Enhancing the speed and power of 14-17-year-old scuba divers through circular training

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Associate Professor **E.V. Redi**
PhD, Associate Professor **E.N. Konopleva**
E.D. Popova
Reshetnev Siberian State University of Science and Technology, Krasnoyarsk

Corresponding author: Russlen90@mail.ru

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Abstract

Objective of the study was to assess the extent of development of speed and strength in scuba divers aged 14 to 17, employing the circular training approach.

Methods and structure of the study. The research encompassed a cohort of young divers, aged between 14 and 17, who were divided into two groups: a control group and an experimental group, each consisting of 15 participants.

Results and conclusions. A contrast of the outcomes of the trials conducted on the experimental and control groups for the exercises under investigation reveals that in terms of speed and power, the experimental group demonstrated a substantial advantage over the control group. Additionally, the athletes in the experimental group achieved superior results at the conclusion of the athletic season in the sprint distances of 50 and 100 meters in flippers, compared to the athletes in the control group. This demonstrates the efficacy of the experimental program in enhancing speed and power abilities.

Keywords: *underwater swimmers, contests, circuit workouts, swiftness, physical prowess, power, athletic endurance.*

Introduction. Modern sports place increased demands on the physical fitness of athletes and underwater sports are no exception [1,2]. An important role is given to speed-strength training, which is understood as a set of means and methods for the comprehensive development of speed and strength in order to ensure comprehensive harmonious physical development, achieving the required level of special training of an athlete and, on this basis, achieving high sports results. Insufficient speed-strength qualities of athletes limits the effectiveness of performance in competitions. The absence of special speed-strength training in the training process of underwater swimmers in the proper volume leads to a decrease in the growth of functional qualities, and targeted work on the development of speed-strength qualities contributes to a uniform increase in the indicators characterizing this quality from age to age. Recently, when conducting classes, coaches have been using the circuit training method, which provides a comprehensive effect on various muscle groups. Circuit training, as an integral form of physical training, teaches students to think independently when developing motor skills, develops an algorithm of pre-planned motor actions, and fosters composure and organization when performing exercises [3].

Objective of the study was to assess the extent of development of speed and strength in scuba divers aged 14 to 17, employing the circular training approach.

Methods and structure of the study. The study involved juniors, underwater athletes aged 14 to 17 years (30 people), divided into experimental (A) and control (B) groups of 15 people each. During the sports season, the athletes of group A used the method of circuit training on land, which involves performing several exercises in a circle in a certain period of time with minimal rest. Various exercises for different muscle

Table 1. Average results of athletes from experimental group A and control group B at 50 and 100 meter finswimming distances

N of the test athlete (group A)	50 meters swimming with fins (group A)	100 meters swimming with fins (group A)	N of the test athlete (group B)	50 meters swimming with fins (group B)	100 meters swimming with fins (group B)
Girls	20,8	44,0	girls	22.0	49.2
Young men	19,5	40,2	young men	21.5	42,4

groups were selected for training (squats, push-ups, jumps, pull-ups, planks, etc.). Each exercise was performed for a certain time (for example, 30 seconds) or a certain number of times (for example, 10-15 times). The exercises were performed alternately - after completing one exercise, they immediately began another without a break.

Athletes of group B trained according to the traditional program. The following methods were used in the work: the method of assessing time indicators, the method of mathematical statistics. To assess the time indicators, the athletes studied were given the results shown during the season at distances of 50 meters swimming with fins and 100 meters swimming with fins.

Results of the study and discussion. Sports training is an important stage in preparing athletes for competitions. Speed-strength training is a set of means and methods for the comprehensive development of speed and strength in order to ensure comprehensive harmonious physical development, achieving the required level of special training of an athlete and, on this basis, achieving high results. In this work, the basis of speed-strength training will be various exercises. Only with a competent structure of the training process is it possible to show high sports results in competitions. In this study, we examined the best results in the season of athletes of group A and group B at distances of 50 and 100 meters swimming with fins. The results of the athletes are presented in Table 1.

Analyzing the results of the athletes in Table 1, we can say the following: athletes of group A have faster results in sprint distances of 50 and 100 meters than athletes of group B, both among girls and boys.

In order to determine the effectiveness of circuit training on land for the development of speed-strength abilities, athletes of group A and group B passed control standards on land. The results of the athletes are presented in Table 2.

Analyzing the results of passing the control standards of athletes in Table 2, we can say the following: athletes of the experimental group A, who used the circuit training method on land for a year, have better results than athletes of the control group B, both among girls and boys.

In order to determine to what extent underwater athletes need to use the circuit training method when training on land, we conducted a correlation analysis of the relationship between the sports result (the best result of the season at a distance of 50 and 100 meters) and the results of passing the control standards on land.

Analyzing the obtained results, we made the following conclusion: girls have a strong degree of dependence of the sports result at 50 and 100 meters (r = 0,83, r = 0,81) with the results of passing the control standards on land. Young men also have a strong relationship between the sports result at 50 and 100 meters (r = 0,85, r = 0,82) with the results of passing the control standards on land.

Conclusions. Comparison of the test results of the experimental and control groups for the tested exercises, presented in Table 2, shows that in speed-strength exercises the experimental group significantly surpassed the control group. Also, the athletes of the experimental group have higher results at the end of the sports season at sprint distances of 50 and 100 meters swimming with fins than the athletes of the con-

Table 2. Average results of passing control standards on land for athletes of experimental group A/control group B

Control standard on land / Athlete (group A/group B)	Jumping onto a bench from a full squat (in 20 seconds)	Shuttle run (4 x10 meters)	Bench jumps (20 seconds)	Squat push-up, lying push-up, squat push-up with jump (in 20 seconds)	Simultaneous lifting of straight legs and torso (for 20 seconds)
Girls	15/12	8,5/9,2	17/15	14/12	16/14
Young men	16/14	7,2/8,0	17/15	16/14	18/16

trol group. This indicates a greater effectiveness of the experimental program for the development of speed-strength qualities than the program that was used in the control group. The conducted correlation analysis of the relationship between the sports result (the best result in the season at a distance of 50 and 100 meters) and the results of passing the control standards on land showed a strong degree of dependence. This suggests that the use of the circuit training method on land in the preparation of 14-17 year old underwater swimmers has proven its effectiveness and can be recommended for wide use in practical work.

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