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Innovative programs for recreational swimming and their impact on the physical development of women 30–40 years old

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Purpose: *to analyze the impact indicators of recreational swimming classes on the physical development of women 30–40 years old.*

Material & Methods: *data collection was carried out in the fitness groups of the Pioneer pool sport school on water sports named after Yana Klochkova. The study involved 20 women aged 30–40 years, 2–3 times a week, attend fitness groups swimming. The duration of one lesson is 45–60 minutes. A comparative analysis of changes in the physical development of the studied contingent in the process of applying innovative programs from recreational swimming was carried out. The methods used were: survey, testing, biomedical control. The obtained quantitative data were processed by methods of mathematical statistics.*

Results: *study suggests that in women 30–40 years old, recreational swimming classes cause positive changes in physical development. In both groups of the studied, significant changes in anthropometric indicators and indicators of the state of the cardiovascular and respiratory systems took place.*

Conclusions: *the targeted use of innovative recreational swimming programs positively influenced the anthropometric indicators of women aged 30–40. A significant improvement in the indicators of the functional state of the cardiovascular and respiratory systems of women involved in swimming was established. It was revealed that anthropometric indicators and indicators of the functional state of the cardiovascular system after a year of classes are significantly high compared to the initial data ($P(t)<0,01$; $P(t)<0,001$).*

Keywords: *recreational swimming, women, innovative programs, indicators.*

Introduction

Recently, there has been a significant increase in attention to the means and methods of promoting health and preventing disease in the population. The leading role in the formation of a healthy lifestyle is assigned to optimizing a person's physical activity in combination with hardening, rational nutrition, and appropriate rest. According to experts, physical education and sports is a preventive means of maintaining and strengthening the health and prevention of various noncommunicable diseases and bad habits, and the use of physical activity and sports in order to prevent morbidity requires insignificant additional costs of the state [4].

The physical education of women is considered as an integral part of the general system of their education and upbringing. Physical education is designed to maintain the high performance of women throughout all years of their life, they need to have the necessary knowledge and skills in the field of physical education, and ensure comprehensive development [1; 3; 5; 7]. However, at this time, as V.V. Ponomarev notes, the real volume of motor activity of women aged 30–40 does not ensure the full development and strengthening of the health of this contingent. According to A. P. Romanchuk, in recent years, as a result of a high load at work and at home, most women have a lack of movement during the day. A sedentary lifestyle affects the functioning of many systems of the body of women, especially the cardiovascular and respiratory, which leads to a decrease in the efficiency of the whole organism and especially the brain: attention is reduced, memory is weakened, coordination of movements is disturbed, the time of mental operations increases [5; 6; 10–13]. Therefore, the search for new forms of motor activity of women is currently relevant. One of these forms is recreational swimming. Many experts argue that recreational swimming turns into a lifestyle that leads to the physical and mental health of a person. Recreational swimming was also widely known among women of all ages. Swimming lessons are necessary in order to make a woman's figure more beautiful, and health better.

According to a number of domestic and foreign authors [6; 12], with regular swimming exercises, the cardiovascular and respiratory systems are improved, metabolic processes are activated, physiological capabilities of the body increase, posture improves, vitality, good mood and other favorable changes that increase a person's working capacity are acquired. However, in their works there remain many unresolved issues of the methodology for conducting recreational swimming classes; insufficient scientific data are provided on changes in the level of health and anthropometric indicators during recreational swimming exercises. The lack of information about changes in the physical development of people involved in recreational swimming, and prompted us to conduct this study [11].

The relevance of the chosen topic is that the dissemination of the experience of such work meets the needs of practice, and the proposed information will help teachers, instructors, physical education practitioners, doctors, as well as those who are engaged in their own activities, to use recreational swimming facilities more effectively to improve health and increase physical preparedness.

Purpose of the study: to analyze the impact indicators of recreational swimming classes on the physical development of women 30–40 years old.

Objectives of the study:

1. Determine the initial level of physical development of women 30–40 years old, engaged in groups of recreational swimming.

2. To conduct a comparative analysis of changes in the physical development of the studied contingent in the process of applying recreational swimming programs.

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 fitness groups of the Pioneer pool (sport school on water sports named after Yana Klochkova). Our study involved 20 women 30–40 years old who regularly attend swimming and fitness groups 2–3 times a week. The duration of one lesson is 45–60 minutes.

