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Dynamics of general and specially trained of women-weightlifters at the stage of specialized basic training

Abstract. Purpose: to determine the dynamics of the general and special training of women-weightlifters different groups weight categories for annual macrocycle at the stage of specialized basic training. **Materials and Methods:** indexes long jump, running 30 meters, push-ups, jumps on how Abalakova index and wrist strength athletes different schools of Ukraine. **Results:** found dynamic indicators of general and special training of women-weightlifters different groups weight categories at the stage of basic training six specialized schools in Ukraine. **Conclusions:** the results of the study provide an opportunity to consider certain indicators in planning differentiated training programs to improve the training process athletes for women-weightlifters at the stage of specialized basic training different groups weight categories in the annual macrocycle.

Keywords: dynamometry, jump, load, stage of preparation, training, weight category, women-weightlifter.

Introduction. The analysis of scientifically methodical literature indicates the relevance of the research of training of women in weightlifting today [3; 6].

Many researches of training of women in weightlifting concerned women weightlifters of high qualification or initial preparation [1; 3; 8]. The small attention is paid to the research of women weightlifters at the stage of the specialized basic preparation.

Certain indicators of the general and special preparedness in the creation of preparation of women weightlifters of different groups of weight categories are defined and taken into consideration in the branch of weightlifting sport definitely [3; 8].

However there are no researches concerning dynamics of indicators of the general and special preparedness of women weightlifters at the stage of specialized basic preparation during an annual macrocycle at different weightlifting schools of Ukraine.

The accounting of dynamics of the level of these indicators will give the chance to rationalize the creation of training loads of women weightlifters taking into account group differences at the noted stage of long-term preparation.

Therefore there is an important scientific and practical task: definition of dynamics of indicators of the general and special preparedness of women weightlifters of three groups of weight categories of different weightlifting schools of Ukraine at the stage of specialized basic preparation.

In weightlifting the problem of modeling of indicators of preparedness of weightlifters of different sex was investigated and studied by many experts [1; 4; 12].

In particular, dynamics of indicators of physical development, physical and technical fitness of women weightlifters of 12–15 years old was defined. The interrelation size between indicators of physical development, the general and special preparedness of young women weightlifters of different groups of weight categories is specified. It is established that indicators of the general and special preparedness grow with the increase of groups of weight categories on average for 18,2 and 40,8% [3; 6].

Also model indicators of an explosive force of muscles of feet of sportsmen of high qualification of different sex were defined. Besides, S. Putsov defined the dynamics of indicators of high-speed and power preparedness of women weightlifters of high qualification depending on groups of weight categories, and also the dynamics of indicators of height of a jump of women weightlifters of high qualification was defined during the competitive and preparatory periods [8].

However the vast majority of researches concern women weightlifters of high qualification or beginners.

In our opinion, and also according to some authors, planning of training loads and creation of training of sportsmen need to be carried out taking into account specific and group features of different sections of preparedness at the stage of the specialized basic preparation [2; 7; 11].

Therefore it is necessary to define dynamics of indicators of the general and special preparedness of sportswomen during a preparation macrocycle of women weightlifters of 16-18 years old which are at the stage of the specialized basic preparation.

Communication of the research with scientific programs, plans, subjects. The work is performed within a scientific subject 2.6. "Theoretic-methodical bases of the improvement of training process and the competitive activity in the structure of long-term training of sportsmen" the Built plan of the research work in the sphere of physical culture and sport for 2011-2015. Ministry of Education, Sciences, Youth and Sport of Ukraine (number of the state registration is 0106U012613).

Thus, **the purpose of our research** is the definition of dynamics of indicators of the general and special preparedness of women weightlifters of different groups of weight categories during an annual macrocycle at the stage of the specialized basic preparation.

Material and methods of the research: theoretical analysis and generalization; pedagogical supervision; testing of indicators of the general physical fitness; testing of indicators of special physical fitness by means of techniques of Abalakov and hand dynamometry; methods of mathematical statistics [9; 10].

The research of dynamics of indicators of the general preparedness (a long jump, run of 30 m and press-up), indicators of special preparedness (a high jump by the technique of Abalakov and an index of hand force) of 54 sportswomen of three groups of weight categories of six weightlifting schools of Ukraine was conducted during a preparation macrocycle.

