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Influence of health swimming lessons on the physical development of women 18–25 years old

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Purpose: *determine the degree of influence of health swimming lessons on changes in the physical development of women 18–25 years of age.*

Material & Methods: *the study involved 30 women 18–25 years. Data collection was carried out in the physical culture groups of the Author's School of Swimming Yu. V. Bliznyuk and the Pioner pool (public educational institution sport school for water sports Yana Klochkova). Subjects had the same swimming readiness. Applied: interrogation, testing, instrumental methods of studying the cardiovascular system. The obtained quantitative data were processed by methods of mathematical statistics.*

Results: *the study suggests that in women 18–25 years of health swimming exercises cause positive changes in physical development. In both groups of studied events, significant changes in anthropometric indicators and indicators of the state of the cardiovascular system. Significant improvement in indicators The most characteristic is revealed after a year of regular studies.*

Conclusion: *swimming exercises positively influenced the anthropometric indicators of women aged 18–25. It has been established that there have been significant improvements in the indices of the functional state of the cardiovascular system of women swimming. It was revealed that the anthropometric indices and indices of the functional state of the cardiovascular system after a year of occupations in comparison with the initial data were significantly high ($P(t)<0,01$; $P(t)<0,001$).*

Keywords: *swimming, women, indicators, body systems, physical development.*

Introduction

The negative impact of modern civilization on human health is a decrease in the biologically necessary level of motor activity and an increase in the psychoemotional burden; environmental pollution; bad habits (smoking, drinking alcohol, drugs, etc.). Currently, the search for new forms of motor activity of the population is urgent, since a sedentary lifestyle entails many diseases. Recently, there has been a significant increase in attention to the means and methods of health promotion, disease prevention. The leading role in the formation of a healthy lifestyle is attributed to the optimization of human motor activity in combination with hardening, rational nutrition, appropriate rest. According to experts, physical education and sports are a preventive means of maintaining and strengthening the health and prevention of various non-communicable diseases and bad habits, and the use of physical activity and sports in order to prevent morbidity requires little additional state expenditure [7].

The simplest way to improve the healing effect of motor activity is to combine its influence with the influence of the aquatic environment.

Swimming is very popular among various forms of recreational activities. Variety, constant updating of logically built programs, high emotional background of swimming practice allows this type of health-improving activity for many decades to maintain a high rating [1; 5–7; 10].

The sanative role of swimming, in comparison with other types of physical exercises, is the versatile effect of water on the human body, which is associated with the physical, thermal, chemical and mechanical properties of water. Staying in an aquatic environment during swimming sessions positively affects physical development, circulation, breathing and thermoregulation functions; stimulates the activity of the central nervous system and the higher nervous functions of man [2; 3]. The brightest effect of the aquatic environment is manifested in the case of deterioration of the psychoemotional state due to fatigue and functional disorders of the central nervous system. The impact of water can accelerate the formation of moving skills and recovery after tiring loads. Swimming is an effective means of preventing and treating diseases of the cardiovascular and respiratory systems. It is also shown in disorders of metabolism, posture, consequences of injuries of the musculoskeletal system, etc. [4–6].

Taking into account the literature data on the effect of swimming on the body, as well as the great popularity of swimming among various strata of the population, it can be stated that swimming is one of the most accessible and effective forms of health effects on the body that positively affects the physiological functions of the body.

According to a number of domestic and foreign authors [1; 5; 6] with regular swimming lessons, the cardiovascular and respiratory systems are improved, metabolic processes are activated, the physiological capabilities of the organism are increased, posture is improved, cheerfulness, good mood and other favorable changes are made that increase the person's capacity for action. However, their work does not provide enough scientific data on the change in the level of health and anthropometric indicators when practicing recreational swim-

ming. Insufficiency of data on positive changes in the physical development of those engaged under the influence of recreational swimming and prompted us to conduct this study [8; 11].

The relevance of the chosen topic is that the dissemination of the experience of such work meets the requirements of practice, and the information offered will help teachers, instructors, physical education methodologists, doctors, as well as self-employed to make better use of recreational swimming for health and physical readiness.

Purpose of the study: determination of the change in the physical development of women aged 18–25 under the influence of health swimming exercises.

Objectives of the study:

1. Determine the physical development of women 18–25 years of age engaged in groups of health-improving swimming.
2. Conduct a comparative analysis of changes in the physical development of the study population.
3. Develop practical recommendations for teachers on the use of recreational swimming in health groups.

Material and Methods of the research

Data collection was carried out in the physical culture groups of the Author's School of Swimming Yu. V. Bliznyuk and the pool "Pioneer" (public educational institution sport school for water sports Yana Klochkova). In our study, 30 women aged 18–25 took part, who regularly, 2–3 times a week, visit physical culture and health groups of swimming. The duration of one lesson is 45–60 minutes. By age, subjects were divided into 2 groups. The first group included women from 18 to 21 years (n=15), the second group included women from 22 to 25 years (n=15).

