

Indicators of physical condition of women who are engaged in health-improving aerobics

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Purpose: to learn physical condition of women for the increase of efficiency of sports and health-improving classes.

Material & Methods: 20 women of 21–35 years old who are engaged in health-improving aerobics took part in the stating experiment. The assessment of physical condition is carried out by means of the method of indexes and the equations of regression.

Results: it is established in the course of the researches that 45% of participants of the experiment have the level of physical condition "below the average", and 55% – "low", at the same time persons with the highest indicators are not registered.

Conclusions: results of the research added and expanded the existing conclusions about morphofunctional characteristics of physical condition of women who are engaged in different types of sports and health-improving classes.

Keywords: aerobics, physical condition, women.

Introduction

Aerobics is one of the popular types of health-improving physical culture, to what the numerous number of the research works testifies, which are devoted to the problems of the effective organization of classes by health-improving aerobics and to studying of their influence on physical condition of the engaged [2; 5; 6; 10; 17, etc.].

Health-improving aerobics as symbiosis of various means and methods of physical education is fully capable to satisfy the requirement of the engaged in physical activity and, the most important, to provide the achievement of socially important results: due level of physical health, optimum physical development, culture of movements, and esthetics of physical image [1].

It is well known that the solution of health-improving tasks in the course of the classes by physical exercises depends on the adequate selection of means and methods of impact on organism of the engaged. But at the same time the data [2; 19; 21] demonstrate that the effective creation of training loads with women needs to be carried out not only from the position of sexual dimorphism and the related physiological features of a female body, not only from the position of age features, but it is necessary also to consider actual morphological state and functional preparedness of organism of the engaged.

It follows from the above that carrying out the stating pedagogical experiment, which is directed to obtaining information on physical condition of women, is expedient and relevant.

Communication of the research with scientific programs, plans, subjects

The work is performed according to the consolidating plan of the research state budgetary work of the chair of physical education and sport of State Higher Educational Institution

"National Mining University" for 2013–2015.

Purpose of the researches:

to study physical condition of women for the increase in efficiency of sports and health-improving classes.

Material and Methods of the research

The stating pedagogical experiment is conducted for the achievement of the purpose on the basis of department of physical training and sport of State Higher Educational Institution "National Mining University" (Dnipropetrovsk) with the participation of 20 women of 21–35 years old ($X=27,05$ of years old) from them 5 people – students of higher education institution and 15 people – employees.

Results of the pedagogical experiment were registered in «The diary of control of state of health in the course of classes by physical exercises of health-improving orientation». «The diary ...» is developed for each participant of the program and introduced in the recreational process; it is calculated for the implementation of stage-by-stage and current control of physical control with fixing, analysis and assessment of the received results of the pedagogical testing.

They were guided by the data of references [7; 11; 13; 19; 22], and also results of own researches and long-term experience of carrying out researches in this area at the choice of methods of assessment of physical condition [14–17; 25, etc.]. So, the final judgment of physical condition of women is based on the results, which were received by means of method of indexes, and the equations of regressions, which often use at mass inspections and have number of advantages, namely: do not create any organizational and material difficulties, but they are informative at the same time.

It is used for the assessment of physical development:

- *body weight index* (BWI) – for the determination of norm of body weight, orientation and intensity of health-improving trainings with the corresponding food mode;
- *vital index* – for the definition of functionality of the organs of external respiration, showing what volume of air from the vital capacity of lungs is the share of each kilogram of body;
- *indicator of percentage of animal force* to body weight (power index).

It is noted in references [8; 22; 24] that studying of the component structure of body is a widely applied procedure which results supplement information on physical development of a person, level of his motor activity and on about food status, and, above all it is one of the main indicators of efficiency of sports and health-improving classes.

Besides, on observations of S. D. Runenko [24] indicators of BWI which are often used for the assessment of physical development are not informative in practice of health-improving training as do not reflect the structure of body. Therefore indicators of maintenance of fatty and musculoskeletal components of body are much more important also informative as [22]:

- maintenance of fat in organism is basic at the choice of intensity of the mode of sports and health-improving classes and their orientation;
- musculoskeletal bulk defines need of use in the course of the classes of the exercises and methods, which are aimed at

the development of muscle bulk.

Gallagher formula et al was used for the definition of percentage of fat in organism, and for the determination of musculoskeletal bulk – Baumgartner equation. The received values are compared with age norms [22].

The importance of morphological data increases in combination with the assessment of functionality of organism [20], and are used in these researches:

- *index of Robinson* which defines the degree of economization of the cardiovascular system at the integrated level;
- *shock index*, allows to define possibility of dysfunctions in activity of the cardiovascular system which are followed by the deterioration in the system hemodynamics;
- *index of Ruffier* – adaptation of the cardiovascular system to standard exercise stress;
- *adaptation potential* – assessment of functional reserves of organism.

Mathematic-statistical processing of the received results was made on the personal computer with use of the program Microsoft Office Excel 2007 taking into account the existing recommendations [4].

