



# The Influence of Swimming Sports on Teenagers' Physical Health

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**Abstract:** Long-term adherence to swimming is conducive to improving the human heart and lung endurance, improving the function of the respiratory system, improving the metabolism and the ability of the muscle system, treating and preventing chronic diseases, etc. Swimming has a strong and practical value in military, production, survival skills and life services. Guiding teenagers to actively participate in swimming can improve their physical health and promote the formation of their lifelong awareness of physical exercise. In this paper, the students of a university in Nanchang (non-sports major) are taken as the research object, and the physical health of young swimmers is investigated experimentally by using the method of literature, questionnaire, test and mathematical statistics. The findings of the study show that: After 12 weeks of planned intervention exercise, the BMI of male students was  $22.32 \pm 3.17$ , that of female students was  $19.24 \pm 2.54$ , that of female students was  $58.24 \pm 0.25$ , that of female students was  $53.14 \pm 2.15$ . In terms of physical fitness, After intervention, sit-up in boys  $41.25 \pm 2.12$  and girls  $30.25 \pm 1.24$ , 50m boys  $7.51 \pm 1.65$  and girls  $8.78 \pm 3.25$ , standing long jump in boys  $2.45 \pm 2.21$  and girls  $2.16 \pm 1.68$ , respectively. Men's 1000 meters  $4.15 \pm 3.76$ , women's 800 meters  $4.21 \pm 2.89$ , grip strength  $37.2 \pm 1.24$  boys,  $30.21 \pm 1.21$  girls, swimming sports can reduce body fat content, improve vital capacity and vital mass index, improve physical function and enhance physical fitness, in addition to sleep has also been effectively improved. It is recommended that teenagers insist on swimming exercise, which can not only improve physical and mental health, but also help to improve learning efficiency.

**Keywords:** swimming; teenagers; college students; physical health.

## 1. Introduction

As we all know, the physical quality of the people determines the comprehensive strength of a country. With the overall improvement of the level of social productive forces in China and the rapid development of mechanization, it has entered the forefront of the world in many aspects, and the level of economic development has been significantly improved, the living standards of residents have been continuously improved, and the people's ideas and consumption levels have been greatly changed. With the advent of the 5G era, insufficient and excessive physical exercise will have adverse effects on health. The study found that physical activity is affected by education level, gender, economic development level and regional differences, and the physical health problems of teenagers are becoming increasingly prominent. In order to solve this problem, more and more people began to pay attention to the impact of sports on the physical health of teenagers. In the emphasis on the integration of sports and education to promote the healthy development of young people, we should train the socialist builders and successors of the new era with all-round development of morality, intelligence, physique, the United States and labor; Among them, swimming sports has been widely concerned and promoted worldwide. As a comprehensive exercise sports project, swimming can not only enhance physical fitness, but also reasonably integrate sports fitness, events, games and entertainment with leisure and entertainment. At the same time, it can also improve people's attention, find a breakthrough for emotional vent, and adjust emotions. Can make the muscles become relaxed, can make people feel physically and mentally relaxed, more happy and healthy, has a unique advantage in adolescent physical development and health, is the best sport in the 21st century.

Du Ray research found that 60 female students who adhere to 10 months swimming exercise, before and after exercise body composition and cardiopulmonary function test analysis and comparison, the results show that, Long-term swimming exercise can reduce the percentage of body fat of female college students to a certain extent, reduce weight, slow down the quiet heart rate and respiratory rate, reduce blood pressure, and improve lung capacity<sup>[1]</sup>.

It is suggested that swimming exercise is beneficial to keep college students fit and improve their cardiovascular and respiratory system functions. Whether the teenagers' concentrated participation in swimming training will have an impact on their physical health? This paper will conduct 12-week systematic and planned swimming teaching for non-sports majors in a university in Nanchang City. After the experimental teaching, the physical fitness indexes of college students before and after the experiment are tested and compared. To study the important basis of swimming for teenagers' physical health<sup>[2]</sup>.

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## 2. Research purpose

In this study, the swimming sports program was used to test the physical health of adolescents. The 12-week planned swimming sports program was used for experimental intervention to explore the impact of swimming sports on the physical health of adolescents, which provided theoretical and practical basis for colleges and universities to apply the method of increasing physical activities and carry out physical health intervention of college students.

