Dynamics of Physical Development of Young Girls of Synchronous Swimming in the Process of Educational Training

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Abstract. *In this article, the dynamics of the development of indicators of physical development of young athletes specializing in synchronized swimming and students at the stage of primary specialization in training groups of children's and youth sports school (Almaty) of Almaty city of the Republic of Kazakhstan is considered. The study period took place at the beginning and in the middle of the academic year. Traditionally, the beginning of the academic year in the Youth Sports School begins in September and ends in June, respectively, the studies were conducted in September 2017 and March 2018. In the experimental study, young synchronized female athletes took part, whose age was in accordance with the international FINA Rules 2017-2021, belong to the category of 12 years and younger.*

Keywords: synchronous swimming, sport reserve, training process, anthropometry, dynamometry, vital capacity of lungs, pulseometry, heart rate (HR), blood pressure (BP).

Introduction

Against the backdrop of the extensive development of sport, the appearance of female specializations in traditionally male sports - judo, marathon, water polo - synchronous swimming is difficult to call a new species, but it still remains so for sports science[1]. In the early stages of training the sports reserve, the training system is based on ensuring the comprehensive and full physical development of children and adolescents[2].

Outstanding scientists in the field of the theory of youth sports M.Ya. Nabatnikova and V.P. Filin[3] was invited to divide the process of long-term preparation into four stages with application of age divisions for each stage. For each age period of development, anthropometric data and corresponding biochemical processes characteristic of this period exist, which in turn affect the functional characteristics. Control over the level of biological maturity, knowledge of the tendency of development of organs and systems, their adaptive reactions to physical loads, allow to level errors in the normalization of physical loads during long-term work with young athletes[4].

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[1] T. Botagariev, S. Kubieva, N. Mambetov. G. Zherkechbaeva, Z. Suleimenova, Y. Zhetimekov, A. Gabdullin, Zh. Azamatova, "Determining Factors and Ways to Improve Physical Education for the First and Second Year Female Students", in *Astra Salvensis,* VI (2018), no. 11, p. 517-530.

[2] I. Smanov, A. Boranbayeva, K. Berkimbayev, K. Arymbayeva, K. Azhibekov, "Approaches to Online Learning: a Study of the Factors affecting Teachers in a Fully Online Faculty," in *Astra Salvensis,* VI (2018), no. 11, p. 631-640.

[3] M. Ya. Nabatnikova, *Construction of the process of sports training* Moscow, SAAM, 1995, p. 351-389.

[4] O. Budzinskaya, "Competitiveness of Russian Education in the World Educational Environment," in *Astra Salvensis,* VI (2018), no. 11, p. 517-530.

Material & methods

Goal of the work is presenting the dynamics of development of indicators of physical development of young athletes engaged in training groups for synchronized swimming in children and youth sports schools of the Republic of Kazakhstan[5].

Organization and methods of research is ordering to significantly improve the efficiency of synchronization training at the stage of primary specialization in training groups, the age category of which belongs to the first group is the athletes 12 years and younger, we analyzed the dynamics of development of participants' physical development indicators at the beginning and end of the academic year[6].

To represent the dynamics of development of indicators of physical development of female athletes in the training groups for synchronized swimming of the Republic of Kazakhstan, relevant studies were conducted. In the process of the delivered research experiment, the evaluation of the functional state of the organism of young athletes was studied.

An experimental study to determine the dynamics of indicators of the physical development of the participants in the experiment was carried out at the beginning and middle of the academic year. The experiment was conducted on the basis of the Republican State Treasury Enterprise (RSCC) "Center for Sports Medicine and Rehabilitation" in Almaty, Republic of Kazakhstan. The number of participants in the experiment was twenty people.

To solve the tasks in the course of our research, methods were used that adequately reflected the problem in question: analysis and generalization of data from special scientific and methodological literature on the research problem[7], anthropometric studies, medical and biological measurements [8].

Anthropometric studies were conducted to determine the physical development of young synchronystics in the NP and UTG groups; they included the following indices: body length (height) -measurement with a rostomere. Examined, stood with her back to the stand of the growth meter before touching her heels, back and buttocks. The accuracy of the measurement was up to 0.5 cm. Body weight (weight) - was established by

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[5] V. Yu. Davydov *Morphofunctional and motor performance of children of 10-14 years of different constitutional types: Method, recommendations,* Volgograd, VGAFK, 2001.

[6] N. M. Maksimova, *The method of initial training in synchronized swimming: Methodological development for students of GCOLIFK (specialization synchronous swimming),* Moscow, GTSOLIFK, 1989.

[7] V. N. Platonov, *The system of training athletes in the Olympic sport. General theory and its practical applications: a textbook (for trainers).* K., Olimp. lit., 2016.

