

The use of fins in initial training of swimmers aged 8-9 years

Kotlyarov Alexey Dmitrievich
 Head of the Department of Theory and Methods of
 Gymnastics and Water Sports
 Ural State University of Physical Culture
 Chelyabinsk, Russia
 ad_kotlar@mail.ru
 0000-0002-3836-8279

Abstract. *The purpose of the article is to find effective means in the initial swimming training for children 8-9 years old. The article aims to justify the effectiveness of the use of fins in swimming training for children 8-9 years old. Materials and methods. The experiment involved 30 children aged 8-9 years (15 boys in the control group and 15 boys in the experimental group, having the same swimming and physical fitness). To substantiate the effectiveness of the developed program, the following research methods were used: pedagogical testing; pedagogical experiment, expert assessment; mathematical statistics. Results. It was proved that the use of fins at the initial stage of swimming training for children aged 8-9 years has a positive effect on technique when mastering the front and back crawl. The obtained data can be used in teaching children.*

Keywords – *swimming training, swimming fitness, swimming styles.*

I. INTRODUCTION

P. Lesgaft [1] admits that swimming is not an inborn way of acting for people. V. Balsevich points out that preschool age is the initial period of the evolution of a person's motor function. This very period is responsible for the foundations of a person's health, physical development, and fitness. Therefore, a scientifically-based and properly organized physical education is of great importance in preschool age [2].

In these areas, a lot of research has been conducted by both Russian and foreign scientists. But, since the material and technical conditions are changing and the boundaries of knowledge are expanding, a scientific and methodological search takes place in the implementation of the tasks. These tasks include the issues of teaching swimming to preschool children, the healing effects of the aquatic environment on the body, and the formation of moral and intellectual abilities in children during lessons [3,4,5].

The possibilities of swimming with young children have long been known. At the same time, a large number of children cannot swim, which often leads to tragic consequences. Currently, according to the Federal State Statistic Service, up to 15% of water accidents occur with children under the age of 14, with a significant number of them occurring at the age of 5-9 years. The number of drowning people in one season reaches 14-15 thousand

people. Therefore, the development of various aspects of swimming training has state significance [6].

This is especially true for children of primary school age, since children of this age are very curious and not careful, and the acquired skills of keeping on the water can save their lives [7].

The theory and practice of sports swimming show that fins can also be used to learn and improve swimming techniques [8]. Despite the variety of fins, fins with a small surface are usually used. In most cases, fins are used to correct footwork in a vertical plane. It is believed that the excessive use of fins can lead to the loss of the so-called "support on the water" when performing movements with the legs. At the same time, the following issues have not yet been solved: the stage of training when the use of fins is possible, the optimal time of their use in training, the sequence of their use and alternation with other exercises. In the scientific and methodological literature, these aspects have not been adequately reflected despite the demands of practice. All these provisions determined the relevance and problem of the study.

II. MATERIALS AND METHODS

The developed program was tested on the premises of the Stroitel swimming pool in Chelyabinsk. There were 72 lessons during the academic year. 45-minute lessons were held twice a week. At the beginning and at the end of the year, we conducted testing. The experiment involved 30 children aged 8-9 years. 15 boys made up the control group and 15 boys the experimental group.

In the control group, training was carried out according to the generally accepted parallel-sequential technique (initial parallel development of the front and back crawl, and then sequential development of the butterfly and breaststroke) without using fins. In the experimental group, training was also carried out based on a parallel-sequential technique using fins. In the experimental group, every third repetition of exercises was performed in fins. At the same time, it is desirable that the exercises with fins be performed both before and after similar movements of the exercises performed. The fins were chosen so that they fitted tightly enough on the child's foot (size 30-32 or 32-34) and did not have a large area of support (lobe), such as the arrow-type fins.

To assess swimming fitness, the following tests were used - the length of gliding in the water; the swimming time of the control segment (50 meters, the front and back crawl); the distance swam without stopping.

The expert assessment was used to evaluate the swimming technique of the four swimming styles. The assessment was carried out by three experts using a five-point scale. The experts analyzed the following data: body position, the effectiveness of movements of the legs and arms, coordination of movements of the arms, legs, and breathing.

To analyze the experimental data, generally accepted methods of mathematical statistics were used [9].

