methods:** Forty non-physical education university students were randomly selected and divided into an experimental and control group. The experiment lasted 12 weeks, and the experimental group performed a training protocol stipulated by the researchers three times a week, including 10 minutes of stretching, 45 minutes of physical training, and 10 minutes of cooling down, totaling 65 minutes. The control group performed standard swim training. Swimming skill changes were assessed in the pool and statistically compared; the indicators were collected and analyzed. **Results:** The experimental physical training evidenced its scores in the FMS test, where the control group's improvement was statistically lower. **Conclusion:** The choice of directed sports training can improve the swimming speed of the students and make their movements more coordinated, reflecting greater mastery of the musculature and increase in the level of physical fitness in university students, which is indicated for the integral development of teaching. **Level of evidence II; Therapeutic studies - investigation of treatment outcomes.**

Keywords: Physical Education and Training; Swimming; Physical Fitness.

RESUMO

Introdução: A natação é um esporte que exige habilidade e grande força física, os efeitos de seu treinamento refletem na coordenação motora, forma corporal e saúde física geral do praticante. Esses benefícios podem proporcionar aos estudantes universitários uma base de ensino para futuros aprendizados em outras habilidades. **Objetivo:** Explorar os efeitos do treinamento físico no ensino das habilidades de natação. **Métodos:** Foram selecionados aleatoriamente 40 estudantes universitários não especializados em educação física, divididos entre grupo experimental e controle. A experiência durou 12 semanas, o grupo experimental efetuou um protocolo de treinamento estipulado pelos pesquisadores três vezes por semana, incluindo 10 minutos de alongamento, 45 minutos de treino físico, 10 minutos de resfriamento, totalizando 65 minutos. O grupo controle efetuou um treinamento de natação padrão. Alterações de habilidade de natação foram avaliadas na piscina e comparadas estatisticamente, os indicadores foram coletados e analisados. **Resultados:** O treinamento físico experimental evidenciou seus escores no teste FMS, onde a melhora do grupo controle foi estatisticamente inferior. **Conclusão:** A escolha do treinamento esportivo direcionado pode melhorar a velocidade de natação dos alunos e tornar seus movimentos mais coordenados, refletindo um maior domínio da musculatura e aumento no nível de aptidão física sobre os estudantes universitários, sendo indicado para o desenvolvimento integral do ensino. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

Descritores: Educação Física e Treinamento; Natação; Aptidão Física.

RESUMEN

Introducción: La natación es un deporte que exige habilidad y gran fuerza física, los efectos de su entrenamiento se reflejan en la coordinación motora, la forma corporal y la salud física general del practicante. Estos beneficios pueden proporcionar a los estudiantes universitarios una base didáctica para el aprendizaje futuro de otras capacidades. **Objetivo:** Explorar los efectos del entrenamiento físico en la enseñanza de la natación. **Métodos:** Se seleccionaron aleatoriamente 40 estudiantes universitarios no especializados en educación física, divididos en un grupo experimental y uno de control. El experimento duró 12 semanas, el grupo experimental realizó un protocolo de entrenamiento estipulado por los investigadores tres veces por semana, que incluía 10 minutos de estiramientos, 45 minutos de entrenamiento físico, 10 minutos de enfriamiento, en total 65 minutos. El grupo de control realizó un entrenamiento de natación estándar. Se evaluaron los cambios en las habilidades de natación en la piscina y se compararon estadísticamente, se recogieron los indicadores y se analizaron. **Resultados:** El entrenamiento físico experimental evidenció sus resultados en la prueba FMS, donde la mejora del grupo de control fue estadísticamente inferior. **Conclusión:** La elección del entrenamiento deportivo dirigido puede mejorar



Descriptores: Educación y Entrenamiento Físico; Natación; Aptitud Física.

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INTRODUCTION

China's swimming events have achieved outstanding results in various competitions in the world. In addition, swimming has a high degree of participation. With the popularization of relevant knowledge and teaching information, swimming can help college students' physical functions. Therefore, this sport is very popular among college students. Swimming is a skill type sport that requires great physical strength.¹ With the development of the project, college students have a deeper understanding of the importance of training links. The training effect is reflected in the process of swimming through organ function, body shape, technical ability and physical health. The purpose of college students' training is to improve their physical quality, so as to improve their sports ability.² As the most important ability in swimming, physical ability plays a very important role in training. With the continuous innovation and improvement of China's swimming training system, more scientific training methods have been adopted by college students.³ Moreover, physical fitness provides the most basic guarantee for all technical movements. Excellent physical ability can enable college students to better complete technical movements. At the same time, making efficient physical training plans for college students can provide more convenient conditions for the skills teaching link later. Moreover, swimming is a dangerous sport. In many accident cases, sports accidents due to insufficient physical strength account for a large proportion. Therefore, physical training is the basis for college students to swim.⁴ Physical training can comprehensively improve college students' sports ability and sports level. Help college students complete skill training more efficiently. In addition, physical training should focus on all-round training, instead of developing unilateral physical strength. The comprehensive physical quality of college students can be effectively improved through various physical training to enhance their group sports experience.⁵ Based on the above reasons, this paper takes a college student as the research object to explore the effect of physical training on their swimming skill teaching.