[8] A. V. Kozlov, *Technology of sports training in swimming: the preparation of the Olympic reserve in sport swimming: Textbook,* St. Petersburg, 2014.

weighing, studied in stripped form on a medical scales. The measurement accuracy was up to 0.05 kg. Vital capacity of the lungs (ZHEL) is a physiometric indicator that is necessary for assessing the functional state of the respiratory system.

Hand dynamometry. In our case, a child dynamometer with a maximum load of 50 kg was used for the measurement.

The medical-biological method of measurement included the following methods of physical examination: pulsometry - measurement of the frequency of cardiovascular contractions (HR). The measurement was carried out in the resting state of the subject under investigation, in the condition of the absence of the preceding physical stress. Blood pressure (BP) - the measurement was carried out according to a standard procedure with the MMT-3 tonometer and a phonendoscope (mmHg).

Results

Statistical processing of data obtained at the beginning of the academic year showed that the anthropometric data (length and body weight) were in children of three age groups engaged in synchronous swimming at the beginning of the year averaged 139.96 cm and 30.89 kg respectively, Table 1. The value of the vital capacity lungs, which is one of the important indicators of the physical development of athletes in synchronized swimming in all studied ranges between 1812.5-1975.0 ml. The heart rate (heart rate) in the three groups averaged 80.21-82.2 beats per minute. Figures of car dynamometry in three age groups amounted to - 10.6 / 10.25 - 12.1 / 13.7. All these data correspond to their age periods, and children of 11-12 years are slightly higher.

Table 1 - Indicators of physical development of participants at the beginning of the academic year

№	Age, years	Indicators	Data of the synchronicities under study (n = 20)
1	9-10	Body length, cm	139,96
		Weight, kg	30,89
		Vital quality of lungs (JEL), ml	1812,5
		Heart rate, bpm	80,21
		Dynamometry of the brush, kg	10,6/10,25
2	10-11	Body length, cm	148,83
		Weight, kg	33,57
		Vital quality of lungs (JEL), ml	1880
		Heart rate at rest, bpm	87,33

		Dynamometry of the brush, kg	10,9/12,6
3	11-12	Body length, cm	149,6
		Weight, kg	39,64
		Vital quality of lungs (JEL), ml	1975,0
		Heart rate at rest, bpm	85,36
		Dynamometry of the brush, kg	12,1/13,7

Table 2 shows the indicators of the physical development of the participants in the experiment in the middle of the academic year.

As can be seen, from Table 2 and Figures 1, 2, 3, the dynamics of participants' physical development in the middle of the academic year in the age group of 9-10 years shows that there is an insignificant increase in anthropometric data on average by length and body weight by 1.54 cm and 0.11 kg respectively; the vital capacity of the lungs (ZHEL) increased by 87.5 ml, the heart rate (HR) decreased by 185.5 beats / minute. According to dynamometry data, the increase was 0.6 / 0.7 kg. In the age group of 10-11 years no notable changes were observed. In the age group of 11-12 years, compared to other age groups, there is a noticeable increase in indicators of physical development of participants in the middle of the academic year. The increase in anthropometric data is 5.2 cm and 3.51 kg, respectively. This age period corresponds to the stretching period. There is a marked increase in the value of the vital capacity of the lungs (JEL) - by 475 ml. At the same time, the value of pulseometry (HR) as the work of the cardiovascular system progressed decreased by 6.51 beats / min. There is a slight increase in the strength of the hand - by 0.5 kg and a noticeable increase in the index of the machine dynamometry - by 2.9 kg.

Table 2 - Indicators of the physical development of participants in the middle of the academic year

№	Age, years	Indicators	Data of the synchronicities under study (n = 20)
1	9-10	Body length, cm	141,5
		Weight, kg	31,0
		Vital quality of lungs (JEL), ml	1998,0
		Heart rate, bpm	78,5
		Dynamometry (fps), kg	11,2/10,95
2	10-11	Body length, cm	149,95

		Weight, kg	35,86
		Vital quality of lungs (JEL), ml	2115
		Heart rate at rest, bpm	77,8
		Dynamometry of the brush, kg	11,8/12,2
3	11-12	Body length, cm	154,8
		Weight, kg	43,15
		Vital quality of lungs (JEL), ml	2450
		Heart rate at rest, bpm	78,85
		Dynamometry (fps), kg	12,6/16,6