At the beginning of the study, a preliminary familiarization with the level of swimming preparedness of the subjects was carried out. In terms of swimming skills, subjects were divided into 2 groups. The first group included women who had a low level of swimming training – low swimming (n=10), the second – women swimming well (n=10).

In groups for weakly swimming (I group of women), it was first proposed, using the re-interval method, to study the technique of at least one swimming method (crawl on the chest or on the back, breaststroke, on the side) in order to master the wellness in 20–30 workouts distance corresponding to age (the norm of recreational swimming for persons of retirement age from 14 to 50 years is a distance of 1000 m [9]).

As you know, during training in swimming for adults, the applied task of mastering the technique of one, and not necessarily sports, swimming method is primarily related. Some experts also emphasize that the modern swimming technique should be at the heart of adult swimming training, since sports swimming methods have significant advantages over original ones, primarily in terms of speed. Many authors argue that most likely adults can be taught to swim on their backs, breaststrokes or on their sides, since when swimming with these methods it is not necessary to exhale into the water. When determining a swimming method, age, individual abilities to master one method (because adults are more capable of mastering one swimming method) are taken into account. In order to establish a method of swimming it will be easier to master give the task to try to swim in known ways. Observations and fixation of various movements of the arms and legs in distinctive swimming methods are carried out, with particular attention being paid to what kind of foot movements the subjects perform. If these movements are reminiscent of the movement of the legs when swimming with a crawl, breaststroke or on the side, then those who are engaged are offered one of these swimming methods for training. However, the final choice of the method remains with the person, mastering swimming skills, since many people have a coordination tendency to certain movements - in particular, to more efficiently perform movements of the legs with a crawl or breaststroke [8; 12].

Women who had sufficient knowledge of the technology of at least one of the swimming methods (II group of women) were offered to overcome the wellness distance using elements of the technique of various methods. They were recommended to swim on their side, with a crawl on their chest and back, breaststroke on their chest and back with gradual acceleration and at high speed; in the classroom, repeated, remote, uniform methods were used. Classes began from 300–500 m and for 10–20 classes, the distance increased to 800–1000 m.

In the process of the study, the state of the physical development of the subjects was tested at the beginning and after a year of regular classes (in October 2018 – the initial indicators were taken; in June 2019 – the indicators were recorded after a year of swimming). A comparative analysis of changes in the physical development of the studied contingent was carried out.

Having previously familiarized with the level of swimming training; taking into account the level of health, interests and needs of women, as well as adhering to the main stages of planning, recreational swimming programs have been drawn up.

Innovative wellness training programs included exercises that stimulate aerobic and anaerobic sources of energy production. When compiling programs, we were guided by the methodology for constructing and conducting training sessions of a health-improving orientation [3; 15–18]. So, in the process of training loads were dosed; constant pedagogical control of well-being, working capacity, desire to engage was ensured. To organize motor activity by means of swimming, the standard form of classes was used – wellness training, in each of which specific tasks were solved. So, in the preparatory part of the lesson, which was usually conducted on land, exercises were used that provided a gradual increase in heart rate and body temperature, preparation of the musculoskeletal system for further loads and increased blood flow to the muscles; increased mobility in the joints. The main part (conducted in water) was devoted to increasing heart rate to the level of the "target zone"; increasing the functionality of various body systems (cardiovascular system, respiratory, muscle) increase the necessary calorie costs when performing special exercises. In the final part of the exercises, exercises were used that gradually reduced metabolic processes in the body, relieved tension from working muscles, relaxed and stretched certain muscle groups, and reduced heart rate to a level close to normal.

The developed programs contained various training options for the content and duration of both its individual parts and the entire lesson. So, the recommended duration of classes ranged from 45 to 60 minutes. For the development of general endurance in certain types of classes, sometimes a power series of exercises was absent and due to this the aerobic part increased. For a group of weakly swimming women, the time allotted for a warm-up increased, and the number of stretching and relaxation exercises increased accordingly.

In the study, during data collection, methods of testing, interrogation, biomedical control were applied. The obtained quantitative data were processed by methods of mathemati-

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cal statistics.