Results of the research and their discussion

The statistical characteristics and assessment of indicators of

Table 1
The statistical characteristics and assessment of indicators of physical condition of women, which were received during the stating experiment (n=20)

Statistical characteristics of indicators			Assessment
Body weight index, g·sm ⁻¹	\bar{X}	22,47	body weight in normal
	σ	3,13	
	V, %	13,92	
Content of fat in organism, %	\bar{X}	28,19	“moderately high” level of percentage of fat in organism
	σ	5,52	
	V, %	19,58	
Content of musculoskeletal bulk, %	\bar{X}	35,87	norm
	σ	3,68	
	V, %	10,26	
Power index, %	\bar{X}	51,47	“average” indicator of percentage of animal force to body weight
	σ	8,85	
	V, %	17,20	
Vital index, ml·kg ⁻¹	\bar{X}	48,53	“below the average” indicator of functionality of the organs of external respiration
	σ	7,78	
	V, %	16,04	
Index of Robinson, s. u.	\bar{X}	97,40	“below the average” level of economization of the cardiovascular system
	σ	14,36	
	V, %	14,74	
Shock index, s. u.	\bar{X}	0,66	possibility of dysfunction of activity of cardiovascular system is absent
	σ	0,10	
	V, %	15,04	
Adaptation potential, s. u.	\bar{X}	2,40	satisfactory adaptation, sufficient reserves of organism
	σ	0,29	
	V, %	12,06	
Index of Ruffier, s. u.	\bar{X}	9,78	“good” adaptation of the cardiovascular system to standard exercise stress
	σ	4,17	
	V, %	42,68	

physical condition of women of 21–35 years old, which were received during the stating pedagogical experiment, are submitted in tab. 1.

Generalizing the obtained data, it is possible to draw conclusion about “below the average” level of physical development of women to what the indicators which are not meeting age standards testify. Namely, excess body weight is observed (in 40% of cases); high percent of content of fat in organism (at 60% of women); below the average level of functionality of the organs of external respiration (at 70% of participants) are observed at this category of persons. But at the same time indicators, which characterize the development of musculo-skeletal bulk and animal force correspond to the due level.

The registered results of calculations of the functional equations supplement information on features of physical condition of women. So, indicators of index of Robinson certify that «below the average» level of functional condition of the cardiovascular system is diagnosed for participants of the experiment. However indicators of index of Ruffier, index of shock and adaptation potential specify that actual state of functional systems of female body will react adequately to standard exercise stress.

Further, we will note throughout the discussion of results of researches that information for the development of contents and technique of classes is analyzed by health-improving aerobics at the individual and group method of the organization, and the level of physical condition (LPC) is chosen as criterion in this work for the distribution of women to groups. Rather known scientific approach to programming of sports and health-improving classes on the accounting of LPC which are engaged [9] formed the basis for this purpose.

We paid attention to results of the scientific research by N. O. Goglyuvataya at the choice of method of assessment of LPC of women [3] that the assessment of physical condition according to Ye. A. Pirogova is rather informative and has a high correlation communication with morphofunctional indicators. So, these researches of morphofunctional status are added with the assessment of level of physical condition of women (tab. 2).

The received results of the stating experiment allowed to define the main orientation of sports and health-improving

classes with women of 21–35 years old – to promote the achievement of the due LPC. And some morphofunctional indicators which do not have reliable differences ($p > 0,05$) between groups of persons with different UFS – index of Ruffier, vital index, indicate that the priority of the planned classes are to promote the increase in the level of functional condition of the cardiovascular and respiratory systems.

Besides, the decrease in body weight – is for the achievement of the main purpose, which is set before themselves by women at the beginning of the training process [15] and to promote the correction of constitution, not rather only regularly and to attend classes systematically for the solution of task. In this case it will be effectively to recommend to these persons to balance diet, to follow norms and the rules of food in the course of the classes by physical exercises. And this indispensable condition of the effective implementation of programs of the correction of figure.

So, results of these researches added and expanded the existing numerous conclusions [12; 16; 23, etc.] about the morphofunctional features of the women who are engaged in different types of sports and health-improving classes will also be coordinated in many respects with the conclusions of S. V. Sologubova [19], namely that, despite “low” and “below the average” levels of physical condition, morphofunctional characteristics of participants of the experiment are generally within indicators of the general health.

Conclusions

The development of the content and the technique of classes by health-improving aerobics taking into account the established level of physical condition will be directed to the correction of constitution of women of 21–35 years old due to the decrease in body weight, the decrease in percentage of fat in organism, and also on the increase in the level functional condition of the cardiovascular and respiratory systems of the engaged on the basis of results of the stating experiment.

Prospects of further researches: to prove the content and the technique of classes by health-improving aerobics of the complex type experimentally at the expense of the combination of exercises of aerobic and power orientation for the purpose of the increase in level of physical condition of women.

Table 2

The statistical characteristics morphofunctional of indicators depending on the level of physical condition of women, which was established during the stating experiment (n=20)

Indicators	Level of physical condition		t	p
	below the average (n=9)	low (n=11)		
	$\bar{X} \pm \sigma$			
Age, years	26,22±4,97	27,23±5,46	0,49	>0,05
Body weight index, kg·m ⁻²	20,06±2,38	24,44±2,14	3,86	≤0,01
Content of fatty body weight, %	23,82±10,23	31,76±3,05	4,41	≤0,001
Content of musculoskeletal bulk, %	38,18±2,08	33,82±3,84	3,22	≤0,01
Power index, %	55,54±5,86	48,15±9,72	2,099	≤0,1
Vital index, ml·kg ⁻¹	49,57±9,92	47,68±5,58	0,50	>0,05
Index of Robinson, s. u.	85,11±5,78	107,45±10,87	5,87	≤0,001
Shock index, s. u.	0,66±0,12	0,67±0,08	0,14	>0,05
Index of Ruffier, s. u.	8,93±4,93	10,47±3,53	0,79	>0,05
Adaptation potential, s. u.	2,13±0,14	2,82±0,36	5,89	≤0,001

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