Results of the research and their discussion. Indicators of a long jump, run of 30 m, press-up, a high jump by the technique Abalakov and an index of hand force of 54 women weightlifters of six weightlifting schools of Ukraine were defined for the detection of features of dynamics of indicators of the general and special preparedness of women weightlifters at the stage of the specialized basic preparation (Ternopol, Kharkiv, Donetsk, Kherson, Rovno and Zaporozhye). Testing happened due to the known techniques in the beginning and at the end of an annual macrocycle of preparation [5]. Each of schools trained at the system of preparation in a macrocycle with different quantity of cycles of preparation and starts.

Analysis of dynamics of indicators of the general and special preparedness of women weightlifters of three groups of weight categories (I group of 48-58 kg; II group – 63–69 kg; III group – 75–75+ kg) of different weightlifting schools of Ukraine gives the chance to draw intermediate conclusions of our research concerning the efficiency of creation of the system of preparation of this or that weightlifting school during a preparation macrocycle at the stage of the specialized basic preparation. And also women weightlifters of 16-18 years old of different groups of weight categories gives information concerning differences of dynamics of the noted indicators. The comparative analysis of indicators of the general preparedness of women weightlifters testifies to reliable differences of indicators of sportswomen of different groups of weight categories of six weightlifting schools at the beginning of a macrocycle of preparation (tab. 1).

Table 1

Dynamics of indicators of the general preparedness of women weightlifters of different groups of weight categories (n=54)

Groups h/q	Long jump (% of growth)		Run of 30 m (s)		Press-up (times)		Long jump (% of growth)		Run of 30 m (s)		Press-up (times)	
	In the beginning of macrocycle						At the end of macrocycle					
	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$
I	123,0	3,12	5,2	0,21	37,4	3,25	125,1	3,19	5,0	0,18	39,9	4,27
II	128,5	5,88	5,2	0,21	38,1	3,29	130,3	5,59	5,1	0,18	40,4	3,89
III	127,2	6,39	5,6	0,22	28,8	2,02	129,7	5,02	5,3	0,22	30,8	3,32
p1*	<0,05		>0,05		>0,05		<0,05		>0,05		>0,05	
p2**	>0,05		<0,05		<0,05		>0,05		<0,05		<0,05	
p3***	<0,05		<0,05		<0,05		<0,05		<0,05		<0,05	

Note. * – reliability of differences between I and II groups of weight categories by t-criterion of Student; ** – reliability of differences between II and III groups of weight categories by t-criterion of Student; *** – reliability of differences between I and III groups of weight categories by t-criterion of Student.

In particular, sportswomen of I group of weight categories own the lowest indicator in a long jump ($123,0 \pm 3,12\%$ of growth). The indicator of II groups of weight categories is higher for 5,5% of growth than the indicator of I group. The indicator of III group is also higher than the indicator of I group and makes $-127,2 \pm 6,39\%$ of growth. Reliable differences between the indicators of II and III groups aren't established (tab. 1).

In the indicator of run on 30 m sportswomen of III group of weight categories own the lowest indicator ($5,6 \pm 0,22$ s) that is predetermined by the greatest own body weight of representatives of this group of weight categories. Sportswomen of I and II groups of weight categories own the identical indicators which make $5,2 \pm 0,21$ s (tab. 1).

The similar tendency is observed at press-ups where also sportswomen of III groups of weight categories own the lowest indicator ($28,8 \pm 2,02$ s). The reliable differences aren't revealed between indicators of sportswomen of I and II groups of weight categories (tab. 1).

The similar tendency in differences of indicators of women weightlifters of different groups of weight categories is observed at the end of a macrocycle of preparation (tab. 1).

The indicator gain makes a long jump at women weightlifters at the stage of the specialized basic preparation during a macrocycle of preparation in I group of weight categories – 2,1% of growth of a body ($p < 0,05$), in II group of weight categories – 1,8% of growth of a body ($p < 0,05$) and in III group of weight categories – 2,5% of growth of a body ($p < 0,05$).

The gain of indicators of I group of weight categories – makes 0,2 s ($p < 0,05$), in II group of weight categories – 0,1 s ($p < 0,05$) and in III group of weight categories – 0,3 s ($p < 0,05$) in run on 30 m of women weightlifters at the stage of the specialized basic preparation during a macrocycle of preparation.