Results of the research

During the study, measurements were made of anthropometric indicators (body length, body weight, chest, waist, hips) in both age groups. The data obtained as a result of the study are shown in Table 1.

Having examined and carefully analyzed the data obtained as a result of a survey of the contingent of both groups, it can be stated that under the influence of recreational swimming classes, significant changes took place in most indicators. So, after a year of regular swimming in the I group of women, we have significant differences to a smaller side from the initial data for such indicators as body weight (P(t)<0,001), waist and hips (P(t)<0,01). The exceptions were parameters such as body length and chest circumference (P(t)>0,05).

We can observe a similar picture in the second group of respondents, where the indicators of body weight, chest circumference and waist (P(t)<0.01) and hips (P(t)<0,001) significantly changed. An indicator such as body length remained virtually unchanged (P(t)>0,05).

At the beginning of the study, primary tests and tests were carried out, which helped to determine the initial level of physical fitness of women in both groups and contributed to the development of health training programs for swimming for the studied women of both groups [6]. Such primary data were recorded as: heart rate at rest, blood pressure, VC, respiratory retention on inhalation and exhalation (Stange and Genchi tests), respiratory rate.

In our study, samples and tests were performed twice: in October 2018 – using primary indicators of the functional state of the body at the time of registration, and after a year of systematic, focused exercises (June 2019). The data of physiological and functional indicators of women of I and II groups are given in Table 2.

The most important indicators of the functional state of the cardiovascular system are two highly informative and simple indicators that are widely used in practice – heart rate and blood pressure (Table 2) [12]. As can be seen from the table. 2, under the influence of swimming, significant changes took place in all indicators of the functional state of the cardiovascular system of the women studied. The significance of differences in systolic blood pressure after a year of classes was found in both groups of subjects (I group – P(t)<0,001; II group – P(t)<0,01, P(t)<0,001).

During the study period, systolic blood pressure indicators in the I group of women decreased from 135,34±1,25 to 127,82±1,53 mmHg., and in the II group of women – from 132,17±1,63 to 126,97±1,84 mmHg.

In all the women studied, there were noticeable differences in these indicators of diastolic blood pressure (P (t) <0.001). During the year of systematic swimming classes in women of group I, the indicators of diastolic pressure decreased from 87,56±1,95 mmHg. to 79,15±1,67 mmHg. and in the II group of women – from 85,34±1,95 mmHg. to 76,83±2,01 mmHg. As you know, a factor in the positive effects of swimming on the cardiovascular system is the normalization of blood pressure [11; 12]. Analyzing the results of a study of blood pressure indicators in both groups of subjects, it can be stated that as a result of recreational swimming exercises for most of the tested women, it was possible to reduce the amplitude of blood pressure (the difference between the maximum and minimum pressure) and bring the pressure indicators closer to the age norm [2; 14; 16; 17].

An extremely important indicator for assessing the functional state of the body and the effectiveness of training is such an indicator as heart rate (pulse). It is known that an increase in fitness is accompanied by a decrease in heart rate [1; 15; 18]. In our study, as a result of the regular use of the proposed swimming programs, after a year of training heart rate in group I decreased by 6,13 beats·min^{-1} (P(t)<0.001). In group II, a decrease in heart rate occurred by 5,91 beats·min^{-1} and stabilized on indicators 80,27±1,74 beats·min^{-1} (P(t)<0,01).

The analysis of the results of the functional state of the respiratory system revealed the absence of significant differences between the VC indicators at the beginning and at the end of the study, both in women of the first and second groups of women. These data show that, under the influence of recreational swimming, the vital capacity of the lungs improves, but the differences are not significant (P(t)>0,05). When analyzing the results of the Stange and Genchi tests in both groups, significant changes are observed between the indicators at the beginning and at the end of the study (P(t)<0,001). Posi-

Table 1

Anthropometric indicators of the I and II groups of women 30–40 years old who are engaged in recreational swimming

