

PHYSICAL HEALTH OF YOUNG AND MIDDLE AGE WOMEN UNDER INFLUENCE OF STEP-AEROBICS EXERCISES

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Abstract. *Purpose:* to determine the degree of step-aerobics exercises' influence on 20-35 years age women's health. *Material:* in the research 28 women of 20-35 years old age participated. Anthropometric indicators, heart beats rate in rest and after load (20 squats for 30 sec.), blood pressure, vital capacity of lungs, hand dynamometry were registered. *Results:* level of physical health has been determined; influence of step-aerobics on women's health has been found; age differences in the tested indicators have been analyzed. It was found out that step-aerobic trainings influence greatly on the following indicators: body mass, circumferential sizes and cardio vascular system; on functioning of respiratory system, strength of hand's flexors and regulation of 31-35 years age women's cardio-vascular system. *Conclusions:* application of step-aerobic exercises positively influenced on health of 20-35 years old women.

Key words: physical education, health, women, step-aerobics.

Introduction

Recent time, in Ukraine steady tendency to worsening of young and adult population's health has been being observed. Social-economical instability, strengthening of psycho-emotional tension noticeably increase requirements to functional and physical condition of workable population, which is main labor and resource potential of the state [2]. Physical culture, which dominates in increasing of population's motor functioning, takes one of priority places.

By opinion of a number of authors fitness has great health related effect and is one of progressive kinds of motor functioning [13, 14, 15, 19].

In process of our researches we found positive influence of different forms of fitness on health, physical fitness, organism's functional state, mental and physical workability of schoolchildren [12], students [8, 10, 16-18, 21], 15-16 years old boys and girls [4], men of young and middle age [1].

A number of researches dealt with studying of influence of fitness and its kinds (aerobics, aqua-aerobics, body-fitness) on women's organism [3, 5-7, 11, 20]. With it influence of step-aerobics exercises on physical health of young and middle age women's health has not still been cleared up.

Purpose, tasks of the work, material and methods

The purpose of the research is to determine the degree of step-aerobics exercises' influence on 20-35 years age women's health.

The methods of the research: theoretical analysis and generalization of scientific-methodic literature, pedagogic experiment, methods of mathematical statistics. For determination of physical health level we used methodic of G.L. Opanasenko and N.A. Naumenko [9]. We registered anthropometric indicators; heart beats rate in rest and after loads (20 squats for 30 sec.); blood pressure; vital capacity of lungs; hand dynamometry.

The researches were conducted on the base of fitness-club "Zviozdnyy", Kharkov. 28 women of 20-35 years' age participated in the research. They composed two experimental groups: first group – 20-30 years old women; second group – 31-35 years old women. In the course of experiment, in their training program step-aerobics exercises with application of step platforms were included. From these exercises we made complexes to be fulfilled in different positions and travels.

Results of the research

The received results were compared with assessment scale, presented by V.A. Romanenko [9] (see table 1). We found that health condition of both groups' women correspond to "low level".

Analysis of results in age aspect showed absence of confidence distinctions with general tendency to increase indicators with age ($p > 0.05$). Results of measurements of waist circumference, which decrease with age, were the exclusion.

It was found out that body mass and circumferential sizes' indicators of both groups' women significantly changed: weight and hips and waist circumferences noticeably reduced in comparison with initial data (see table 2). These changes are confident ($p < 0.05 - 0.001$). For example, reduction of 1st group's body mass indicators was 4.3%, of 2nd group – 6.3%; waist circumference – 2.0 and 8.7%, hips circumference – 1.1% and 7.6%. Thus, indicators of body mass and circumferential sizes changed in the most noticeable way in women of 31-35 years old age. Indicators of body length did not changed significantly in all tested groups ($p > 0.05$).

Table 1

Physical health of 20-35 years old women before and after experiment

Groups		Body mass (body length (cm))	VCL/body mass (ml/kg)	Hand dynamometry/body mass (%)	HBRx BP/100	Time of HBR restoration (min/sec)	Points	General assessment of health
		<i>Before experiment</i>						
1 group	\bar{X}	36.7	38.1	36	50.9	3.2	-	Low
	points	-2	-1	-1	5	-2	-1	
2 group	\bar{X}	38.3	37	40	51.7	3.4	-	Low
	points	-2	-1	-1	5	-2	-1	
<i>After experiment</i>								
1 group	\bar{X}	35.1	50.2	42.9	47.2	2.03	-	Below average
	points	-2	1	0	5	1	5	
2 group	\bar{X}	35.9	49.4	45.6	42.8	2.31	-	Below average
	points	-2	1	0	5	1	5	

Notes: VCL– vital capacity of lungs; HBR – heart beats rate; BP – blood pressure.

