

TECHNIQUE OF DEVELOPMENT OF SPECIAL ENDURANCE

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ABSTRACT

In presented article the variant of construction of training process and stable performance of technically difficult elements developments demanding a maximum level in gymnasts not only leading physical abilities, but also special and general endurance is considered.

Keywords: The competitive activity, special endurance, stability, gymnastic exercises, the correlation analysis.

URGENCY

The sharp intensification of competitive activity and intensity of training process became the basic tendencies of development of gymnastic disciplines last years. Accordingly on the foreground there is a necessity to form at gymnasts stable and reliable skills of execution. According to I.A.Viner (2003) for stable performance of technically difficult elements the maximum level of development in gymnasts not only leading physical abilities, but also special and general endurance is required. Special value gets endurance at performance of group exercises in gymnastic disciplines as the density and quantity of elements increases in a competitive composition that demands high functional preparation [1,2].

Given article will serve in certain degree to realisation of the problems put in the Law of Republic Uzbekistan «About physical training and sports» (2015), decrees of the President of Republic Uzbekistan: «About measures on the further development of physical training and mass sports», «Strategy on the further development of Republic Uzbekistan» (2017).

The research problem: To study structure and criteria of an estimation of indicators of special endurance in art, aesthetic gymnastics and sports aerobics.

The organisation of researches: For researches three gymnastic kinds of sports have been chosen: aesthetic gymnastics, art gymnastics and sports aerobics, - the kinds of sports similar on conditions of carrying out of competitions and presence of competitions in groups.

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As a result of the analysis of videorecordings of competitions it is noted statistically authentic ($r \geq 0,05-0,01$) increase in the general share of errors in a final part of the program without dependence from level of competitions and sports kind.

- In a final part of a composition at sportswomen in art gymnastics the number of errors increases at performance of elements by a body and a subject (up to its loss);

- In aesthetic gymnastics - in a finishing part of the program the number of the errors connected with infringement of synchronism, and technics of performance of supports and pyramids increases;
- On sports aerobics the increase in quantity of errors in the technician of elements is marked.

The greatest number of errors in sports views of gymnastics with the account, both quantities, and essence, is supposed in a final part of the competitive program that can be a consequence of exhaustion of sportswomen and result of insufficient development of special endurance that confirms an urgency of research [3].

Studying of structure and kinds of special endurance was a problem of a following stage. In the scientifically-methodical literature it is possible to meet characteristics of many forms of display of endurance. The term «special endurance of the sportsman» means ability to resist to exhaustion in the conditions of specific loadings, especially at the maximum mobilisation of functionality of an organism for object in view achievement in the selected kind of sports.

