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## Breath holding skill formation among young synchronized swimmers

Yuliya A. Postolnik<sup>1\*</sup>, Elizaveta S. Kumantsova<sup>2</sup>, Elena Yu. Ivlieva<sup>3</sup>, Natalya S. Kuptsova<sup>1</sup>

<sup>1</sup>Moscow City Pedagogical University  
Moscow, Russia

ORCID: 0000-0003-4053-2784, postolnik.julia@yandex.ru\*

ORCID: 0000-0002-5177-751X, e-mail: Zavtt@mail.ru

<sup>2</sup>Moscow State Technical University of Civil Aviation  
Moscow, Russia

ORCID: 0000-0003-0619-7986

<sup>3</sup>Russian State University of Justice  
Moscow, Russia

ORCID: 0009-0004-9671-1030, KupcovaNS1@mgpu.ru

**Abstract:** The article presents a brief history of synchronized swimming. In this aesthetic and spectacular sport Russian athletes are among the leaders, confirm their priority at the largest international competitions. Maintaining high positions in this sport requires high-quality of sports reserve training. However, the analysis of personal data of coaches, who train synchronized swimmers-beginners, showed that the training lessons held according to long-term tradition, were conservative enough and include only general swimming readiness, thorough learning of special elements. Since the representatives of synchronized swimming perform a significant part of the exercises holding breath, the development of general, special and strength endurance among girls is especially importance. The students, who trained according to the experimental technology, which was directed toward the skill of breath holding formation, had significant advantage over the representatives of the control group according to all indices of functional, technical and swimming fitness in the end of the experiment. **Materials.** This article presents the data of effective work on the use of the exercises and complexes aimed at the skill of breath holding formation among young female synchronized swimmers. They positively influenced functional, technical and swimming fitness. **Research methods:** analysis of information sources corresponding with the research topic; pedagogical observation; pedagogical experiment; methods of mathematical statistics. **Scientific novelty.** 1. the exercises determination for the physical quality of endurance development and methods of its assessment in the group of initial training in synchronized swimming for 9-10 year-old girls; 2. the content of classes in the gym and on water is created and experimentally substantiated. The content is directed toward the skill of inspiratory breath holding formation among young female synchronized swimmers; 3. we showed the effectiveness of the offered methodological project – the content of classes. It is directed toward the skill of inspiratory breath holding formation. The practical significance of the work is in the content of classes creation, directed toward the skill of breath holding formation among young 9-10 year-old synchronized swimmers with the emphasis on general and special endurance development, teaching specific for this kind of sport skill of the exercises fulfillment in the regimen of arrhythmic breathing and held breath. The results of the study were introduced into the educational and training process of the sports school of the Olympic reserve of female athletes of junior and sports categories. **Results.** The analogy of the obtained results of functional, technical and swimming fitness in the control and experimental groups is confirmed by all indices increase among the respondents of the experimental group over the control group. The introduction of exercises and methods directed toward general and special endurance development into a long-term training process of young 9-10-year-old synchronized swimmers allowed to improve the quality of functional, technical, and swimming fitness of athletes. **Conclusion.** An innovative approach to the skill of breath-holding formation among young 9-10-year-old female synchronized swimmers, was in the need for general physical and special fitness improvement, the introduction of hypoxic training into the training process, both on land – in the gym and in the water. It resulted in functional, technical and swimming fitness indices increase among young female synchronized swimmers.

