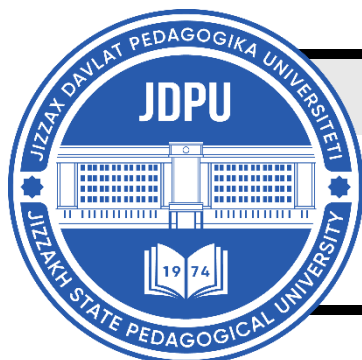


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METHODOLOGICAL JOURNAL<http://mentaljournal-jspu.uz/index.php/mesmj/index>EFFECTIVENESS OF UTILIZING CIRCULAR TRAINING
FEATURES FOR SWIMMERS IN SPORT-RECREATIONAL GROUPS**Shukhrat Pirnazarov**

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ABOUT ARTICLE

Key words: swimming, general physical training, circular training, exercise complexes, familiarization with the aquatic environment, children's sports, game method, speed, general speed.

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Abstract: The article presents material on the issues of general physical training of swimmers at the sports and recreation group stages. The results of a pedagogical experiment on the approbation of the developed complexes of general physical training with elements of circular training are presented. In the course of the research, two complexes have been developed, which are used alternately. The first complex includes exercises for the development of explosive strength and speed, and the second complex contains exercises for the development of flexibility and strength endurance. The method of using the complexes involves a gradual complication and alternation of exercises. The duration of one complex is 15 minutes. Experimental testing of the developed complexes has shown their effectiveness. A significant increase in the indicators of strength training, flexibility and speed of swimmers aged 8-11 years was revealed. Additionally, as a result of the survey of those involved, a high subjective assessment of the developed complexes was revealed.

INTRODUCTION

Modern swimming continues the search for effective means and methods of training. Circuit training has been proven to be an efficient form of enhancing the level of physical

fitness within the athlete training system. However, careful consideration should be given to this method, including attention to age restrictions. At the initial stage of preparation, it is essential to ensure the harmonious development of the physical attributes of young swimmers. This necessitates a more detailed study of the specific features of using circuit training in the physical education of swimmers aged 8–11. To develop flexibility and strength endurance, the general physical training complex consists of 20 exercises, but only 9 exercises were used in each specific lesson. The selection of these 9 exercises is determined by the ability to perform the complex exercises optimally at the right time. This complex is planned to be performed at the edge of the pool during general developmental exercises on land, with swimmers later performing exercises in the water. For this, more than 15 minutes is required. The two developed exercise complexes provide for the harmonious development of swimmers, incorporating exercises designed to develop various physical qualities: flexibility, speed, explosive strength, and strength endurance. The large variety of different exercises in the complex, their complexity, and the introduction of new elements help improve swimmers' coordination skills.

MATERIALS AND METHODS

This research aims to develop and substantiate circuit-based training programs to improve the general physical fitness of swimmers aged 8–11. The objectives include:

1. Summarizing and systematizing information about the use of circuit exercises in the general physical fitness training of swimmers aged 8–11.
2. Determining the level of general physical fitness of swimmers aged 8–11.
3. Developing and experimentally testing structured training programs for swimmers aged 8–11. To study the characteristics of using circuit training in the general physical fitness process for swimmers, the following methods were used: Analysis and synthesis of scientific and methodological literature; Pedagogical tests; Pedagogical experiments; Questionnaires; Methods of mathematical statistics.

RESULTS AND DISCUSSION

The study involved swimmers from School No. 2 of the M. Ulugbek District Sports Academy. Experimental and control groups were formed, each comprising 16 boys in their first year of training.

During the process of identifying the level of general physical fitness among swimmers aged 8–11, pedagogical testing was conducted. The average test results for swimmers in this age group at the initial stage of the study are presented in Table 1.

Table 1**Physical Fitness Test Results for Male Swimmers Aged 8–11**

Nº	Indicators	Mean Value ($\bar{X} \pm s$)	Rating in Points	Physical Fitness Level
1	Hand strength (kg)	11,5 + 1,3 2,9 + 0,8	11,5 + 1,3 2,9 + 0,8	Low
2	Explosive Strength (Vertical Jump), cm	24,7 + 4,8 3,3 + 0,9	24,7 + 4,8 3,3 + 0,9	Low
3	Shoulder Joint Mobility (Rotation), cm	36,9 + 11,3 4,8 + 0,4	36,9 + 11,3 4,8 + 0,4	High
4	Spinal Mobility (Flexion), cm	6,8+ 6,2 4,0+1,2	6,8+ 6,2 4,0+1,2	Average
5	Hand Motion Frequency (Number of Rotations in 10 Seconds)	34 + 5 4,0 + 1,0	34 + 5 4,0 + 1,0	Average

Analysis of the results indicates that the average hand strength among 8–11-year-old swimmers was 11.5 kg, with an average score of 2.9 points. This corresponds to a low level of physical fitness. Explosive strength was assessed based on vertical jump results. The group's average result was 24.7 cm, with an average score of 3.3 points. According to the evaluation tables, this result also corresponds to a low level of overall physical fitness.