## 3. Research object and method

### 3.1 Research object

400 college students (non-sports majors), 200 boys and 200 girls from a university in Nanchang were elected. The selection and exclusion criteria of research objects are shown in Table 1 and Table 2.

Table 1 Research object selection criteria

Select standard content
① The grade range is from freshmen to seniors (non-sports majors);
② Students who have no obvious movement disorders and are physically sound and healthy;
③ Students without bad habits;
④ no acute disease or cold and fever, diarrhea, etc. in the past month;
⑤ Volunteer to participate in this study and sign the informed consent;

Note: All requirements (1 to 5) above must be met to be included in the study.

Table 2 Exclusion criteria for study subjects

Excluded standard content
① There may be aggravated neuromuscular and skeletal muscle diseases during exercise;
② The heart, liver, spleen, kidney and other major organs are sick, clearly diagnosed cardiopulmonary diseases;
③ Students with mental or physical disorders that prevent them from exercising normally;
④ Students in the recovery period after surgery who are advised by doctors not to exercise;
⑤ Students majoring in physical education are not allowed to participate;

Note: Those who meet any of the above criteria (1 ~ 5) will not be selected for this study.

## 3.2 Research Methods

### 3.2.1 Documentation method

The method of querying literature in this thesis is to use CNKI, Wanfang and Internet query, search, periodical index, newspaper subscription to obtain relevant supporting materials, and consult relevant news materials, mainly in the fields of "swimming", "teenagers", Keywords such as "college students" and "physical health" search and download relevant literature, search the Chinese paper periodical database, domestic and foreign sports journals related to this article in recent years, read the materials in detail, and extract them, and learn from the effective and mature teachings of the predecessors Research results, and excerpts, comprehensively understand the latest developments and past hot spots in the field related to this thesis, analyze current domestic and foreign topics and hot trends, and provide theoretical basis and help for thesis writing.

### 3.2.2 Experimental method

According to the arrangement of college students' public physical education courses, subjects are trained 3 times a week, with Monday, Wednesday and Friday as training time, and each swimming training is controlled at 60 minutes, a total of 12 teaching weeks, and the training items and exercise intensity are controlled at Moderate intensity, maximum heart rate 130-150 beats/min, exercise time is 15:00-16:00 every afternoon. Emphasize humanization, sustainability, sportiness and scientific communication during the intervention, reduce the psychological resistance of the subjects during the intervention process, and eliminate interference such as negative effects (see Table 1 for specific arrangements).

Table 3 Swimming exercise intervention program

Intervene time	Plan time	teaching content	form of intervention	of training intensity

Every Monday, Wednesday, Friday	1h each time	<ol style="list-style-type: none"> <li>1. Familiar with water (walking in water, jumping forward in water, holding breath in water, exhaling, floating and sliding);</li> <li>2. Knee-tucking floating body in water, exhibition body behind the floating body;</li> <li>3. Standing in the water imitating the action of floating body in water and the action of exhibition body;</li> <li>5. Learn breaststroke leg movements, learn breaststroke arm movements</li> </ol> <p>Breaststroke technique and practice together;</p> <ol style="list-style-type: none"> <li>6. Breaststroke technique combined with complete movement practice, there is a certain distance, breaststroke head arm coordination practice (ventilation practice)</li> </ol>	practice intervene	Moderate intensity, maximum heart rate 130-150 beats/min
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Experimental location: In a swimming pool of a university in Jiangxi Province.

Experimental staff: the implementers are physical education students who have undergone the same professional training and guidance, a total of 4 people, 1 teacher, 1 data statistician, 2 teaching assistants, the main task of the data statistician and teaching assistants is to obey the teacher's instructions All the work tasks arranged, carry out scientific experimental interventions in accordance with the training items, intensity, and programs formulated by the teachers, and focus on urging students to complete the minimum training requirements for each intervention.

Test time: once before and after the experiment; the test indicators mainly include BMI, height, weight (body shape), vital capacity, lung capacity and body mass index (physical function), sitting and forward bending, grip strength, sit-ups, 50 meters, standing long jump, Men's 1000 meters/women's 800 meters (physical fitness), test indicators from three aspects to reflect the results of the impact of swimming on the physical health of young people.

