

OPTIMIZING THE PERFORMANCE OF JUNIOR SWIMMERS BY DEVELOPING GENERAL STRENGTH

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Abstract: Swimming is a cyclical sport branch and through its practice, children benefit from the harmonious development of motor qualities and skills. In order to learn the styles of swimming, the improvement of motor qualities is necessary, of which the most important are: reaction speed, coordination of body segments, explosive force and endurance. Swimming can be done by children from an early age and they can get sports performance very early. From the age of 6 or 7 children can start sports training and the progress of results depends on the quality of training done at an early age. The physical effort made in swim training acts on the body by stimulating the cardio-respiratory system and blood circulation, thermoregulation and organ function in tissues and cells. The aim of this study was to obtain sports performance by streamlining the capacity for physical effort performed based on the development of motor qualities: endurance, speed and strength. Objectives. In the practical application made on students aged 10-11, we pursued the following objectives; identifying the most important and accessible ways and means to obtain valuable results for increasing the performance of athletes; knowledge in the efficiency of development methods of specific motor qualities, especially the muscular force of swimmers. Methods. The methods used in this study were: observation method, practical application, statistical method, graphical representation and data interpretation method. Results. The implementation of the stepped working method for the development of swimmers' strength during the practical application to the experimental group, confirmed the hypothesis and the superiority of this method compared to the training program carried out by the control group can be highlighted. Conclusions. In the development of juniors' strength, an important place is occupied by exercises with weights, even with high demands. It should be noted that the application of the most effective methods in strength training by lifting weights must have a prior foundation made built a correct combination of volume and intensity of effort and adequate recovery.

Key words: strength, training, stepped method,

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INTRODUCTION

In order to obtain outstanding sports performances in any of the sports branches, it is necessary to rationalize the entire training process, in accordance to the requirements established for each training stage (Bitang, 2009). Depending on the inclusion of means and methods in the training plan, the capacity of athletes in preparation for performance, material and financial resources available, the application of the most modern knowledge on the methodology of specific physical effort, performance can take different aspects and forms (Loveless et al., 2010). The studies undertaken and the experience of the coaches in obtaining the sports performances pulled the scientific research in the field of sports towards an applied scientific research, in which from many fields a transfer of knowledge from and to other sciences was made.

Many elements are involved in compiling a training plan, which includes special and general physical training, technical, tactical and psychological training (Dragnea et al., 2002). A system is created which is based on the scientific, methodological and organizational study appropriate to the training process and which will allow the correct combination of all types of training, in order to obtain maximum sports performance.

Physical training is a process that aims to develop basic physical qualities. Learning to swim is done from an early age and talented children will start continuous training on a scientific basis as early as possible but not before the age of 7-8 years.

"The assessment of swimming effort is made according to distance and time, to establish and assess the effort according to basic principles such as: specificity of effort, progressivity and overload, which also bring important changes in training preparation methodology" (Marinescu, 2003)

Specialists in the field recommend workouts with high volume of effort and also with high intensity (Ignat, 2006). For the young age categories, methodical means for training young swimmers were created and made available to coaches by the Romanian Swimming Federation. Swimming includes several sports events, from 50 m swimming races to 1500 m events. For the performance of these races, athletes need to develop motor skills, such as endurance, strength, speed, coordination of movements and flexibility (Marinescu et al., 2010). They can be developed and improved both during training at the swimming pool and during training at the gym.

The most important physical qualities of a swimmer are speed and endurance, which are closely related to the development of strength.

The physical effort in the water is achieved by propulsion acting on the water through the movements of the lower limbs. The maximum muscle strength of these segments acts on the water and the more optimal the muscle fibers for the effort, the better the propulsion efficiency.

The development of muscle strength ensures balance of the body during the effort maximizing the movement through water with great precision and speed (Guyton, 1996).

Strength is the ability of an athlete to overcome external resistance or to resist through muscular effort.

It is known that swimming speed depends primarily on the distance traveled. At the root of the development of strength is power (McLeod, 2010). In competitions we can see quite often how, after the swimmer has started a distance with a good technique, he gradually shortens his race or slows down, which leads to a decrease in speed. If muscle group fatigue is combined with a relatively rapid recovery of heart rate through good functional training, this results in insufficient local strength.

To develop strength, training includes (Groza, 2015): general strength development exercises for the muscles of the neck, arms, torso, legs, jumping, throws, exercises with weights from the age of 11 years.

Physical training on land uses exercises that involve muscle groups (Ifrim, 1986) used in swimming and that mimic the movements in the water, with high amplitude, with a sustained work

rhythm, and sports equipment will be used predominantly from a lying position. Mobility and stretching exercises are very important in warming up and training (Gatta et al., 2012).

In swimming, the basic motor qualities, which determine the obtaining of sports performances, are manifested in a combined form and not too simple, a form determined by the specifics of the test and the respective procedure.