The mobility of shoulder joints was assessed using the “rotation” test, with an average result of 36.9 cm, corresponding to an average score of 4.8 points. This indicates a high level of physical fitness among 8–11-year-old swimmers. This result can be explained by the fact that the “rotation” test is a standard measure in experiments, and the coach places significant emphasis on this exercise.

Spinal mobility was assessed using the standard “flexibility” test. The group's average result was 6.8 cm, with an average score of 4.0 points, which corresponds to an average level of general physical fitness among the swimmers.

Movement frequency represents one of the elementary forms of speed. This quality was assessed using the forward “mill” exercise, during which swimmers performed the maximum number of rotations within 10 seconds. The group's average result was 34 rotations, corresponding to an average score of 4.0 points. This too reflects an average level of physical fitness.

In the next stage of the study, circular training complexes were developed for the overall physical fitness of 8–11-year-old swimmers. As a result, two exercise complexes with circular training elements were designed.

The first complex for general physical fitness focuses on developing explosive strength and speed. It includes 21 exercises, some of which have variations in difficulty, while others can be substituted.

For instance, this complex includes the following: maximum-frequency arm and wrist rotations, circular arm movements in opposite directions, exercises with weighted balls, jumps, hill sprints, hanging runs on a horizontal bar, and ball-handling exercises, among others. From the 21 exercises in the complex, nine are selected for each specific training session.

The second complex for general physical fitness consists of exercises aimed at developing flexibility and strength endurance. This includes forward bends for spinal stretching, various bending exercises, arm rotations, seated dryland breaststroke motions, and similar exercises using the dolphin technique. To develop strength endurance, the complex incorporates planks with multiple variations, as well as exercises like the “wheelbarrow” and “crab,” among others.

In organizing the training, the exercise complex is structured so that some exercises are performed by the whole group at the same time, integrating “circuit training” elements. Swimmers simultaneously perform the initial five exercises, and exercises six through nine are carried out in a circuit-training format, i.e., “in series.”

During the general physical training process of the swimmers, an experimental pedagogical practice was organized to test the exercise complexes with circuit training elements. It lasted two months, including 32 lessons. Follow-up tests were conducted to determine improvements in efficiency. These tests helped identify the dynamics of strength readiness, flexibility, and speed indicators (Table 2).

Using hand dynamometer measurements, overall strength performance was determined. Prior to the experiment, hand dynamometer results were 11.5 kg, and after completing the recommended complexes, they improved to 14.5 kg. Statistical processing of the results showed significant positive changes ($P < 0.001$). This improvement in hand strength is related to the execution of several strength-targeted exercises, which contributed to the enhancement of overall strength conditioning for the 8-11-year-old swimmers.

The results of the vertical jump test, which reflects the explosive power of the swimmers, showed an initial result of 24.7 cm. After the experiment, the result significantly improved to 29.9 cm ($P_0 < 0.001$). This positive effect is connected to the inclusion of speed-strength exercises in the complex, which improved the explosive power of the 8-11-year-old swimmers.

Table 2

The results of the pedagogical experiment before and after the use of general physical fitness complexes with circuit training elements for the swimmers' overall physical conditioning.

Nº	Indicators	Mean Value ($X_1 \pm S_1$)	Rating in Points $X_2 \pm s_2$	P ₀
1	Hand strength (kg)	11,5 + 1,3 14,5 + 1,1	11,5 + 1,3 14,5 + 1,1	<0,001
2	Explosive Strength (Vertical Jump), cm	24,7 + 4,8 29,9 + 3,7	24,7 + 4,8 29,9 + 3,7	<0,001
3	Shoulder Joint Mobility (Rotation), cm	36,9 + 11,3 34,3 + 10,3	36,9 + 11,3 34,3 + 10,3	<0,001
4	Spinal Mobility (Flexion), cm	6,8+ 6,2 9,9+ 4,3	6,8+ 6,2 9,9+ 4,3	<0,001
5	Hand Motion Frequency (Number of Rotations in 10 Seconds)	34 + 5 39 + 4	34 + 5 39 + 4	<0,001

In addition to strength exercises, the complexes include many exercises that help develop the flexibility of the swimmers. The analysis of the results showed that the mobility of the shoulder joints, measured using the "rotation" test, improved in the 8-11-year-old swimmers who underwent the developed complexes. Before the experiment, the rotation test results were 36.9 cm, and after performing the recommended complexes, they improved to 34.3 cm. Statistical processing of the results showed that the positive changes were significant ($P_0 < 0.001$).