### 3.2.3 Mathematical statistics method

Using SPSS26.0 and WPS worksheets, according to the analysis of the collected information, the data obtained before and after swimming teaching and training are analyzed and concluded, and the paired sample T test in statistics is used for statistical processing, and the experimental results are represented by  $p < 0.05$  Statistically significant difference;  $p < 0.01$  means very statistically significant difference.

### 2.2.4 Logical analysis method

Using the knowledge of logic, the collected data and information are summarized and comprehensively analyzed.

## 4. Results and analysis

### 4.1 Analysis and research on the body shape of young people in swimming sports

Table 4 Comparative analysis of the body shape test results of adolescents before and after swimming (n=400)

Index	Before boys intervene	After boys intervene	Girls Before Intervention	After girls intervene
Weight(kg)	71.2±3.16	68.4±2.18*	65.12±4.17	62.11±2.54*
Height (cm)	168.1±2.56	168.54±2.01	162.4±1.52	162.7±2.24
Scapular skin fold(mm)	25.2 ± 1.53	22.56 ± 1.52*	21.2 ± 1.73	19,6 ± 2.04*
Skin fold on upper arm( mm)	20.2 ± 1.42	18.7 ± 2.52*	17.9 ± 1.83	14.0 ± 1.94*
Body mass index (BMI)	24±2.12	22.32±3.17*	21±1.26	19.24±2.54*

Note: \*\* means very significant difference ( $P < 0.01$ ), \* means significant difference ( $P < 0.05$ )

Table 2:400 students, 200 male and 200 female, in total. After 12 weeks of systematic and planned swimming training arrangement, experimental test data showed that the subjects showed significant differences in body weight (kg), body mass index (BMI), scapular skin fold (mm) and upper arm skin fold (mm) ( $P < 0.05$ ). However, there is no significant difference in height (cm). It can be seen that college students have passed the growth stage and their height has been basically stable. The intervention effect of swimming sports on the height of teenagers at this stage is small, while the intervention effect on weight and BMI indicators is larger, which confirms that long-term adherence to swimming is conducive to the control of body shape and can help teenagers control their weight. Prevention of obesity and related metabolic diseases<sup>[3]</sup>.

## 4.2 Analysis and research on the physical function of young people in swimming sports

Table 5 Comparative analysis of physical function test results of adolescents before and after swimming (n=400)

Index	Before boys intervene	After boys intervene	Girls Intervention	Before girls intervene
vital capacity(ml)	3845±264.1	4614±348.4**	3105±148.2	3816±125.5**
vital mass index	50.27±1.55	58.24±0.25**	45.21±4.55	53.14±2.15**

Note: \*\* means very significant difference ( $P<0.01$ ), \* means significant difference ( $P<0.05$ )

After 12 weeks of systematic and planned swimming training arrangements, it can be known from the test data before and after the experiment that the vital capacity of the male group was 3845±264.1 before the experiment, and 4614±348.4 after the experiment; the vital capacity of the female group was tested before the experiment 3105±148.2, and 3816±125.5 after the experiment; it can be seen that the lung capacity of male and female students showed a very significant difference after swimming ( $P<0.05$ ); the vital capacity and body mass index of the male group was 50.27±1.55 before the experiment, and 58.24±0.25 after the experiment 0.25; the lung capacity and body mass index of the female group was 45.21±4.55 before the experiment, and 53.14±2.15 after the experiment; it can be seen that there is a very significant difference in the lung capacity and body mass index between male and female students after swimming ( $P<0.05$ ). Through swimming, college students can enhance the ventilation function of the lungs, promote blood circulation and oxygen supply, and persist in swimming training for a long time, which can reduce the risk of cardiovascular diseases, such as high blood pressure and heart disease<sup>[4-5]</sup>.

## 4.3 Analysis and Research of Swimming Events on Teenagers' Physical Quality

Table 6 Comparative analysis of physical fitness test results of adolescents before and after swimming (n=400)

Index	Before boys intervene	After boys intervene	Girls Intervention	Before girls intervene
Sit-ups (number)	33.52±1.25	41.25±2.12**	26.15±2.65	30.25±1.24**
Grip(kg)	30.14±2.54	37.2±1.24**	25.45±1.65	30.21±1.21**
seated forward bend(cm)	14.21±0.25	15.25±1.22*	12.95±2.31	13.15±0.26*
50 meters	8.95±2.56	7.51±1.65**	9.12±3.32	8.78±3.25**
Standing long jump(cm)	2.27±1.65	2.45±2.21**	1.95±0.26	2.16±1.68**
Men's 1000m	4.51±3.69	4.15±3.76**	/	/
WOMen's800m	/	/	4.41±5.62	4.21±2.89**

