

Improving the level of physical development and functional preparedness athletes in sports dancing on the stage of specialized basic training means step aerobics

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Purpose: make analyze the impact of the step aerobics on the indicators of physical development and functional preparedness of athletes in Dance Sport on the stage of specialized basic training.

Material & Methods: 20 athletes (10 sport duets) aged 14–15 years were divided into two groups: control (CG) and experimental (EG). To achieve the objectives we used methods: theoretical - analysis and synthesis data of scientific and methodological literature; pedagogical methods: pedagogical observation; pedagogical testing; medical and biological methods: anthropometry, functional methods of research; methods of mathematical statistics.

Results: after the implementation of a training process means step aerobics significantly improved indicators of cardio-respiratory system of athletes in Dance Sport.

Conclusions: materials research to assess allow us to estimate the extent of influence of step aerobics on indicators of physical development and functional preparedness athletes in Dance Sport on the stage of specialized basic training.

Keywords: athletes 14–15 years, Dance Sport, physical development, functional preparedness, step aerobics.

Introduction

At this stage of development sport dancing there is stiff competition sports duets in the world [2; 8]. Competitive activity in Dance Sport requires multiple performance intensive and difficult at the same time coordination exercise during of performance the five competitive dance programs in the final session [5; 9]. Sometimes victory in the competition depends on how effective sports duet can perform the final part of their programs in the final round [1; 3; 4; 7].

Increased requirements that currently apply to sports preparedness of athletes in Dance Sport and limited literature of this subject make it necessary to find new approaches to choice means of functional training of athletes at the stage of specialized basic training.

The purpose of the research:

the influence of step aerobics on indicators of physical development and functional preparedness athletes in Dance Sport on the stage of specialized basic training.

Research objectives:

1. Make analyze the literature on functional training of athletes in Dance Sport.
2. Identify the level of physical development and functional preparedness athletes in Dance Sport on the stage of specialized basic training.

3. Experimentally verify the impact of the step aerobics on indicators of physical development and functional preparedness athletes in Dance Sport on the stage of specialized basic training.

Material and Methods of the research

In the experiment took part 20 athletes (10 sports duets) aged 14–15 years who were divided into two groups: control (CG) and experimental (EG), for 5 sports duets in each. To achieve the objectives we used methods: theoretical – analysis and synthesis of scientific and methodological literature; pedagogical methods: pedagogical observation; pedagogical testing; medical and biological methods: anthropometry, functional methods of research; methods of mathematical statistics.

Results of the research and their discussion

At the beginning of the study, we have tested the girls and boys who are engaged in Dance Sport on the stage of specialized basic training. We evaluated indicators of physical development, a system of external breathing, parameters and cardiovascular system. The test results are shown in table 1.

Study anthropometric indicators in boys showed the following: the length of the body, muscle strength indicators on the results of carpal dynamometry match to the normal age, body weight below age norms; girls – the length of the body, muscle strength indicators on the results of carpal dynamometry and body weight – below age norms.

Table 1
Indicators of physical development and functional preparedness athletes at the start of the experiment (n=20)

No	Benchmarks		$\bar{X} \pm m$	S_x	CV, %
1	Body length, sm	girls	162,7±1,36	4,1	2,6
		boys	173,4±1,51	4,4	2,9
2	Body mass, kg	girls	48,93±1,47	4,40	8,9
		boys	56,55±2,71	8,14	14,3
3	Carpal dynamometry, kg	girls	22,65±0,75	2,25	9,9
		boys	38,30±1,40	4,21	11,9
4	Step test, st/un.	girls	63,4±1,5	4,4	17,1
		boys	65,7±1,4	3,3	19,6
5	VC, liters	girls	2910±60	170	28,6
		boys	3400±45	165	26
6	Stange, s	girls	44,2±1,6	2,9	20
		boys	55,3±1,8	3,1	18
7	Gincha, s	girls	29,6±1,2	3,5	10,4
		boys	33,9±1,3	2,9	14,1
8	RR, cycle/min	girls	19,4±0,6	1,6	8,2
		boys	19,1±0,9	1,4	7,6
9	Pulse, beats/min	girls	80,4±0,9	2,1	12
		boys	78,1±1,3	3,2	15,7

In indicators of cardiovascular system boys and girls have the following results:

The boys at the beginning of pedagogical experiment have average of group result of step test 65,7±3,3 st/un. This indicates that the boys at the beginning of the experiment have average indicator of operability. For individual characteristics 83% have average indicator, 17% has below the average indicator.