The initiation of some experimental training stages can highlight the superiority of some working methods in relation to the age of the athletes and to the training period. This would allow in the future the elimination of inefficient elements from physical training and better management of training time.

THE AIM OF THIS STUDY

The aim of this study is to increase the performance of junior swimmers by developing muscle strength that will improve and optimize the performance of swimmers in training and competitions.

The objectives pursued in the research are:

Application of some physical development programs, which aim mainly at the motor qualities of strength and power, in order to improve the sports performances;

Establishing the content and structure of the experimental program for physical training of swimmers;

Elaboration and introduction in the training plan of some special physical training programs in the training of swimmers;

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RESEARCH HYPOTHESIS

If the physical training occupies an important place in the training process, then the technical executions are not mastered correctly only in the conditions in which a solid physical support is achieved.

Thus, if we use for the development of strength in the process of stepwise increase of effort, we consider that we will obtain better values of strength indices than through other methodical procedures.

SUBJECTS AND PRACTICAL APPLICATION

The practical application was carried out on a number of 15 female swimmers in a group of the 4th grade at the Emil Racoviță National College, Bucharest.

Eight swimmers (the experiment group) of the 15 athletes perform strength training exercises in a six week step-by-step growth process.

The other group of seven athletes (the control group) use two programs for the same amount of time: power training and the circuit work method.

Swimmers performed a specific training 3 times a week (Monday, Wednesday and Friday).

The training program for the development of general strength includes the following exercises: bicep flexions, throws with the medicine ball (2 kg), knee bends, vertical brace, half-bends, dumbbell lifts, pushed lying down, horizontal brace and exercises for the abdomen at an inclined plane.

The tests to which the swimmers were subjected to verification were:

Test 1. - Speed running with standing start on the distance of 30 m (sec);

Test 2. - Vertical leap (cm)

Test 3. - Long jump without momentum on two legs (m);

Test 4. - Triple jump without momentum (m);

Test 5. - Overhead throws with two arms - medicine ball 2 kg.

Test 6. - Forward throws with two arms - medicine ball 2 kg;

Test 7. - Knee flexion - kg;

Test 8. - Pushed lying down - kg.

The methodical variant of step work used was done with two repetitions with the same load of 60% - 60%; 65% - 65%; 70% - 70%; 80% - 80%.

RESEARCH METHODS

The following methods were used for our research: the method of studying the specialized bibliography through which the theoretical substantiation will be performed, the observation method applied throughout the research activity, the experimental method or the practical application that will provide an objective basis to respond to the hypotheses and the statistical-mathematical method of data processing and interpretation (Gagea, 1999).

RESULTS

The experimental program for the development of swimmers' strength was applied for six weeks, three times a week and the testing through control tests was done before and after the experiment. For a better visibility and clarification of the results obtained, we recorded the data obtained and the averages of the experiment group and the control group.

Table 1 shows the averages of the test results of the experimental and control groups and the control group at the initial and final tests.

In Figure 1 are the averages of the two groups of results obtained in the initial test and final test. We see from the graph that the experimental group obtained better final results compared to the control group. It is highlighted in figure 2, particularly good results obtained from tests 2, 7 and 8.

Figure 3 shows the progress at the end of the differences between the two groups of tests. In these tests: 2 which represent vertical relaxation, 7 which represent knee flexion and 8 which represent the push-and-lie test, the experimental group made much more important progress compared to the control group. These data prove that the means used and the training plans during the practical application were good and in terms of working method it can be highlighted the superiority of the step work method.

Table 1 Average of the results at the initial test (IT) and the final test (FT) of the experimental group (EG) and of the control group WG)

<i>Control samples</i>	<i>Experiment group</i>		<i>Control group</i>		<i>Difference in progress</i>	
	<i>Initial testing</i>	<i>Final testing</i>	<i>Initial testing</i>	<i>Final testing</i>	<i>EG</i>	<i>WG</i>
Test 1. speed running with standing start on the distance of 30 m (sec);	5.82	5.50	5.85	5.74	0.32	0.11
Test 2. - vertical leap (cm)	26	31	25	26	5.0	1.0
Test 3. - long jump without momentum on two legs (m);	1.25	1.36	1.26	1.28	0.11	0.02
Test 4. - triple jump without momentum (m);	5.24	6.20	5.10	5.35	0.96	0.25

Test 5. - Overhead throws with two arms - medicine ball 2 kg/m.;	4.70	5.25	4.75	4.80	0.55	0.05
Test 6. - Forward throws with two arms - medicine ball 2 kg/m.;	3.70	4.60	3.65	3.72	0.90	0.07
Test 7. - knee flexion - kg;	27	41	28	32	14.0	4.0
Test 8. - Pushed lying down - kg.	25	35	25	30	10.0	5.0