**Keywords:** young female athletes, synchronized swimming, functional fitness, breath holding, endurance.

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### **Introduction**

Synchronized swimming in 1956 became one of water kinds of sport, combined by the International Swimming Federation. In 1984 in Los Angeles synchronized swimmers for the first time were awarded by the Olympic medals and 16 years later in 2000 all “gold” of the XXVII Olympic Games in Sydney was won by Russian synchronized swimmers. In this aesthetic and spectacular sport Russian athletes are among the leaders, confirm their priority at the largest international competitions more than 20 years [3, 8, 6]. Maintaining high positions in this sport requires high-quality of sports reserve training [7]. However, the analysis of personal data of coaches, who train synchronized swimmers-beginners, showed that the training lessons held according to long-term tradition, were conservative enough and include only general swimming readiness, thorough learning of special elements, exercises, complexes, combinations and exercises for flexibility and choreography. Moreover, during the process of general and physical training among 9-10 year-old girls, not sufficient attention is paid to strength oriented qualities, endurance, dexterity development. At the same time, the specialists in synchronized swimming don't reject these qualities significance for the lessons with young synchronized swimmers.

Since the representatives of synchronized swimming perform a significant part of the exercises holding breath, the development of general, special and strength endurance among girls is especially importance. Strength endurance- strength component of special endurance is the ability of an organism to resist tiredness during the work of submaximal power and duration till 3-4 minutes, fulfilled owing to anaerobic-glycolytic energy supply [1]. During one performance in voluntary program – duet, which lasts 2 minutes 30 seconds, 12 year-old (and younger) female athletes have to fulfill the exercises holding breath during 1 minute  $\pm$  10 seconds. It is provided owing to voluntary regulation of respiration. However, among 7-9 year-old children this mechanism of regulation is not developed enough and endurance indices are not significant [5].

Before the presented research we set the following objectives:

1. to define available means of physical quality of endurance development and the methods in the group of initial training in synchronized swimming among 9-10 year-old girls;

2. to create the content of the lessons in the gym and on water, which are directed toward the skill of inspiratory breath holding formation among 9-10 year-old girls- synchronized swimmers;

3. to show the effectiveness of the offered methodical project, which is directed toward the skill of inspiratory breath holding formation among 9-10 year-old girls- synchronized swimmers.

### **Materials and methods**

At the beginning of the experiment, which was carried out during 1,5 years on the basis of swimming-pool “School of water sports of Moscow City Pedagogical University (MCPU)” at sports school of the Olympic reserve for children in Moscow, by means of random sampling we formed the experimental and control groups, each group included 10 girls. They didn't have valid differences according to the level of swimming readiness and endurance development indices. In both groups the training lessons were held with 9-10 year-old girls athletes 5 times a week (each lesson 2 hours 15 minutes): 1 hour 30 minutes on water and 45 minutes in a gym. The base of each lesson was a purposeful development of endurance, the skill of inspiratory breath holding formation.

Fundamental orientation of the training lessons in the gym was the following: Monday and Wednesday – choreography, sport dancing, stretching; Tuesday, Thursday and Saturday – cross training, outdoor games, exercises for flexibility and power development with own weight overcoming, complexes on the training simulators. Almost quarter of all exercises were fulfilled with the regulated rhythm, respiration frequency and depth and during inspiratory breath holding, in accordance with the principles of hypoxic training. Pulse helped to control how the athletes reacted to the loads. Exercises dosing was realized according to generally adopted methodologies of endurance, strength and strength endurance development. The base of the lessons formed circular method of training.

The specificity of the lessons in water is exercises for breath holding inclusion – summarily 30 minutes. The exercises were fulfilled with the stress on the quality, duration of being under water, tempo; the exercises were held in a form of a competition. Volumetric swimming till 1000 meters, swimming with breathing regulation according to the cycles, while breath holding, speed inspiratory breath holding swimming. Distant diving, serial fulfillment

of special elements and figures while breath holding, alternating with rhythmic exhalations into water, mastering the main obligatory figures with technique and time of breath holding estimation form the base of training in water.

### Results and discussion

In the end of the experiment we estimated the

quality of endurance development among the girls from the experimental and control group, where the classes were held according to the program and methodical recommendations of sports school of the Olympic reserve of Moscow. At the beginning we revealed no valid differences in mentioned below indices of endurance development between the groups.