When assessing operability of girls have got average of group result of step test 63,4±4,4 st/un. This indicates that girls at the beginning of the experiment have below average indicator operability. For the individual characteristics: 66% have average indicator, 34% below the average indicator.

Heart rate of boys equal 78,1±3,2 beats/min; girls 80,4±2,1 beats/min, and point to normality indicator for children of this age. For the individual characteristics: 74% of girls have indicators which match to the norm, and 24% have higher than normal rates. In boys: 82% have indicator of norm and 18% have indicator above norm.

Also important in assessing the functional systems are indicators of external breathing.

In indicators of VC the girls have estimate below average 2910±170 liters. and require further development of this functional system. The boys have estimated the average level 3400±165 liters.

Testing determined that the absolute difference between the indicators of boys and girls is 490 ml.

The value of RR 19,4±1,6 (girls), 19,1±1,4 (boys) in girls and boys shows On the development of respiratory function in there. It is above adequate for children of this age.

According to the tests of holding breath following results:

In the sample Stange the average results of the girls were 44,2±2,9 s, the average results of the boys were 55,3±3,1 s.

Averages indicators in the sample Gincha, the girls were 29,6±3,5 s, boys were 33,9±2,9 s.

The values of parameters in functional tests Stange and Gincha boys and girls match age norm.

For coefficient of variation of dancers in the CG and the EG observed uniformity parameters in six tests (body length, body mass, carpal dynamometry test Gincha, RR, pulse) CV from 2,6% to 15,7%. In three tests (step test, VC, pulse) indicators of the average degree of uniformity, CV from 17,1% to 28,6%.

In order to improve functional training athletes in Dance Sport we proposed to introduce in the training process of dancers step aerobics means. On the basis indicators of physical development and operational functional readiness of athletes has been correction training loaded.

The control group continued training process as usual. In the process of training the experimental group at the end of the main part exercise classes added step aerobics: basic steps were performed with increasing amplitude and emphasis on correct technique movements. At that movements connected in simple combination or followed one another on the basis of a linear progression [6; 10]. We have not used turns and difficult moving around of the step platform. Load regulated so that the indicator of heart rate fluctuated within the target zone of moderate power. After the introduction of this method we conducted a retest. The results are shown in table 2.

Changes in body length and body mass indicators are not reliable in both groups studied athletes ($p > 0,05$). According to indicators of height in girls in CG increase was 1,4%, in EG was 1,2%. And in boys increase was: in CG 1,7%, and EG 1,6%. According to indicators of body mass in girls increase was 1,2% in CG and EG was 1,3%. In boys increase was: in CG

1,8%, in EG 1,9% ($p>0,05$).

Increase in indicators carpal dynamometry was: girls CG, 4,8%, boys, 2%; in EG: girls 10,5%, boys 9,9%.

After the introduction of methods with means step aerobics results Harvard step test have a positive trend. In EG group of girls increase was 8,7%, of boys 9,3%; in CG also discovered a positive trend: the result of girls increased on 3,4%, of boys 2,7%. In EG differences in results are significant at $p<0,01$ in boys and girls. In CG changes were not significant at $p>0,05$.

Dynamics of indicators of VC next: CG girls increase 4,3%, boys 2,3% ($p>0,05$). In EG parameters vital capacity increased, the increase amounted to 9,1% girls, 7,2% boys ($p<0,05$).

It's positive changed indicators of breath on inhalation and exhalation in both groups, but in group witch was engaged in the experimental method, indicators were better than in group which was engaged in the traditional method. So growth indicators in the sample Stange in CG were: girls 7%, boys 4,5% ($p>0,05$). In this figure increased EG: girls 9,5% to 9,3% of boys. In EG this significant changes at $p<0,05$.

In the sample Gincha in CG increase was: girls 7,8%, boys 6,5% ($p>0,05$). In experimental group the figure increased: girls 12%, boys 11,9%. In EG changes were significant at $p<0,05$.

In testing of respiratory rate growth indicators in CG were: girls 2,3%, boys 2,7 ($p>0,05$). In experimental group, the figure increased: girls 11,9%, boys 15,2%. In EG changes were significant at $p<0,05$.

The analysis of heart rate control group of athletes indicates little change: the girls increase was 2,3%, boys 1,3%. In experimental group, there have been more significant changes:

boys result increased on 4,8%, girls on 5,5%. Pulse rates of boys and girls of EG during the experiment have reliable differences ($p<0,05$), it's indicating of a significant shift and increase adaptive capacity of the organism boys and girls experimental group.

