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IMPROVING MOTOR SKILLS THROUGH SPECIFIC AND NON-SPECIFIC MEANS TO SWIMMERS

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Abstract

The constant improvement of physical training and sports activity implies identifying some methods, procedures and means to be effectively put into practice and to help improve the existing ones, the traditional ones, based on the newest objectives of physical training and sports. Unlike other sports, swimming has a particular feature, namely that of being practiced in water, a high density environment that involves resistance when advancing, and this one is much higher than that of the air, snow or ice. To achieve high standard performances, it is insufficient today to do only specific physical training in water, but it is also necessary to do physical training on land, which is characteristic to various sport branches (running, gymnastics, weightlifting). So, we tried to comprise and present holistically the general methods for the development of motor skills, together with those specific to swimming. This paper offers a thorough analysis of the motor function and its components and their development through means which are specific and non-specific to swimming in order to improve children's performance in the field, but also with notable overall benefits in terms of harmonious physical development, increased vital capacity, immunity, or as a means of recovering after injury or from physical or mental disabilities.

1. Introduction

The permanent modernisation of the physical education and sports activity requires finding methods, procedures and means by which to act in practice, as well as the continuous improvement of the existing ones, the traditional ones, based on the new objectives of physical education and sports (Costill, Kenney, & Wilmore, 2015, p. 442). The development of motor skills, as a basic component of motricity, is necessary, since there is no field of activity in which the weight of quality is not significant (Dick, 2003, p. 161). Each branch of sport imposes special requirements in terms of requesting motor (physical) qualities. Unlike other sports, swimming has a particularity, namely that of being practiced in water, a high density environment that involves resistance when advancing, and this one is much higher than that of the air, snow or ice (Marinescu, 1998, p. 9). To achieve value-added performance, today's physical training in water is insufficient, so general physical training on land is also required, which is characteristic to several sport disciplines (athletics, gymnastics, heavy athletics) (Maglischo, 1993, p. 42).

In this paper, we aim to bring together the general methods for the development of motor skills, together with those specific to swimming, depending on the effort characterisation. We grouped the most effective methods and means and planned them over a year of training for level II athletes (children). We also want to show that multilateral physical training (both on land and in water) will improve the values of basic motor skills, which will generate the optimisation of water performance (Dick, 2001, p. 33). The present paper proposes a careful analysis of the motor function and its components and their development through means specific and non-specific to swimming in order to improve children's performance in this activity, but also with notable overall benefits in terms of harmonious physical development, increased vital capacity, immunity, or as a means of recovering after injury or from physical or mental disabilities (Marinescu, 2003, p. 25). The increase in the efficiency of training, of the instructive-educational process requires the establishment of precise goals, of a well-developed, objective and optimised management system, the choice of the most effective methods and means of action (Maglischo, 2003, p. 379).

In this paper, we also aim to underline that, without multilateral physical training (both on land and in water), the performance is hindered, and that the development of motor skills should not be the result of strengthening specific motor skills solely.

2. Research Questions

1. Specific land-based training at this age results in the development of motor skills and implicitly in the improvement of sports performance in water.

2. Developing specific motor skills in level II children will result in improved swimming performance.

3. Purpose of the Study

The aim of our paper is to identify and set up training models by using the most effective methods and means specific and non-specific to swimming, which ultimately should lead to:
- Highlighting and optimising motor skills at the puberty age;

- Applying a system of algorithms specialising in distinctive motor skills over a school year, so that the athletes achieve superior results in water;
- Increasing the motor skill level, with visible results in the water training and in competitions;
- Increasing the selection possibilities for the future level I groups;
- Demonstrating the validity of the methods used and applying tests to track the qualitative development of motor skills.

4. Research Methods

The research methods used were the following:

- study of the bibliographic material in order to get acquainted with the general and particular aspects regarding the theoretical and practical part of the studied problems;
- pedagogical observation during the training lessons, news about drafting certain protocols;
- test method;
- statistical data processing.

The following statistical indicators were used (Popa, 2008, p. 58):

- arithmetic mean;
- standard deviation;
- the coefficient of variation;
- t-Student test.

5. Content and development of the experiment

5.1. The research subjects

The research was conducted on two groups of children (11-12 years old), the control group and the experimental group (10 children per group), from October 2015 to May 2016. In the experimental group, during the general and specific physical training lessons, we acted with the selected structures for the physical training on land and in water. With the control group, we worked in a customary manner, according to the curriculum requirements. Both the experimental and control group pupils were subject to the initial testing in October 2015 and the final testing in May 2016.