Table

Average indices of the young 9-10-year-old female athletes' functional readiness from the EG and CG in the end of the experiment

Index	EG n=10	CG n=10	P
	X ± σ	X ± σ	
Vital capacity (VC)/ml	2310 ± 179,2	2130 ± 176,7	<0,05
Birth-death ratio / ml/kg	91,2 ± 4,2	87,9 ± 2,5	<0,05
Stange's test /sec.	44,13 ± 3,8	35,87 ± 4,9	<0,001
Genche test /sec.	19,46 ± 1,6	16,45 ± 1,2	<0,001

The table shows that the girls from the experimental group had the advantage over the girls from the control group in VC index (P=0,05) 2310±179,2 ml and 2130±176,7 ml; the average index for 11 year-old swimmers (according to the results presented by N.Zh. Bulgakova and A.R. Vorontsov, 1996) is 2850 ml. Vital capacity of young swimmers, [according to the data of the same authors] is 69,8 ml/kg, the average index in the experimental group of synchronized swimmers is 91,2 ml/kg ±4,2, in the control group 87,9 ml/kg ±2,5 in terms of p=0,05. The girls from the experimental group also had valid (p=0,001) advantage over the girls from the control group according to the indices of oxygen deficiency resistance: time of inspiratory breath holding / sec. in the EG - 44,13±3,8 in the CG - 31,87±4,9; expiratory breath holding in the EG -19,46 sec. ±1,6 and the CG - 16,45 sec. ±1,2; age-related indices of inspiratory breath holding for 11year-old girls 38,4 [2].

The attempts to reveal valid differences according to the length of surface dive were not successful, as in our opinion, the athletes used different ways of movement under water. They provide different speed of distance overcoming.

In the middle and the end of the experiment we organized qualification competitions. The athletes of both groups took part in these competitions. 5 arbitrators judged the competition. They estimated the figures of the obligatory program according to 10-points system; maximal and minimal points were thrown aside. Out of the rest points referees put mean value, which was multiplied by the coefficient of the definite figure difficulty, each figure mark was summarized [4]. As a result, the first ten places were given in the following way: I – VI places and VIII

place took the representatives of the experimental group, VII, IX and X place took the girls from the control group.

The introduction into the training process of young 9-10-year-old synchronized swimmers the exercises and methods, directed toward general and special endurance development, teaching specific for this kind of sport skill of the exercises fulfillment in the regimen of arrhythmic breathing and held breath, helped to increase the quality of the functional and technical, swimming readiness of female athletes of junior and senior degrees.

### Conclusion

An innovative approach to the skill of breath-holding formation among young 9-10-year-old female synchronized swimmers was in the need for general physical and special fitness improvement, the introduction of hypoxic training into the training process, both on land – in the gym and in the water, which resulted in functional, technical and swimming fitness indices increase among young female synchronized swimmers.

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**Author's information:**

**Yuliya A. Postolnik** – Candidate of Pedagogics, Associate Professor, Moscow City Pedagogical University, 129226, Russia, Moscow, the 2nd 2- Selskokhozyaistvenny pass., House 4, e-mail: [postolnik.julia@yandex.ru](mailto:postolnik.julia@yandex.ru)

**Elizaveta S. Kumantsova** – Senior Lecturer, Moscow State Technical University of Civil Aviation, 125993, Russia, Moscow, Kronshtadtsky Boulevard, House 20, e-mail: [Zavtt@mail.ru](mailto:Zavtt@mail.ru)

**Elena Yu. Ivlieva** – Senior Lecturer, Russian State University of Justice, 117418, Russia, Moscow, Novocheremushkinskaya str., House 69

**Natalya S. Kuptsova** – Assistant, Moscow City Pedagogical University, 129226, Russia, Moscow, the 2nd 2- Selskokhozyaistvenny pass., House 4, e-mail: [KupcovaNS1@mgpu.ru](mailto:KupcovaNS1@mgpu.ru)