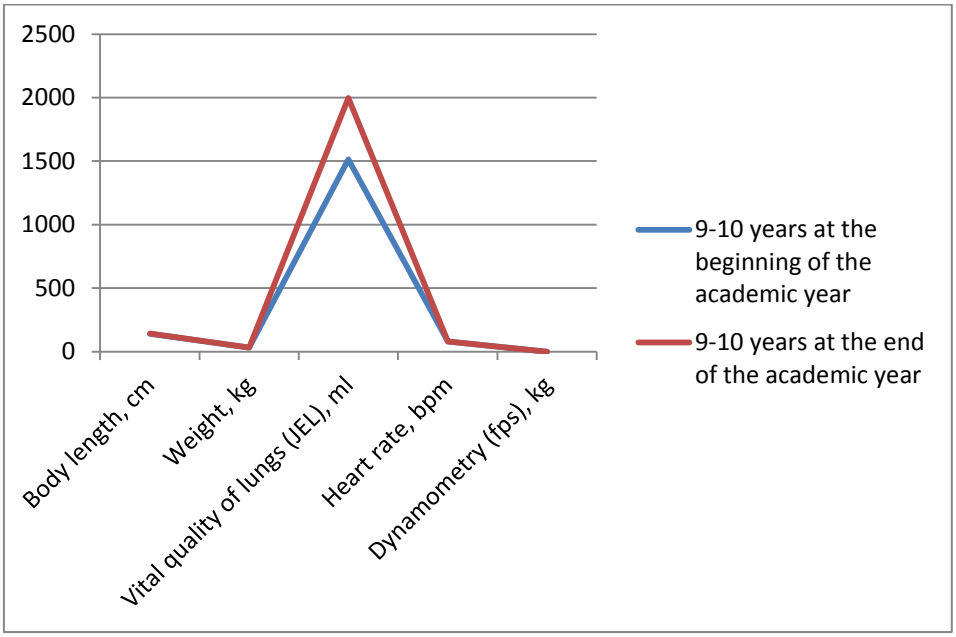

Figure 1- Dynamics of physical development of participants 9-10 years old

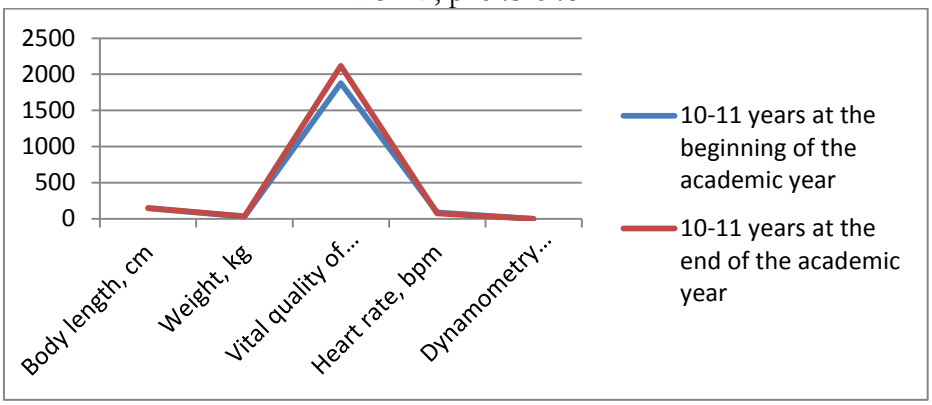

Figure 2- Dynamics of physical development of participants 10-11 years

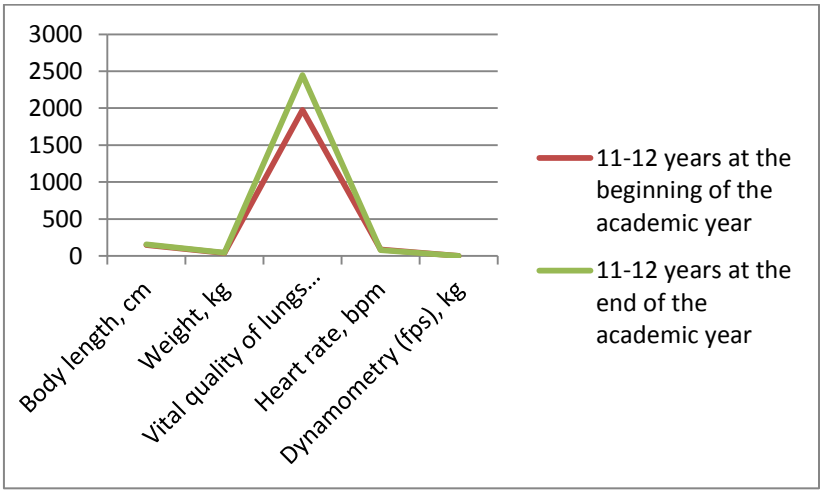

Figure 3- Dynamics of physical development of participants 11-12 years

Conclusions

In comparison with the data at the beginning of the academic year, in the middle of the academic year, there is an increase in all indicators of the physical development of children of three age groups engaged in synchronized swimming. Especially noticeable changes in the 11-12 year old age. All this provides opportunities for further improving the physical development of young athletes of 12 and younger age. In this regard, we will continue the experiment to determine the general physical training and the possibility of further practical application in the training process of synchronized swimming in our republic.