5.2. Test description and materials required

- Swimming speed - 25m crawl: a speed test that measures the time (in seconds) elapsed in the crawl motion move over a distance of 25m. This test assesses muscle strength and explosion. The time from the first move on the starting block to the finish line is measured.
     *materials required: whistle, stopwatch
- Endurance running - 600m: an endurance test that measures the time (in seconds) elapsed in running over a distance of 600m. This test assesses muscle and cardiac respiratory endurance. The time from the first move to the finish line is measured.
     *materials required: whistle, stopwatch

5.3. Findings

Table 01 shows the results in the speed trial, which are analysed for the two groups, and in Figure 01, the average scores achieved by the two groups in both tests are compared.

Table 01. Statistical interpretation – "Swimming speed - 25m crawl" trial

Group	Statistical indicators						
	Testing I			Testing II			
	X	S	CV	X	S	CV	x2 – x1
Experiment	17.53	± 0.6	3.42%	16.72	± 0.69	4.12%	- 0.81
Control	17.80	± 0.42	2.35%	17.44	± 0.42	2.40%	- 0.36
Difference	-0.27	± 0.18	1.7%	-0.72	± 0.27	1.72%	- 0.45

The swimming speed trial is particularly significant in terms of the increase in speed and performance, so it is very difficult to improve performance on such a short distance. By calculating the arithmetic mean in the initial testing, it can be seen that the experimental group has an average of 17"53, and the control group, of 17"80. The performance has close values. Following the differential training applied to the experimental group, a performance improvement of 16"72 is observed in the final testing, with a progression of 1"21, compared to the performance of 17"44 recorded by the control group, where the progression is 0"36 hundredths.
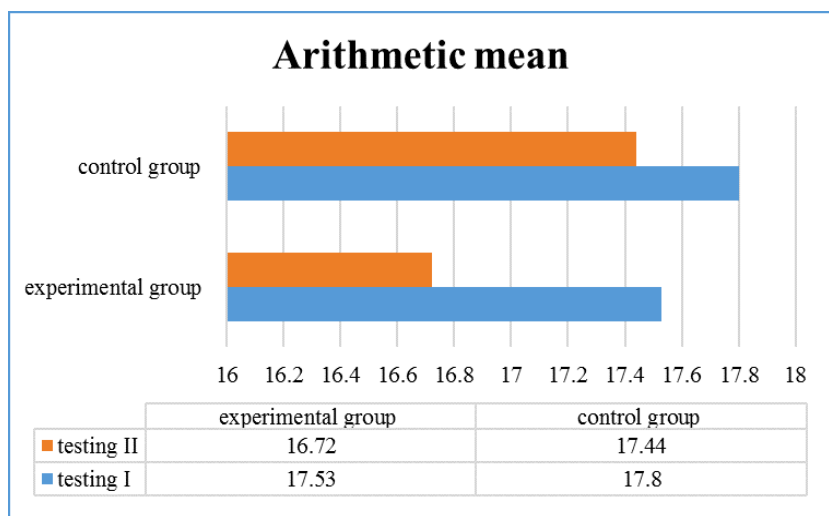

Figure 01. Statistical interpretation – the arithmetic mean of the results obtained by the two groups in the "Swimming speed - 25m crawl" trial

Standard deviation in the initial testing is very close in terms of value - 0.6 for the experimental group and 0.42 for the control group, but the standard deviation value of the experimental group is closer to ±1. In the final testing, standard deviation in the experimental group slightly changes from 0.69 to 0.42 in the control group. The coefficients of variation in both tests for the experimental and control groups (3.42-4.12 experimental group and 2.35-2.40 control group) show low dispersion, thus high homogeneity in both groups. Homogeneity is high because it is very hard to improve performance in speed trials.

Table 02 shows the results in the endurance trial, which are analysed for the two groups, and in Figure 02, the average scores achieved by the two groups in both tests are compared.