Subjects had the same swimming readiness. In both groups, the same set of exercises was performed on land and in water. With an equal number of repetitions, the complexity of the exercises, the amplitude of the movements, the difference was in choosing the method of swimming for the test subjects.

As is known, when teaching the swimming of adult people, first of all, the applied task of the steady mastering of the technique of one, and not necessarily sports, mode of swimming is put. Some experts also emphasize that the basis for training the swimming of an adult contingent should be modern technology of swimming, because sports methods of swimming have significant advantages over original, primarily speed of movement. Many authors argue that the fastest adult can teach you to swim on your back, breaststroke or on your side, because when swimming these methods do not necessarily make an exhalation in the water. In determining the method of swimming, age, individual abilities for mastering one method are taken into account (since adults are more capable of mastering one method of swimming). In order to establish which way of swimming will be easier to master, give the task to try to sail in known ways. Observations and fixation of various movements of hands and feet in original ways of swimming are conducted, with special attention being paid to what movements the legs perform by the subjects. If these movements resemble foot movements when swimming crawl way, breaststroke or on their side, then the practitioner offers one of these ways of swimming for training. However, the final choice of the method remains for the practitioner, since many people have a coordination predisposition to certain movements – in particular, to more effective performance of the foot movements with the crawl or breaststroke [9].

Table 1

Methods of swimming that the subjects used as their main during the health training sessions

Ways of swimming	Group I (n=15)		Group II (n=15)	
	n	%	n	%
Original ways	2	13,3	4	26,7
Crawl	3	20,0	2	13,3
Backstroke	5	33,4	3	20,0
Breaststroke	3	20,0	4	26,7
Owned in 2-3 ways	2	13,3	2	13,3

Subjects who participated in our study used both original and sporting methods of swimming during health training (Table 1).

In the period from October 2017 to June 2018, the level of physical development of women aged 18–25 was determined, which are engaged in recreational swimming. During the study, the physical development status of the test subjects was tested at the beginning of the experiment and after 9 months (in October 2017 – the initial indicators were taken; in June 2018, the indicators were recorded after a year of swimming). A comparative analysis of changes in the physical development of the study contingent.

During the data collection, the following methods were used: interrogation, testing, instrumental methods for studying the cardiovascular system. The obtained quantitative data were processed by methods of mathematical statistics.

Results of the research

During the study, measurements of anthropometric parameters (body length, body weight, chest circumference, waist, hips, arm biceps, hip) in both age groups were performed. The data obtained as a result of the study are given in Tables 2 and 3.

As can be seen from Table 2, under the influence of health swimming exercises, significant changes occurred in most indicators. So, after a year of regular swimming in the younger age group, we have reliable differences in the lower side of the initial data for such parameters as body weight, chest circumference, thighs, hip volume ($P(t)<0,01$) and waist $P(t)<0,001$). Exceptions were such parameters as body length and biceps volume ($P(t)>0,05$).

A similar picture can be observed in the second age group of those engaged (Table 3).

In this age group, the parameters of body weight, chest circumference, waist ($P(t)<0,001$), thighs and hip volume ($P(t)<0,01$) significantly changed. Such an indicator, as the volume of the arm bicep, increased, but insignificantly ($P(t)>0.05$), and the body length indices remained practically unchanged ($P(t)>0,05$).

Table 2

Anthropometric indicators of the I group engaged in recreational swimming, n=15

No. i/o	Indicators of measurement	Initial data	Data after 1 year	t	P(t)
1.	Body length, cm	164,54±1,23	164,39±2,37	0,62	>0,05
2.	Body weight, kg	59,07±1,45	54,72±1,43	2,14	<0,01
3.	Circumference of the chest, cm	88,90±0,86	84,36±1,95	2,16	<0,01
4.	Waist circumference, cm	68,05±1,30	62,57±1,27	3,07	<0,001
5.	Circumference of hips, cm	96,39±1,23	91,76±1,46	2,43	<0,01
6.	Arm biceps volume, cm	25,81±1,08	27,29±2,39	0,56	>0,05
7.	Thigh volume, cm	57,52±1,06	53,36±1,11	2,77	<0,01