No. i/o	Measurement indicators	Initial data	Data after 1 year	t	P(t)
		I group, n=10			
1.	Body length, cm	168,54±1,23	168,39±1,37	0,08	>0,05
2.	Body weight	66,27±1,41	63,58±1,47	3,4	<0,001
3.	Chest circumference, cm	97,83±1,92	92,95±1,87	1,83	>0,05
4.	Waist circumference, cm	78,01±1,37	72,42±1,31	2,98	<0,01
5.	Hip circumference, cm	91,92±1,36	86,81±1,52	2,51	<0,01
		II group, n=10			
1.	Body length, cm	174,78±1,36	174,45±2,41	0,11	>0,05
2.	Body weight	69,94±1,53	64,38±1,39	2,72	<0,01
3	Chest circumference, cm	108,27±1,53	102,62±1,86	2,37	<0,01
4.	Waist circumference, cm	81,93±1,47	76,69±1,32	2,65	<0,01
5.	Hip circumference, cm	96,78±1,35	90,63±1,37	3,20	<0,001

Table 2

Dynamics of functional indicators of the I and II groups of women 30–40 years old under the influence of recreational swimming

No. i/o	Measurement indicators	Initial data	Data after 1 year	t	P(t)
	I group, n=10				
1.	Heart rate at rest, beats. min^{-1}	87,29±1,39	81,16±1,32	3,20	<0,001
2.	Blood pressure (systolic), mmHg	135,34±1,25	127,82±1,53	3,80	<0,001
3.	Blood pressure (diastolic), mmHg	87,56±1,95	79,15±1,67	3,28	<0,001
4.	VC, L	2,90±0,17	3,32±0,29	1,39	>0,05
5.	Sample Stange, s	48,86±1,23	54,66±1,36	3,16	<0,001
6.	Sample Genchi, s	37,19±1,78	45,50±2,34	3,55	<0,001
7.	Respiratory rate at rest (per minute.)	15,34±0,96	12,92±1,18	1,46	>0,05
	II group, n=10				
1.	Heart rate at rest, beats. min^{-1}	86,18±1,25	80,27±1,74	2,76	<0,01
2.	Blood pressure (systolic), mmHg	132,17±1,63	126,97±1,84	2,12	<0,01
3	Blood pressure (diastolic), mmHg	85,34±1,95	76,83±2,01	3,04	<0,001
4.	VC, L	2,89±0,37	3,28±0,19	0,97	>0,05
5.	Sample Stange, s	47,63±0,86	54,15±1,63	3,54	<0,001
6.	Sample Genchi, s	40,51±2,35	48,91±1,47	3,03	<0,001
7.	Respiratory rate at rest (per minute.)	16,98±1,37	12,05±1,74	2,23	<0,01

tive changes have also occurred in respiration rate. So, in group I, the respiratory rate decreased from 15,34±0,96 times per minute to 12,92±1,18. But the differences between the beginning and end of the study turned out to be unreliable (P(t)>0,05), while in group II the respiratory rate decreased from 16,98±1,37 times per minute to 12,05±1,74 – the differences are significant (P(t)<0,01).

Conclusions / Discussion

Based on the analysis of special scientific and methodological literature, practical experience, and the result of our own research, we revealed a high need for women to engage in physical-health-improving types of physical culture. An analysis of literary sources indicates that physical education programs do not fully provide the motivation for a healthy lifestyle, do not involve mental and physical activity, and do not take into account the peculiarities of the change in the biorhythmics of the female body.

In this regard, one of the promising directions in the innovation of physical education of women may be the development and implementation of recreational swimming programs with adjustable physical activity.

The study found that the functional state of women significantly changes during training in the health swimming groups (P(t)<0,01; P(t)<0,001). It can be stated that recreational swimming classes had a positive effect on the anthropometric indicators of women aged 30–40. The targeted use of innovative recreational swimming programs contributes to a significant reduction in body weight, which can significantly improve motor, functional fitness and health, increase the emotional state and motivation for regular physical exercises in water, and form a sustainable need for them.

During the year of swimming, significant improvements were made in the indicators of the functional state of the cardiovascular and respiratory systems of women. It was revealed that anthropometric indicators and indicators of the functional state of the cardiovascular and respiratory system compared with the initial data are significantly high (P(t)<0,01; P(t)<0,001).

Dissemination of the experience of such work meets the needs of practice, and the proposed information will help teachers, instructors, physical education practitioners, doctors, as well as those who are engaged in their own activities, to use recreational swimming aids more effectively to improve health and increase physical preparedness.