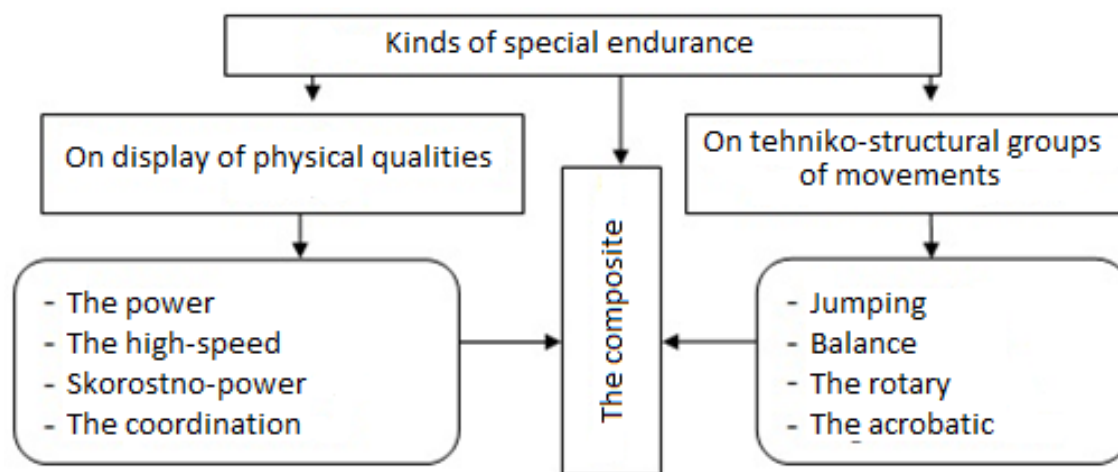


Fig. 1. Structure of kinds of special endurance

The analysis corrected competitions and questioning of experts has allowed to generalise the obtained data in a question on kinds of special endurance in gymnastic disciplines and schematically to unite them on physical qualities on the one hand, and on groups of movements with another [4]. An integrated indicator of special endurance is "composite" endurance. "Composite" endurance in gymnastic disciplines includes прыжковые, equilibrium, rotary and acrobatic groups of the movements, which performance is possible at optimum-balanced development power, high-speed, skorostno-power and coordination abilities (fig. 1).

Results of data of the special literature, pedagogical supervision and interrogation of experts have allowed to allocate indicators of a level of development of special endurance in gymnastic kinds of sports and to unite them in the uniform scheme (fig. 2).

For reception of an objective estimation of a level of development of special endurance of gymnasts it is important to define tests for studying of kinds of special endurance on display of physical qualities: power, high-speed, skorostno-power, coordination, and on groups of movements: прыжковой, equilibrium, rotary and acrobatic endurance. Thus, for an estimation of power endurance the test «Bending and разгибание hands from an emphasis laying» for girls of 17-19 years has been used; for an estimation of static and dynamic power

endurance tests "Fold" and «Lateral balance» were used, «прыжковая» endurance was defined under the test "Double" jumps through a skipping rope, "equilibrium" - under the test «Пасце»; high-speed endurance was defined under the test «К-400». Tests «Фузте» for an estimation of "rotary" endurance, the test for definition of coordination endurance and tests «Лодочка» and «Разножка», "Cobra" for definition of skorostno-power endurance have been developed during research.

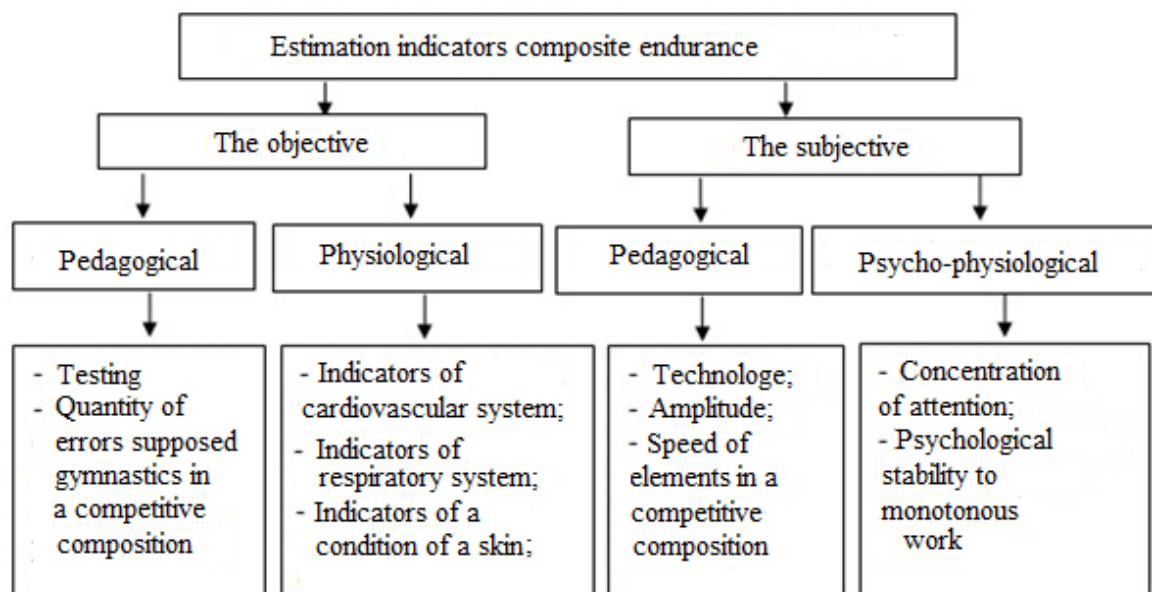


Fig. 2. Indicators of special endurance in gymnastic disciplines

At definition информативности used tests, we have compared indicators of development of special endurance with an average estimation of readiness of gymnasts to competitions. Readiness was estimated by gymnasts and their trainers (consisted of an estimation of readiness and quality of performance) on двадцатибалльной to a scale by results of the spent control trainings with the subsequent conclusion of an average index. 30 sportswomen of a national team of Russia have taken part in research. Testing was spent in the end of the preparatory period of the year period of учебно-training process (tab. 1).