Conclusions

1. After analyzing the scientific and methodological literature we found that today in Dance Sport no scientifically based program of functional preparation athletes during long-term training. There are only a few studies on the different stages of long-term training. Not detected and use mean of step aerobics to improve the level of physical development and functional preparedness athletes.

2. The level of physical development and functional preparedness athletes at the stage of specialized basic training have this assessment: indicators of body length, body mass and carpal dynamometry are within the norm; operability indicators are below average; pulse parameters correspond to the norm for athletes of this age; VC indicators have evaluation below average; indicators tests at samples Stange and Gincha match age norm; RR below normal.

3. During the period of pedagogical experiment detected the positive impact of the step aerobics on indicators of physical development and functional preparedness athletes in Dance Sport on the stage of specialized basic training. Indicators of physical development were no significant changes, but have positive dynamics. According to indicators of body length girls in CG increase was 1,4% in EG 1,2%. And increase boys CG was 1,7%, and EG 1,6% ($p>0,05$). According to indicators of body mass girls increase were: in CG 1,2% and in EG 1,3%. The boys increase was: in CG 1,8%, in EG 1,9% ($p>0,05$). Increase of indicators carpal dynamometry in CG were: 4,8% girls, 2% boys; in EG girls 10,5% and boys 9,9%.

4. After the introduction of experimental methods there

Table 2
Comparative analysis of physical development and functional preparedness of athletes at the end of the experiment (n=20)

№	Benchmarks		Athletes before		CG after		$t_{\text{tabl}}=2,086$	p	EG after		$t_{\text{tabl}}=2,086$	p
			\bar{X}	m	\bar{X}	m			\bar{X}	m		
1	Body length, sm	girls	162,7	1,36	163,3	1,4	-0,36	>0,05	163,5	1,22	-0,50	>0,05
		boys	173,4	1,51	175,2	1,7	-1,00	>0,05	176,6	1,67	-1,79	>0,05
2	Body mass, kg	girls	48,93	1,47	48,2	1,2	0,45	>0,05	46,4	1,27	1,53	>0,05
		boys	56,55	2,71	55,2	1,8	0,64	>0,05	55,9	1,89	0,30	>0,05
3	Carpal dynamometry, kg	girls	22,65	0,75	23,8	0,9	-0,90	>0,05	25,3	0,46	-2,41	<0,05
		boys	38,3	1,4	39,4	1,5	-0,65	>0,05	42,2	0,9	-2,57	<0,05
4	Step test, st/un.	girls	63,4	1,5	64,9	1,4	-0,88	>0,05	69,4	1,7	-3,35	<0,01
		boys	65,7	1,4	67,5	1,3	-1,10	>0,05	72,4	1,6	-3,86	<0,01
5	VC, liters	girls	2910	60	3040	57	-1,20	>0,05	3200	64	-2,60	<0,05
		boys	3400	45	3480	50	-0,82	>0,05	3623	46	-2,30	<0,05
6	Stange, s	girls	44,2	1,6	47,5	1,7	-1,82	>0,05	48,8	1,4	-2,66	<0,05
		boys	55,3	1,8	57,8	1,6	-1,36	>0,05	60,3	1,7	-2,67	<0,05
7	Gincha, s.	girls	29,6	1,2	32,4	1,3	-1,77	>0,05	33,5	1,3	-2,47	<0,05
		boys	33,9	1,3	36,2	1,4	-1,40	>0,05	38,1	1,5	-2,51	<0,05
8	RR, cycle/min	girls	19,4	0,6	19	0,7	0,35	>0,05	17,1	0,5	2,19	<0,05
		boys	19,1	0,9	18,6	0,8	0,38	>0,05	16,2	0,8	2,22	<0,05
9	Pulse, beats/min	girls	80,4	0,9	78,2	0,8	1,69	>0,05	76,8	0,7	2,85	<0,05
		boys	78,1	1,3	77,1	1,4	0,61	>0,05	74,4	0,9	2,49	<0,05

have been more significant changes of functional preparedness in EG at $p < 0,05$ and $p < 0,01$ and in CG not significant at $p > 0,05$.

The prospects for further research. Further research will

be aimed at improving the functional preparedness of athletes in Dance Sport on the next stage long-term preparation by including in the training process special means sports aerobics aimed at developing cardiovascular and respiratory systems.

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