Prospects for further research include research in the direction of studying the physiological mechanisms of adaptation processes to physical activity during recreational swimming classes and the development of swimming programs for adults, which will take into account not only physiological and functional indicators, but also the characteristics of work. It is necessary to further introduce innovative programs in the educational and tertiary process of groups for improving swimming pools and sports clubs.

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References

1. Amosov, I.V. & Zemskov, Ye.A. (2000), "Peculiarities of the influence of complex exercises in gymnastics and swimming with a health-improving focus on the main components of physicalfitness of women aged 21-35", *Teoriya i praktika fiz. kultury*, No. 6, pp. 23-26. (in Russ.)
2. Balamutova, N.M., Kozhukh, N.F., Sheyko, L.V. & Oleynikov, I.P. (2006), "Changes in the physical development and physical fitness of women aged 35-50 years who are engaged in recreational swimming groups", *Fizicheskoe vospitanie studentov tvorcheskih spezialnostej*, No. 1, pp. 57-61. (in Russ.)
3. Kardamonov, N.N. (2001), *Plavanie: lechenie i sport* [Swimming: treatment and sport], Fizkultura i sport. (in Russ.)

Sheiko, L. (2019), "Innovative programs for recreational swimming and their impact on the physical development of women 30–40 years old", *Slobozhanskyi Herald of Science and Sport*, Vol. 7 No. 4(72), pp.48 -52, doi: 10.5281/zenodo.3540323

4. Laflin, T. (2012), *Like a fish in water. Effective swimming techniques available to everyone*, Mann, Ivanov i Ferber. (in Russ.)
5. Ponomareva, V.V. (2001), *Fizicheskaya kultura i zdorove* [Physical Culture and Health], SGIFK, Smolensk. (in Russ.)
6. Romanchuk, O.P. (2010), *Medical and pedagogical control in the physical fitness: navch.-metod. pos.*, Odesa. (in Ukr.)
7. Houli, T.E. (2000), *Improving fitness*, Kiev. (in Russ.)
8. Sheyko, L.V. (2012), "The choice of a method for mastering the optimal distance of recreational swimming for men 51-60 years old", *Slobozans`kij naukovo-sportivnij visnik*, No. 1, pp. 18-21. (in Russ.)
9. Sheyko, L.V. (2014), "The relationship and differences of sports, recreational and recreational swimming", *Visnik Chernigivskogo nazional-nogo pedagodicheskogo universitetu*, Vol. 3, No 118, pp. 314-317. (in Russ.)
10. Sheyko, L.V. (2016), "Estimation of the influence of recutational swimming on the level of the physical state of women", *Fizichna utabili-tatsiya ta rekreatsiyno-ozdorovchi tekhnologii*, No 3, pp. 263-269. (in Russ.)
11. Sheyko, L.V. (2017), "Dynamics of the physical and psychoemotional state of women under the influence of swimming", *Slobozans`kij naukovo-sportivnij visnik*, No. 1(57), pp.121-126, doi: 10.15391/snsv.2017-1.021. (in Russ.)
12. Sheyko, L.V. (2018), "Dynamics of indicators of the functional state of the cardiovascular and respiratory systems of women under the influ-ence of swimming", *Slobozans`kij naukovo-sportivnij visnik*, No. 1(63), pp. 121-125, doi: 10.15391/snsv. 2018-1.022. (in Russ.)
13. Shulga, L.M. (2008), *Wellness swimming*, Olinpijska literatura. (in Ukr.)
14. Brian J. Sharkey & Steven E. Gaskill (2006), "Fitness & Health", *Human Kinetics*, No. 6, p. 429.
15. Le Corre, E (2014), *The History is Phesical Fitness*, available at: http://www.artofmanliness.com/2014/09/24/the-history-of-hysical-fit-ness/.
16. Sifferman, J. (2009), *Physical Culture: it's more than just bodybuilding, muscles, and oid-time strongmen training culture*, available at: http://physicalliving.com/phesical-culture-its-more-than-just-bodybuilding-muscles-and-oid-time-strongmen-training-culture/.
17. Wilmore, J.H., Costill, AD.L. (1994), *Physiology of sport and Exercise – Champaign: Human Kinetics*.
18. Encyclopedia BRITANNICA (2018), Darwinian fitness, available at: https: //www.britannica.com/science/Darwinian-fitness.

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