In our program, we proposed to teach children aged 8–9 years how to swim using the following scheme:

At the first stage, which consists of six lessons, young swimmers get acquainted with the concepts of buoyancy, streamlining, balance, and water resistance. At this stage, elementary game-like exercises for the arms and legs are used; exercises for lowering into the water with the head; exhaling into the water (“blowing bubbles”), floating and lying on the chest and on the back; gliding in the water with different positions of the hands (on the chest and on the back).

In the second stage, which consists of six lessons, children learn the foot movements of such swimming styles as the front and back crawl. Leg movements are performed in a vertical plane - alternately. Every third exercise is performed by children using fins.

At the third stage (six lessons), hand movements of swimming styles are studied, such as the front and back crawl. Every third exercise is performed by children using fins.

At the fourth stage (six lessons), the coordination of movements with holding breath is studied. The ratio of the use of fins to ordinary exercises remains the same.

At the fifth stage (six lessons), breathing training is carried out in accordance with the movement of the arms and legs, where every third exercise is performed by children using fins.

At the sixth stage (six lessons), the performance of swimming styles is enhanced, simple turns and starts are studied.

In total, 36 lessons are assigned to the first cycle of training (6 microcycles, 6 lessons each).

The second cycle consists of 18 lessons devoted to the butterfly stroke. When mastering butterfly stroke, the boys of the control group did not use fins, and the young swimmers from the experimental group used fins in the same way as when mastering crawl stroke.

In the third cycle, 18 lessons were devoted to breaststroke. When mastering breaststroke, children of the control and experimental groups followed the same training program, and fins were not used.

III. RESULTS AND DISCUSSION

At the first stage of the first cycle, the training program was the same for boys in the control and experimental groups. As a result, the swimming fitness of children

before the second stage of the first cycle was almost the same (Table 1).

Table I. Swimming fitness in children aged from 8 to 9 years from the control and experimental groups before swimming lessons

Test	CG M± m	EG M± m	p	t
Starfish float (s)	6.1 ± 0.5	5.8 ± 0.4	> 0.05	1.2
Gliding in the water (m)	4.3 ± 0.3	3.9 ± 0.2	> 0.05	0.9
Floating in the water (s)	5.6 ± 0.2	5.2 ± 0.3	> 0.05	0.8

Note: M – the arithmetic mean of the results; m – standard error of the arithmetic mean; t – t-Student criterion; p – significance level; CG – control group; EG – experimental group.

From the second stage of the first training cycle, the boys of the experimental group began to use fins (initially when studying foot movements, then when swimming with holding their breath and in full coordination of movements). Table 2 shows the results of the test.

Table II. The swimming time to 50 meters with various swimming styles in children aged from 8 to 9 years from the control and experimental groups at the second stage

Test	EG M± m	CG M± m	p	t
Front crawl (s)	55.0 ± 3.0	58.8 ± 2.8	p > 0.05	1.4
Back crawl (s)	59.6 ± 3.6	64.8 ± 2.6	p > 0.05	1.5

Note: M – the arithmetic mean of the results; m – standard error of the arithmetic mean; t – t-Student criterion; p – significance level; CG – control group; EG – experimental group.

After 72 lessons, it was revealed that boys from the experimental group had almost the same swimming speed in the 50-m front crawl and back crawl compared to the control group. Swimmers from the experimental group spend 55.0 ± 3.0 s for this distance, and swimmers from the control group require 58.8 ± 2.8 s (p>0.05) for the same distance. When swimming on the back, children from the control group spend 64.8 ± 2.6 s, and the experimental group requires 59.6 ± 3.6 s. There are no statistically significant differences between these indicators (p> 0.05).

At the same time, it was determined (Table 3) that in 50-m freestyle swimming children from the experimental

group perform 36.0 ± 2.3 cycles of movements, and the control group 44.2 ± 2.8 cycles ($p < 0.05$). When swimming on the back, boys from the control group perform an average of 50.2 ± 2.0 cycles of arm movements, and swimmers from the experimental group perform an average of 45.2 ± 2.4 cycles of arm movements ($p < 0.05$).

Table III. The number of cycles of arm movements in the 50-m front and back crawl in children aged from 8 to 9 years from the control and experimental groups

Style	EG M ± m	CG M ± m	p	t
Front crawl (number of cycles)	36.0 ± 2.3	44.2 ± 2.8	$p < 0.05$	2.4
Back crawl (number of cycles)	45.2 ± 2.4	50.2 ± 2.0	$p < 0.05$	2.5

Note: M – the arithmetic mean of the results; m – standard error of the arithmetic mean; t – t-Student criterion; p – significance level; CG – control group; EG – experimental group.