**Table 1: Comparison of data of a level of development of special endurance
With success of performance of gymnasts at competitions (M±m)**

Endurance kinds	Tests	Readiness for competitions		t	P
		The good (n=12)	The satisfactory (n=18)		
The power	«Bending and extension hands from an emphasis laying» (quantity of times)	13 ± 1,2	14±1,1	0,61	P>0,05
	« Fold » (quantity of times)	20 ± 2,1	22 ± 1,5	0,74	P>0,05
	«Lateral balance» (s)	54 ± 7,2	35 ± 2,0	2,52	P≤0,05
	«Cobra» (s)	193 ± 21,8	184 ± 15,7	0,33	P>0,05
The high-speed	K-400 (s)	19,9± 0,9	20,8 ± 0,2	0,2	P>0,05
Skorostno-power	« The defference» 4th approach (quantity of times)	15,0 ± 0,3	14,0 ± 0,3	2,04	P≤0,05
	«boat»	16,0 ± 0,1	15,0 ± 0,2	3,24	P≤0,01

	4th approach (quantity of times)				
The coordination	The test (quantity of times)	3,0 ± 0,4	3,0 ± 0,1	0	P>0,05
«Hopping»	«Double jumps» (quantity of times)	92 ± 1,9	88 ± 1,9	1,48	P>0,05
«The equilibrium »	«passe» (s)	74 ± 6,1	37 ± 2,3	5,66	P≤0,001
« The rotary»	«Foot» (quantity of times)	18 ± 2,7	24 ± 2,2	1,71	P>0,05
«The acrobatic»	«Acrobatic complex» (quantity of times)	13 ± 1,8	7 ± 0,4	3,12	P≤0,01
In work as a subject the «Subject »	Maces (quantity of times)	27±5,6	35±3,8	1,17	P>0,05
	Tape (s)	105±6,8	81±4,1	2,99	P≤0,01
	Hoop (quantity of times)	20±1,9	19±1,5	0,4	P>0,05
	Ball (quantity of times)	36±3,8	33±2,6	0,64	P>0,05

It is revealed, that in group of gymnasts with good readiness to competitions statistically authentically best development of power static endurance of muscles of feet, skorostno-power endurance of muscles of a back and feet, also "equilibrium" and "acrobatic" endurance (is defined at $p \leq 0,01 - 0,001$). The received results are confirmed and at calculation of factor of correlation Пирсона.

For studying of indicators of special endurance of a functional condition of sportswomen of art, aesthetic gymnastics and sports aerobics testing has been held. All sportswomen had high sports qualification (KMC and MC), research was spent to the preparatory period of a training cycle. Middle age of sportswomen of art gymnastics (ХГ) - 17,1±0,3 years; aesthetic gymnastics (ЭГ) - 18,4±0,2 years; sports aerobics (СА) - 19,3±0,2 years.

It is established, that at sportswomen of sports aerobics the greatest development has «dynamic power» endurance of muscles of hands and an abdominal tension. At sportswomen of art gymnastics endurance of muscles of feet and "equilibrium" endurance with strongly pronounced asymmetry between execution by the right and left foot (5,6) is is better developed «static power».

At sportswomen in aesthetic gymnastics decrease систолического and minute volume, against less expressed prevalence of exciting influences in activity of vegetative nervous system is marked.

Studying of indicators of special endurance at leading sportswomen in group and individual exercises on art gymnastics was important. Endurance testing was spent on 5 gymnasts occupying prize-winning places in the championship of Uzbekistan (3 MC and 2 KMC) in individual superiority and 6 gymnasts of an alternating cast of a national team of Uzbekistan in group exercises (2 MK and 4 KMC) (tab. 2).