Table 02. Statistical interpretation – "Endurance running - 600m" trial

Group	Statistical indicators						
	Testing I			Testing II			
	X	S	CV	X	S	CV	x2 – x1
Experiment	03.38	± 0.24	7.58%	03.00	± 0.32	11.33%	- 38sec
Control	03.40	± 0.23	7.18%	03.18	± 0.30	9.77%	- 22sec
Difference	-0.02	± 0.01	0.40%	-0.18	± 0.02	1.56%	- 16sec

This trial tests the students' endurance to cyclical effort. While initially the results of the two groups had close values, 3.38 for the experimental group and 3.40 for the control group, we note that in the final test, after the differential work, the values are different as follows: for the experimental group, the arithmetic average is 3 vs. 3.18 for the control group; the experimental group has a much better average performance than the control group; the progress achieved by the experimental group is 35", while in case of the control group, which was customarily trained, the progress is only 22" on average.
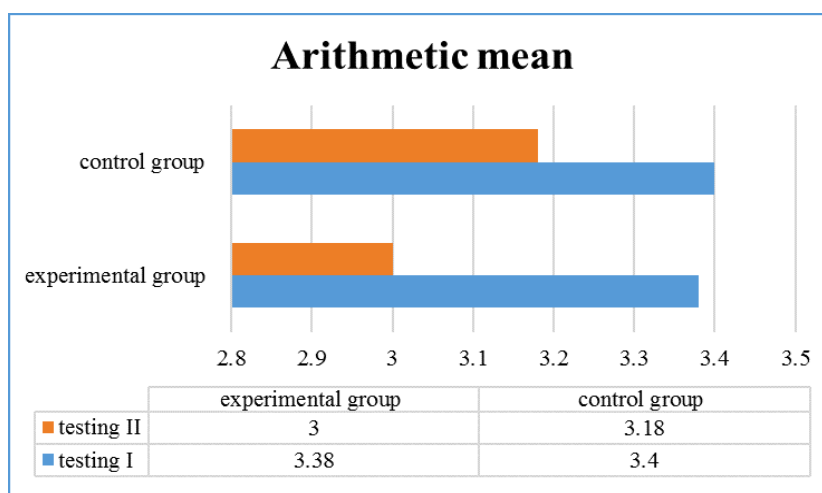

Figure 02. Statistical interpretation - the arithmetic mean of the results obtained by the two groups in the "Endurance running - 600m" trial

By comparing standard deviations, we find a deviation of 0.24 in the control group in the initial testing, and in the final testing, the values of standard deviations are close, 0.32 for the experimental group and 0.30 for the control group, which do not represent significant differences; the values of the coefficient of variation, 7.58 for the experimental group and 7.18 for the control group in the initial testing, show us that both groups have high homogeneity and low dispersion. In the final test, the experiment group has a coefficient of variation of 11.3, so average dispersion and homogeneity. The control group has a coefficient of variation of 9.77, so low dispersion and high homogeneity. The difference between groups is small, 1.56 for the coefficient of variation, the experiment group being at the lower limit of the class to which it belongs (10-20%), and the control group at the upper limit of the class (0-10%). The experimental group results are slightly influenced by the children's extremely good results.

6. Statistical interpretation of t-Student test

After calculating the value of t-Student test for all averages recorded in the trials, we found the critical value at 2.145. The absolute value of calculated t is smaller than the critical value (0.2451<2.145), so the means are not significantly different.

7. Conclusion

- It can be concluded from all data and interpretations that if a training model group is applied a well-dosed and well-spaced algorithm and if specific and non-specific training is judiciously planned, this will lead to higher indices regarding the development level of motor qualities and implicitly to performance improvement and increased efficiency of the training lesson;
- We can see that specific physical training on land results in the development of basic motor skills, which greatly improves the athlete's performance in water;
- The proper use of land-based specific and non-specific training will lead to increased performance and the development of specific motor skills;
- In conclusion, the multilateral and specific development of motor qualities is required as a first condition for improving the performance of swimmers;
- Specific land-based training at this age results in the development of motor skills and implicitly in the improvement of sports performance in water – question 1 confirmed;
- Developing specific motor skills in level II children will result in improved swimming performance – question 2 confirmed.

References

Costill, D. L., Kenney, W. L., & Wilmore, J. H. (2015). *Physiology of sport and exercise* (6th edition). USA: Human Kinetics.

Dick, H. (2003). *Coaching swimming successfully*. USA: Human Kinetics.

Dick, H. (2001). *The swim coaching Bible* (Vol. 1). USA: Human Kinetics.

Maglischo, E. W. (1993). *Swimming even faster*. Pennsylvania: Mayfield.

Maglischo, E. W. (2003). *Swimming fastest*. USA: Human Kinetics.

Marinescu, Gh. (1998). *Copiii şi performanţa în înot*. Bucureşti: Ed. Institutului Naţional de Informare si Documentare.

Marinescu, Gh. (2003). *Nataţie – Efort şi antrenament*. Bucureşti: Bren.

Popa, M. (2008). *Statistică pentru psihologie – Teorie şi aplicaţii SPSS*. Iaşi: Polirom.