Table 3

Anthropometric indicators of the II group engaged in recreational swimming, n=15

No. i/o	Indicators of measurement	Initial data	Data after 1 year	t	P(t)
1.	Body length, cm	169,74±1,83	169,89±2,57	0,48	>0,05
2.	Body weight, kg	73,97±1,15	67,92±1,25	3,78	<0,001
3.	Circumference of the chest, cm	97,92±1,06	92,36±0,95	3,97	<0,001
4.	Waist circumference, cm	80,05±1,12	74,57±1,27	3,42	<0,001
5.	Circumference of hips, cm	106,39±2,03	101,16±1,46	2,17	<0,01
6.	Arm biceps volume, cm	30,81±1,08	32,29±1,39	0,87	>0,05
7.	Thigh volume, cm	59,35±1,36	54,16±1,71	2,47	<0,01

In the course of our research, two widely used in practice works of highly informative and simple indicators-heart rate and blood pressure-were also measured as the most important indicators of the functional state of the cardiovascular system (Table 4) [12].
As can be seen from Table 4, under the influence of swimming lessons, there were significant changes in all indicators of the functional state of the cardiovascular system of the women studied.

The factor of the beneficial effect of swimming on the cardiovascular system is the normalization of blood pressure [11; 12]. Reliability of differences in the systolic blood pressure index after a year of occupations was revealed in both groups of subjects (P(t)<0,01). During the study period, systolic blood pressure in the 18-21 year old female group decreased from 119,29±2,97 to 110,21±1,97 mm Hg. and in the group of women 22–25 years old – from 131,43±2,25 to 123,57±1,80 mm Hg.

All the women who took part in the studies particularly notice differences in these indices of diastolic blood pressure (P(t)<0,001). During the year of systematic swimming sessions in young women of the I group, the diastolic pressure decreased from 82,14±1,88 mm Hg to 71,71±1,97 mm Hg and in more mature women (group II) – from 86,43±1,11 mm Hg to 78,00±2,04 mm Hg.

Analyzing the results of the study of blood pressure indicators, we can state that as a result of swimming lessons, most of the women tested managed to reduce the amplitude of blood pressure (the difference between the maximum and minimum pressure) and bring the pressure values closer to the age norm [4–8].

Among the various recorded parameters, heart rate (pulse) is an extremely important indicator for assessing the functional state of the body and the effectiveness of training. It is known that an increase in exercise is accompanied by a decrease in the pulse [12]. In our study, as a result of the regular application of the proposed swimming programs after a year of HR sessions in the group where the age of the subjects was 18–21, decreased by 7,14 beats min^{-1} (P(t)<0,001). In the II group (women 22–25 years), the decrease in heart rate occurred at 6,07 beats min^{-1} and stabilized on the basis on indicators 79,07±1,27 beats min^{-1} (P(t)<0,01).

In addition, independently counting the pulse, the subjects

Table 4

Dynamics of the cardiovascular system in women aged 18–25 under the influence of swimming during the year

No. i/o	Indicators of measurement	Initial data	Data after 1 year	t	P(t)
	Group I, n=15				
1.	Blood pressure (systolic), mm Hg.	119,29±2,97	110,21±1,97	2,59	<0,01
2.	Blood pressure (diastolic), mm Hg.	82,14±1,88	71,71±1,97	3,97	<0,001
3.	Heart rate, beats min^{-1}	78,14±2,75	71,00±1,70	2,23	<0,01
	Group II, n=15				
4.	Blood pressure (systolic), mm Hg.	131,43±2,25	123,57±1,80	2,80	<0,01
5.	Blood pressure (diastolic), mm Hg.	86,43±1,11	78,00±2,04	3,68	<0,001
6.	Heart rate, beats min^{-1}	85,14±2,27	79,07±1,27	2,43	<0,01

paid attention to its rhythm. According to the estimates of the majority of women (26 people out of 30–86,6%), as a result of regular health swimming exercises, the pulse strokes began to follow one after another at regular intervals, which also confirms the increased fitness and functionality of the cardiovascular system [4–8; 12].

The relationship between anthropometric indicators and the state of the cardiovascular system in both age groups is estimated as high. Between the indices of arterial pressure and pulse, the correlation relationship has an equisirected pattern and ranges from r=0,51 to r=0,83. This trend is typical for both age groups.

Conclusions / Discussion

As a result of the study conducted over the course of the year, it can be stated that health swimming exercises positively influenced the anthropometric indicators of women aged 18–25. It has been established that there have been significant improvements in the indices of the functional state of the cardiovascular system of women swimming. It was revealed that the anthropometric indices and the indices of the functional state of the cardiovascular system in comparison with the initial data were significantly high (P(t)<0,01; P(t)<0,001).

The dissemination of the experience of such work meets the requirements of practice, and the information offered will help teachers, instructors, physical education practitioners, doctors, and self-employed to make more effective use of recreational swimming to improve health and improve physical readiness.

Prospects for further research. Further research is planned to be carried out in the direction of studying the physiological mechanisms of adaptation processes to physical loads during recreational swimming.

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