Note: \*\* means very significant difference ( $P<0.01$ ), \* means significant difference ( $P<0.05$ )

Physical fitness is an external manifestation of a person's physical strength, and it has a lot to do with genetics. Correct, scientific and reasonable training methods can effectively improve and improve physical fitness. Demonstrate physical fitness in activities; from the data in Table 3, it can be obtained that after 12 weeks of systematic and planned swimming training, the physical fitness of the adolescent subjects has been improved, and the sit-ups for boys are 41.25±2.12, and for girls 30.25±1.24, 50m boys 7.51±1.65, girls 8.78±3.25, standing long jump boys 2.45±2.21, girls 2.16±1.68, men's 1000m 4.15±3.76, women's 800m 4.21±2.89, grip strength boys 37.2±1.24, girls 30.21±1.21, a total of six indicators showed a very significant difference ( $P<0.01$ ); male and female students have a small change in sitting and forward bending ( $P<0.05$ ); after scientific, reasonable, and planned swimming training can improve endurance, power, arm strength, leg strength, and core strength in teens<sup>[6]</sup>.

According to the data in the table above, after 12 weeks of scientific, reasonable, and planned swimming training, 40 young subjects have been effectively improved in terms of body shape, physical function, and physical fitness; among them, the changes in height index data Minimal, all other index data have changed; According to the survey and research of predecessors, long-term adherence to swimming can prevent and treat chronic diseases, exercise every joint and muscle of the body, and relieve mental stress caused by mental work. The skin of our human body will be in close contact, which can massage and relax; help to improve our sleep quality and duration, reduce the pressure of study and life; improve the self-confidence and self-esteem of teenagers, and cultivate a positive attitude; prevention and

treatment Reduces the risk of osteoporosis and muscle damage; in addition, swimming promotes social interaction, enhancing interpersonal relationships and teamwork skills in adolescents.

## 5. Conclusion

Swimming is a sport that is suitable for all ages. Long-term regular and planned exercise is helpful to improve the physical shape, physical function and physical quality indicators of our teenagers, promote the overall development of the body, and have a good effect on blood circulation, heart and mind. Vascular system and respiratory system are conducive to improvement; after 12 weeks of training, the subjects can increase heart rate and lung capacity in enhancing cardiopulmonary function, enhance cardiopulmonary function, and help prevent cardiovascular diseases; in terms of muscle strength, they can Exercise the muscles of the whole body, especially the muscles of the back, shoulders, arms and legs; it is also an exercise that consumes a lot of calories, which can help people lose weight and fat, enhance immunity, and prevent diseases; it can relax the body and mind and improve sleep quality; In the process of rehabilitation, especially for joint diseases and muscle injuries, it has a good effect. Through swimming, the body shape, body function and physical quality of the human body have been effectively improved and assisted. In terms of mental health, it is easy to improve mental health and reduce stress. Adolescence is often accompanied by increased academic and social pressure, and mental health problems such as anxiety and depression are prone to occur. Swimming has been proven to be an effective way to promote mental health. Swimming can help teenagers release stress, relieve tension, and improve self-confidence and self-esteem; in addition, swimming can also promote neurotransmitters such as dopamine and endorphins in the brain. Releases, uplifts mood and well-being<sup>[7]</sup>.

Any kind of exercise should not be excessive, excessive will bring negative effects and physical harm; they should pay attention to safety when swimming, they should learn the correct swimming posture and skills to avoid accidents; secondly, swimming should be combined with other sports Combine to form a comprehensive exercise program. Adolescents can choose to participate in other cardio, strength training, and flexibility training to improve overall physical fitness. Parents and schools should pay attention to the physical exercise of teenagers, provide a good sports environment and guidance, and encourage them to actively participate in swimming sports. In domestic and foreign research, swimming is mainly based on research literature on teaching training and physical fitness; on water sports therapy, rehabilitation and health care, cognition and learning of swimming skills, research on the combination of swimming technology and technology, swimming equipment design and Research and development and other literature studies are less, and the author believes that in the future, we can study the problem from the above perspectives, fill in the gaps, and provide better protection for the physical health of college students.

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