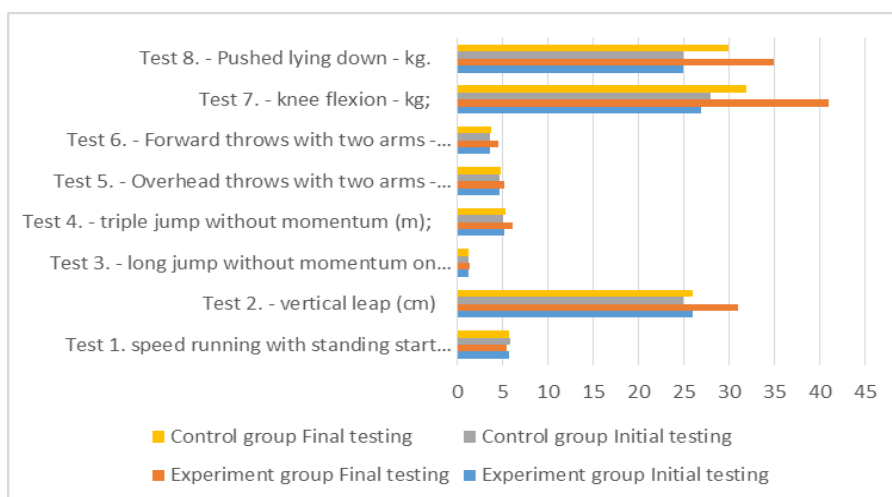


Figure 1 Average results of the control samples

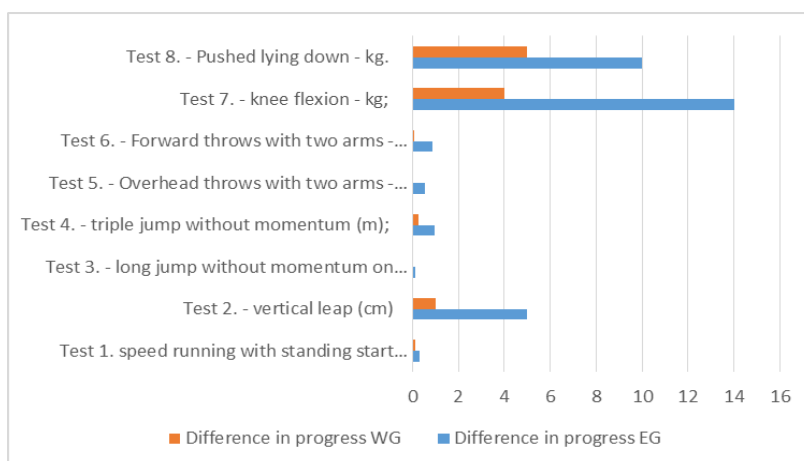


Figure 2 Progress of the groups between the two tests

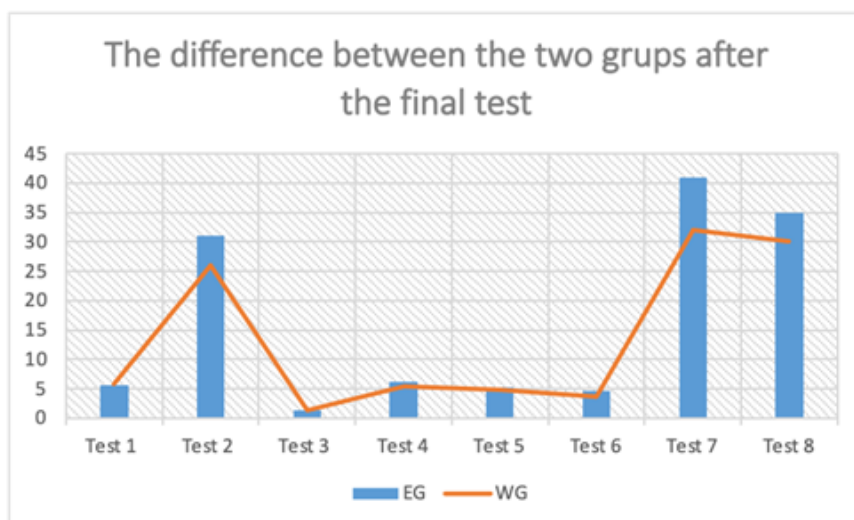


Figure 3 Differences in progress of the two groups

CONCLUSIONS

In the development of junior strength, an important place is occupied by exercises with weights, even with high demands. It should be noted that weight training should be based on a correct combination of effort volume and intensity and proper recovery.

The obtained results underline the importance of using strength training through the process of increasing weight in steps, which after six weeks of training had beneficial effects, in the sense of improving the muscular strength of swimmers and implicitly sports performance.

Athletes from both groups progressed but the most important developments were the swimmers from the experimental group who participated in the study.

Thus, the results obtained from the tests performed entitle us to conclude that the proposed hypothesis has been confirmed.

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