The second test, used to assess the swimmers' flexibility, involved performing forward bending exercises to measure spinal mobility. The analysis of the results showed that the swimmers' performance in the "bend" exercise, designed to improve spinal mobility, significantly improved during the use of the exercise complexes. Before the experiment, the swimmers in the experimental group had a result of 6.8 cm, and after using the complexes developed with circuit training elements, their results improved to 9.9 cm. The differences were statistically significant ($P_0 < 0.001$), indicating the positive impact of the developed complexes.

The analysis of the results of the test aimed at evaluating the frequency of arm movements also showed an improvement in this indicator among the swimmers. This test reflects a physical quality, such as speed. The exercise complex includes exercises that help improve this quality. Performing arm movement imitations, rotations at the elbow and shoulder joints, and other various exercises at high speeds contributed to positive changes. Before the experiment, the group of swimmers had an average movement frequency of 35

arm rotations, and after the experiment, the result improved to 39 rotations in 10 seconds. Statistical processing of the results indicated that the positive changes were significant ($P_0 < 0.001$).

Thus, the developed complexes had a positive effect on the swimmers' physical fitness. The swimmers significantly improved their results in all the tests, which suggests that these exercises should be integrated into the future training process to further improve these indicators. This also indicates the wise selection of exercises within the complexes.

Table 3

Evaluation of exercises, equipment, and the impact of new comprehensive exercise sets during pedagogical trials based on participant surveys.

Assessed Components	1 "Very Poor"	2 "Poor"	3 "Better"	4 "Good"	5 "Excellent"	Average
	Survey participants' answers count and percentage					
Complex with exercise elements in the scheme	-	-	-	2 (12%)	14 (88%)	4.9
General development exercises on land	-	-	4 (25%)	3 (19%)	9 (56%)	3.8
Did you like the exercises?	-	-	-	2 (12%)	14 (88%)	4.9
Did you like the equipment (fitballs, balls, gymnastic mats)?	-	-	-	2 (12%)	14 (88%)	4.9
Was performing the complex exercises interesting?	-	-	-	1 (6%)	15 (94%)	4.9
Was the complex exercise useful to you?	-	-	-	1 (6%)	15 (94%)	4.9

In the survey, young swimmers were asked to respond regarding what they liked about performing a set of exercises with circuit training elements. Before the experiment, the average subjective rating of the usual warm-up exercises performed by the swimmers was 3.8 points. After completing the developed set of exercises, the participants gave the new exercises a higher rating — the average rating was 4.9 points. Therefore, the set of circuit exercises, which added variety to the training process, was well-received by the participants.

The participants rated the exercises, equipment, and benefits of the exercises highly and indicated high interest in the training. When asked, "Did you like the exercises?" 88% of the participants answered "Definitely yes" which corresponds to 5 points, and only 12% (2

participants) answered "Yes" which corresponds to 4 points. This indicates that the circuit exercises were liked by the participants.

When asked, "Did you like the equipment?" 88% of the participants answered "Definitely yes" which corresponds to 5 points, and 12% answered "Yes" which corresponds to 4 points. The children approached the execution of the developed complex with interest, as it was new for them to switch from one exercise to another, use equipment, and complete tasks within a limited time using a stopwatch.

The next question asked the participants about their interest in completing the set. 94% answered "Definitely yes" (5 points), and 6% answered "Yes" (4 points). Evaluating the advantages of the exercises, the swimmers rated the complex exercises highly. 94% gave a rating of 5 points, and 6% gave a rating of 4 points.

CONCLUSION

The proposed complexes and participation in the pedagogical experiment not only helped diversify the training process but also provided swimmers with an opportunity to test their abilities when performing the exercises. During the training, the participants first performed the exercises in small groups. Although it was uncommon to split into smaller groups in the first class and some organizational difficulties were observed, they emphasized that they enjoyed doing the exercises. Thus, the developed set of exercises, tested in the experimental trial, proved to be effective, as it significantly improved the physical readiness, flexibility, and speed indicators of 8-11-year-old swimmers. Based on the survey conducted after the pedagogical experience, the swimmers' average score of 4.9 points is considered a strong positive impact reflecting the high level of interest.

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