METHOD

In this paper, 40 college students who are not specialized in physical education in a university were selected and divided into two groups according to the form of random sampling. The study and all the participants were reviewed and approved by Ethics Committee of Jiangsu University (NO.2019JSUI062). Details are as shows in Table 1, and $P > 0.05$ indicating that there is no significant difference in the classification of this lottery.

This paper adopts the method of controlled experiment. The two groups of college students are divided into experimental group and control group, each group has 18 people, and the whole experiment period is 12 weeks. During the period, the experimental group trained according to the physical training set by the researchers, three times

Table 1. Basic information analysis of two groups of College Students.

Option	Test group	Control group	P
Height(cm)	167.8936±8.6718	168.3682±9.3883	0.69305
Weight(kg)	57.3233±7.6257	55.9887±10.5223	0.17378
Age	19.9740±0.3987	19.6817±0.6101	0.12950

a week, each time including 10 minutes of stretching training, 45 minutes of physical training and 10 minutes of relaxation training, a total of 65 minutes. The control group simply completed some swimming physical training in the form of repeatedly waving hands and lifting legs on the land according to the teaching of swimming in traditional physical education classes. In terms of venue selection, the observation of physical fitness change and sports injury prevention of college students is carried out in the indoor gymnasium on the land, so as to prevent the impact of the external climate environment on college students' sports performance. The observation of changes in swimming skills is carried out in the swimming pool. Before the beginning of the experiment and after the 12 week experiment, the above indicators of students were observed uniformly, and their data were collated and analyzed.

RESULTS

Improvement of physical fitness of college students by physical training

Table 2 shows the influence of physical training on college students' physical fitness. Although these physical abilities are measured on land and have no direct connection with swimming, they can indirectly reflect the physical quality of students, thus proving the effect of existing physical training.

It can be seen from Table 2 that in the course of 12 weeks, both the experimental group and the control group have achieved a certain improvement in physical fitness. During the 12 weeks, other sports training and simple skill teaching training in the classroom will be carried out, so there is a certain relationship between the physical improvement of the control group and its presence. In addition to the regular physical education teaching, the physical fitness training of the experimental group also has the unique physical fitness training effect. It can be seen from the comparison between the two groups that the control group also achieved a certain improvement in 12 weeks, $P < 0.05$, indicating that there is a significant difference, which proves that other daily sports have a certain impact on the physical quality of students. However, the improvement range of the control group is far less than that of the experimental group, which shows that the physical training effect of the experimental group is far greater than that of the control group, which also proves that targeted physical training in swimming teaching can better improve the physical quality of students.

Prevention of physical training on college students' swimming injury

Table 3 shows the changes of college students' FMS test scores before and after physical training. In the process of physical education teaching for ordinary college students, the prevention of sports injuries is the focus of many teachers. If sports injuries are caused in the process of sports training, it will affect students' enthusiasm for sports and teaching effect, which will have a negative impact on students' bodies and cause teaching accidents. Therefore, in this section, the prevention effect of

physical training on college students' swimming injury is discussed, and the commonly used FMS test is selected as the judgment index, and the three-point system is used for scoring. The higher the score is, the better the relevant movements are mastered and the smoother the movement process is; The lower the score is, the more unfamiliar and difficult it is in the whole exercise process.

It can be seen from Table 3 that after 12 weeks of experimental training, the FMS scores of the two groups of college students have improved to a certain extent, which indicates that the students are smoother in performing related actions and have higher scores, thus reducing the risk of sports injury during the exercise. Through the comparison between the two groups, it can be seen that the improvement range of the control group score is smaller than that of the experimental group, indicating that the traditional sports skill teaching can provide a certain impetus for the change of college students' FMS test scores, thereby reducing the risk of sports injury, but its effect is not as good as the targeted physical training proposed in this paper. It can be seen from the overall scores of the two groups that although most of the experimental groups have reached more than two points after the experiment, indicating that their scores are good, there are still some low scores. Therefore, in the process of sports teaching, PE teachers also need to strengthen the standardization and inspection of their movement skills to prevent sports injuries.

Improvement of college students' swimming skills through physical training

In terms of the improvement of college students' swimming skills, the slow swimming time and the scores of college students' swimming skills were selected as the reference objects, as shown in Table 4.