Table 2

Physical health indicators of 20-35 years old women before and after experiment

№	Indicators	1 group		t	p	2group		t	p
		Before experiment	After experiment			Before experiment	After experiment		
		$\bar{X} \pm m$				$\bar{X} \pm m$			
1.	Body mass, kg	60.3±3.9	57.7±3.71	6.38	<0.001	64.8±3.56	60.7±2.95	6.18	<0.001
2.	Body length, cm	164.8±2.07	164.8±2.07	-	-	169.4±2.09	169.4±2.09	-	-
3.	Waist circumference, cm	73.5±2.58	72.0±2.63	2.58	<0.05	71.8±3.02	65.5±3.01	11.11	<0.001
4.	Hips circumference, cm	99.0±3.10	97.7±3.05	4.12	<0.01	100.0±2.27	92.4±2.06	8.45	<0.001
5.	HBR, b.p.m ⁻¹	39.7±1.82	37.8±1.43	2.63	<0.05	40.2±1.30	35.1±1.18	4.72	<0.01
6.	BP _{sys} , mm.merc.col.	128.4±3.19	125.0±1.88	2.12	>0.05	128.7±2.63	122.0±1.04	2.78	<0.05
7.	VCL, l	2.3±0.16	2.9±0.16	3.65	<0.01	2.4±0.20	3.0±0.18	6.16	<0.001

№	Indicators	1 group		t	p	2group		t	p
		Before experiment	After experiment			Before experiment	After experiment		
		$\bar{X} \pm m$				$\bar{X} \pm m$			
8.	Right hand dynamometry, kg	21.8±1.95	24.8±2.13	3.93	<0.01	26.4±2.85	27.7±2.78	2.25	>0.05
9.	Left hand dynamometry, kg	21.4±1.30	23.5±1.39	2.84	<0.05	21.5±2.58	22.8±2.61	2.29	>0.05
10.	Time of HBR restoration after load, min.sec.	3.20±0.18	2.03±0.15	3.51	<0.01	3.40±0.18	2.31±0.18	2.8	<0.05

Notes: VCL– vital capacity of lungs; HBR – heart beats rate; BP_{syst} – systolic blood pressure.

Analysis of repeated results of cardio-vascular system showed improvement of heart beats rate and systolic blood pressure in both age groups ($p < 0.05; 0.01$). For example, improvement of HBR in 1st group was 4.8%; in 2nd group – 12.6%; BP – 2.6 and 5.2%. Thus, the highest changes took place in group of 31-35 years old women.

It was detected that vital capacity of lungs in both groups significantly and confidently improved ($p < 0.01; 0.001$). Increment of indicators was: 20.6% – in 1st group and 20.0% – in 2nd group. Thus, the most significant changes took place in group of 20-30 years old women.

Analyzing indicators of hand flexors' strength we found that in both tested groups results improved after experiment. However, differences were confident only in indicators of 1st group ($p < 0.05; 0.01$). For example, increment of right hand dynamometry indicators in 1st group was 12.0%, left hand – 8.5%; in second group – 4.7% and 5.7% accordingly.

Thus the most significant increment of dynamometry of both hands took place in group of 20-30 years old women.

Analysis of indicators of heart beats rate restoration after definite dosed load showed that results of both groups' women improved confidently ($p < 0.05, 0.01$). Indicators' improvement in 1st group was 36.5%, and in second – 32.0%. Thus, indicators of cardio-vascular system's regulation changed most significantly in 20-30 years old women.

Analysis of repeated physical health indicators in age aspect did not reveal any substantial changes in comparison with initial data. Exclusions were: hips circumference indicators; systolic blood pressure and left hand dynamometry. Results of 2nd group's women became better after experiment than in 1st group. However, these differences are not statistically confident ($p > 0.05$).

Comparison of experimental results with standard data [9] (see table 1) shows that in both groups' women physical health level increased and correspond to level "below average".

Thus, results of the conducted researches witness about positive influence of step-aerobics trainings on health of 20-35 years' age women. It was found that step-aerobics influences on the following indicators:

- body mass and cardio-vascular system of 31-35 years' age women;
- functioning of respiratory system, strength of hand flexors and regulation of cardio-vascular system of 20-30 years' age women.

Discussion

Analysis of scientific-methodic literature showed that there is a number of works, devoted to influence of different kinds of fitness on health condition, physical fitness, mental and physical workability of different age contingent [1, 12, 16-18, 21].

On the base of this analysis and generalization of the results of our research we expanded data [3, 5-7, 11, 20] about influence of different kinds of fitness on women's organism. We supplemented data [4, 8, 10] about step-aerobics positive influence on human organism. For the first time we determined influence of step-aerobics exercises on physical health of 20-35 years old women. The most sensitive to step-aerobics exercises parameters of physical health have been

detected. The most favorable age periods for development of certain physical health indicators under influence of step-aerobics have been also determined.

Conclusions:

1. Initial data of physical health parameters permitted to determine “low” level of 20-35 years’ age women’s health and they do not differ in age aspect.
2. Application of worked out by us step-aerobics exercises in trainings positively influenced on physical health of young and middle age women. Their health level improved from “low” to “below average”. 31-35 years old women demonstrated substantial changes of body mass indicators, circumferential sizes and functioning of cardio-vascular system. In 20-30 years old women indicators of respiratory system, strength of hand flexors and cardio-vascular system’s regulation noticeable improved.

Further researches in this direction can be realized by means of determination of step-aerobics influence on physical workability of young and middle age women.

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Conflict of interests

The author declares that there is no conflict of interests.

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