**Table 2: Indicators of special endurance at leading sportswomen
In group and individual exercises On art gymnastics (M ± m)**

Endurance kinds	Tests	The individual (n = 5)	The group (n = 6)	t	P
I. On display of physical qualities					
The dynamic power	Bending and defference hands from an emphasis laying»(quantity of times)	10,2±2,2	29,8±2,67	5,6	P≤0,001
	« Fold » (quantity of times)	18,2±2,8	31,0±3,3	2,9	P≤0,05
The static	«Cobra» (s)	101,2±24,0	216,8±24,2	1,96	P>0,05
	«Lateral balance» on left (s)	40,8±2,0	94,0±8,5	6,1	P≤0,001
	Lateral balance» on right	36,8±7,0	51,0±10,8	1,1	P>0,05
Skorostno-power	« The defference» 4th approach (quantity of times)	16,4±0,2	20,0±0,8	4,2	P≤0,01
	«boat» 4th approach (quantity of times)	14,4±0,8	15,5±0,5	1,16	P>0,05
The coordination	The test (quantity of times)	3,0±0,7	3,9±0,3	1,15	P>0,05
II. On tehniko-structural groups of movements					
«Hopping»	«Double jumps» (quantity of times)	80,0±10,0	98,2±2,5	1,76	P>0,05
«The equilibrium »	«passe» on right (s)	91,0±26,0	65,0±10,8	0,92	P>0,05
	«passe» on left (c)	78,0±19,0	96,3±15,0	0,76	P>0,05
« The rotary»	«Foot» on right (quantity of times)	19,4±1,8	25,2±2,17	2,05	P>0,05
	«Foot» on left (quantity of times)	15,2±2,6	36,7±3,5	4,92	P≤0,001
«The acrobatic»	«Acrobatic complex» (quantity of times)	11,2±3,4	10,8±2,5	0,1	P>0,05

At the comparative analysis of indicators it is established, that at the gymnasts acting in group exercises, special value in comparison with sportswomen of individual programs has development of power and skorostno-power endurance, "rotary" and coordination endurance. The obtained data not only reflect features of requirements to development of kinds of special endurance in the gymnasts acting in individual and group programs, but also can serve as a reference point for trainers as are received at inspection of the best gymnasts.

As a result of basic researches it was possible to receive the generalised data on an orientation, quantity and duration of trainings in gymnastic disciplines, to establish level of loadings used by trainers and intensity of employment which influence development and perfection of special endurance in each period of a year cycle. The general analysis of physical activities applied in a year training cycle has shown, that shock loadings in the work are used more often by trainers on sports aerobics, and optimum loadings are equally used by trainers in all

considered disciplines. In the preparatory period trainers basically use optimum loadings, in the competitive period shock loadings, and in transitive - unloading and moderated prevail, and shock loadings are used by trainers on sports aerobics (tab. 3) more often.

**Table 3: Size of training loadings in gymnastic disciplines
In a year cycle of uchebno-training process (According to interrogation of experts)**

The period of a training cycle	Loadings	Art gymnastics (n=19)		Aesthetic gymnastics (n=21)		Sports aerobics (n=23)	
		n	%	n	%	n	%
The preparatory	drums	–	–	–	–	4	17,4
	The optimum	11	57,9	11	52,4	11	47,8
	The moderated	8	42,1	10	47,6	6	26,3
	The unloading	0	–	–	–	2	8,7
The competitive	drums	10	50,6	10	47,6	10	43,5
	The optimum	6	33,8	8	38,1	9	39,1
	The moderated	3	15,8	3	14,3	4	17,4
The transitive	drums	–	–	–	–	4	17,4
	The optimum	3	15,8	4	19,1	6	26,1
	The moderated	7	36,8	10	47,6	8	34,8
	The unloading	9	47,4	7	33,3	5	21,7

The analysis of loadings has shown, that in the preparatory period the majority of trainers of all disciplines is spent by trainings with optimum loadings, in the competitive period shock loadings, and in transitive - unloading and moderated prevail. It is necessary to notice, that trainings with shock loadings are spent in sports aerobics more often.

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