It can be seen from Table 4 that through effective targeted physical training, the students in the experimental group have significantly improved their swimming speed and swimming score. Although the control group has also improved to some extent, the effect is not obvious compared with the experimental group, which shows that the targeted physical training proposed in this paper can better improve the swimming skills of college students.

DISCUSSION

Physical strength includes strength, endurance, speed, coordination and sensitivity. Moreover, physical training is the most important part of a complete training system. Generally speaking, physical training aims to improve sports performance and explore the upper limit of its potential. In the process of swimming, it is necessary to adjust its own motion state and posture in real time through the excellent strength attribute of the body. Due to the particularity of swimming events, the environmental resistance in water is far greater than that in air during sports. Therefore, the level of physical energy consumption of swimming events is also higher than that of some conventional sports events. In the existing physical training system, there are several links for targeted training. The first is core strength training. The body is in an unbalanced state during the movement in water. The balance of the whole body cannot be supported by the strength of the lower limbs as in the ground environment. Therefore, in the water, the power of the core muscle group in the waist and abdomen is extremely important. Secondly, lower limb strength training. In the process of swimming, there are many technical movements in which the legs participate. Excellent leg strength helps college students have faster speed ability. Third, it is the role of upper limb strength. Through the project characteristics of swimming, you can intuitively feel the process of arm participation in sports. According to the technical needs, during the movement, you can control the movement state of the water by adjusting the amplitude and frequency of the stroke. Therefore, through upper limb strength training, we can effectively improve the ability to adjust the movement state. The fourth is the training of endurance attributes. Endurance is very important in swimming physical training. Among them, exercise intensity and exercise often put forward higher requirements for endurance. In addition, the core content of swimming is also the endurance leading event. Therefore, during training, improving muscle endurance and cardiovascular endurance is an effective way to improve project performance. Flexibility training cannot be ignored in the project. Having good flexibility means that joints and muscles can easily meet sports requirements. The physical health of college students is very important. Through a scientific training system, the physical quality of college students can be effectively improved.

Table 2. Changes in physical fitness of college students before and after physical training.

Project	Test group			Control group		
	Before	After	P	Before	After	P
Throw the ball with both hands	12.8980±3.9145	15.1192±4.1179	0.00200	12.9643±3.5078	13.2621±3.5614	0.01199
Standing long jump	2.0674±0.3090	2.2461±0.3695	0.01922	2.0375±0.2791	2.1148±0.3096	0.02125
30 meters running	5.1600±0.5881	4.7741±0.4270	0.02024	5.1522±0.6579	5.0037±0.4677	0.04755
5*25 meters	41.4837±4.1988	38.6144±5.2207	0.02797	41.0363±5.1600	40.4948±5.0993	0.02397

Table 3. Changes of college students' FMS test scores before and after physical training.

Project	Test group			Control group		
	Before	After	P	Before	After	P
Squat	1.7474±0.4556	2.1567±0.3443	0.00102	1.8772±0.6278	1.9643±0.5771	0.59075
Step by step	1.9671±0.5192	2.3528±0.4769	0.02037	1.7212±0.5792	1.9148±0.4968	0.44001
Straight bow and arrow step	2.1758±0.5311	2.5463±0.5265	0.01997	1.8678±0.7081	2.0371±0.6379	0.57915
Shoulder flexibility	2.6261±0.6315	2.9190±0.3463	0.10530	2.6261±0.7333	2.7264±0.6111	0.33717
Active knee -to -knee lifting legs	2.0949±0.6284	2.5921±0.5016	0.01426	2.0261±0.5777	2.1567±0.4918	0.33917
Stable push -ups of trunk	1.5577±0.7180	1.8345±0.7489	0.04073	1.1883±0.3934	1.3277±0.4793	0.16294
Trimit rotation stability	1.6791±0.4769	2.0879±0.2546	0.00899	1.7387±0.4471	2.0271±0.0000	0.04094

Table 4. Changes in swimming skills of college students before and after physical training.

Project	Test group			Control group		
	Before	After	P	Before	After	P
Slow tour (S)	183.4009±8.9569	136.1966±7.3820	0.00374	182.5638±9.7710	159.8025±8.4243	0.07551
score	67.5356±3.4524	78.5244±3.5652	0.00235	66.4576±4.3521	70.6342±3.4524	0.04513

CONCLUSION

Swimming can not only improve the physical quality of students, but also enable students to have more self-protection ability in the face of emergencies. Therefore, many colleges and universities have joined the swimming course. Strengthening the swimming ability of nonprofessional college students is also the focus of many PE teachers. The research results of this paper show that selecting targeted sports training can better

improve the students' swimming speed and make their movements more standard, which can not only give full play to the effect of swimming to strengthen the body, but also increase the quality level of college students, thus promoting the all-round development of college students.

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