An expert assessment of the technique (Table IV) showed that in the front crawl, back swimming, and butterfly, the boys from the experimental group have higher scores than their peers from the control group ($p < 0.05$). In butterfly swimming, there is a tendency for a higher score, since the results in the experimental group are better recorded but not statistically significant ($p > 0.05$).

Table IV. The expert assessment of swimming styles in boys aged from 8 to 9 years from control and experimental groups (scores)

Style	EG M ± m	CG M ± m	p	t
Front crawl (scores)	3.3 ± 0.6	4.6 ± 0.6	$p < 0.05$	2.4
Back crawl (scores)	3.3 ± 0.6	4.6 ± 0.6	$p < 0.05$	2.4
Butterfly (scores)	3.6 ± 0.6	4.0 ± 0.6	$p > 0.05$	1.8

Note: M – the arithmetic mean of the results; m – standard error of the arithmetic mean; t – t-Student criterion; p – significance level; CG – control group; EG – experimental group.

Using breaststroke and butterfly stroke, children from both groups demonstrated significant errors (in coordination, foot movements), which could be explained by motor inability to learn the rational structure of movements.

IV. CONCLUSION

At this age, the so-called “step” of the swimmer, and not the speed (frequency) of movements, is a priority in the swimming technique. Only in this case, a rational structure of movements is ensured and thereby the prerequisites for an optimal swimming technique are created [10].

When swimming breaststroke and butterfly stroke, we did not determine the speed and step of the swimmers, since these methods are quite difficult to master. So when swimming breaststroke, great importance is given to leg movements and errors (asymmetric movements, leg movements in various planes) which can increase the length of gliding. But since the movements are not technically correct, this does not allow improve the performance of the test. Butterfly is also difficult to master at this stage, since it requires a sufficiently large arm power and specific coordination of the movements of the arms and legs, and is also performed with a large number of errors. However, children should learn these styles of swimming because at this age the intramuscular and intermuscular coordination of movements is formed, which ultimately leads to the formation of a rational technique.

As can be seen from the results of the expert assessment, children from the experimental group received higher marks for the front and back crawl, compared with boys from the control group. Experts noted that boys from the experimental group possess a better technique. This was expressed in the pronounced horizontal position of the body in the water, the elongated step of the swimmer, the rational structure of the movements of the arms and legs (six-stroke crawl).

Thus, the study suggests that the use of fins at the initial stage of training for children aged from 8 to 9 years has a positive effect on the formation of a rational front and back crawl technique.

REFERENCES

- [1] Belits-Geiman, S. V. We study. Moscow: Prosveshcheniye, 1997. 380 p.
- [2] Balsevich V. K. Human ontokinesiology. - Moscow: Theory and practice of physical culture, 2000. 275 p.
- [3] Protchenko T. A., Semenov Yu. A. Teaching swimming to preschoolers and younger schoolchildren: a practical guide. Moscow: Airis press, 2003. 80 p.
- [4] Ganchar, I. L. Technology of teaching swimming. Moscow: Sport Academy Press, 2008. 271 p.
- [5] Krasil'nikov V.L., Erlikh V.V., Mirgorodskaya E.V. New approaches to interpretation of information space in sports training of swimmers on the basis of integration of instrumental technologies. Teoriya i Praktika Fizicheskoy Kultury, 2014. Is. 5, Pp. 71-75
- [6] Bulgakova N. J. Swimming. Moscow: Physical Culture and sport, 2006. 400 p.
- [7] A. Egorova, R. Ibraeva, “Play interaction technique used in training of primary-school children in swimming”, Human. Sport. Medicine, 2016, Vol. 16 (4), Pp. 54-63
- [8] Official website of the all-Russian swimming Federation [Electronic resource] / all-Russian swimming Federation. - Access mode-http: // www.russwimming.ru
- [9] Dyatlov D. A. Practicum on sports metrology. Chelyabinsk : Uralgufk, 2006. 66 p.
- [10] Platonov V. N. System of training athletes in Olympic sports (General theory and its practical applications). Kiev: Olympic literature, 2004. 543 p.