The indicators of press-up of women weightlifters grew in I group of weight categories on 2,5 times ($p < 0,05$), in II group of weight categories on 2,3 times ($p < 0,05$) and on 2,0 times – in III group of weight categories ($p < 0,05$) at the stage of the specialized basic preparation during a macrocycle of preparation.

Also we defined the dynamics of indicators of special preparedness of women weightlifters of different groups of weight categories during a preparation macrocycle.

In particular, the indicator of women weightlifters of I group of weight categories at the beginning of a macrocycle of preparation made $36,4 \pm 3,50$ sm from growth, and at the end of a macrocycle – $41,0 \pm 4,78$ sm in a jump by the test of Abalakov. The reliable gain makes 4,6 sm ($p < 0,01$). The indicators of women weightlifters of II group of weight categories made $40,6 \pm 5,82$ sm at the beginning of a macrocycle of preparation, and at the end of a macrocycle – $45,1 \pm 6,25$ sm.

The indicator of this group of weight categories is authentically higher, than at women weightlifters of I group of weight categories. The gain of II group of weight categories makes 4,5 sm ($p < 0,01$). The jump indicator of women weightlifters of III group of weight categories made $42,4 \pm 3,53$ cm, and at the end of a macrocycle – $45,8 \pm 3,47$ sm at the beginning of a preparation macrocycle. The indicator of this group of weight categories is authentically higher only than the indicator of women weightlifters of I group of weight categories is. The gain of III group of weight categories makes 3,4 sm ($p < 0,01$) (tab. 2).

Table 2

Dynamics of indicators of special preparedness of women weightlifters of different groups of weight categories (n=54)

Groups h/q	Test of Abalakov (sm)		Index of hand force (s.u.)		Test of Abalakov (sm)		Index of hand force (s.u.)	
	In the beginning of macrocycle				At the end of macrocycle			
	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$
I	36,4	3,50	75,0	6,00	41,0	4,78	78,3	6,18
II	40,6	5,82	59,0	5,22	45,1	6,25	62,3	5,77
III	42,4	3,53	56,4	3,66	45,8	3,47	59,1	3,62
p1*	<0,05		<0,05		<0,05		<0,05	
p2**	>0,05		>0,05		>0,05		<0,05	
p3***	<0,05		<0,05		<0,05		<0,05	

Note. * – reliability of differences between I and II groups of weight categories by t-criterion of Student; ** – reliability of differences between II and III groups of weight categories by t-criterion of Student; *** – reliability of differences between I and III groups of weight categories by t-criterion of Student.

The tendency to big indicators of women weightlifters with the growth of weight categories is observed.

However the reliable indicators of the gain during a preparation macrocycle are found in all groups of weight categories of women weightlifters. Dynamics of indicators of the index of hand force of women weightlifters is established during an annual macrocycle of preparation at the stage of the specialized basic preparation.

Indicators of the index of hand force of women weightlifters of I group of weight categories made $75,0 \pm 6,00$ s.u. at the beginning of a macrocycle of preparation, and at the end of a macrocycle – $78,3 \pm 6,18$ s.u. The gain made 3,3 s.u. ($p < 0,01$). The index of hand force of women weightlifters of II group of weight categories made $59,0 \pm 5,22$ s.u. at the beginning of a macrocycle of preparation, and at the end of a macrocycle – $62,3 \pm 5,77$ s.u. The indicator of this group of weight categories is reliable below, than at women weightlifters of I groups of weight categories that is opposite to a tendency of indicators of a high jump. The gain of indicators of the index of hand force of II group of weight categories makes 3,3 s.u., as well as at women weightlifters of I groups of weight categories ($p < 0,01$). The lowest indicators of the index of hand force is defined at women weightlifters of III group of weight categories at the beginning of a preparation macrocycle – $56,4 \pm 3,66$ s.u. but at the end of a macrocycle – $59,1 \pm 3,62$ s.u. The reliable gain of the index of hand force makes 2,7 s.u. ($p < 0,01$) during a preparation macrocycle of women weightlifters of this group of weight categories behind nonparametric T-criterion of Vilkokson (tab. 2). Here the opposite tendency is observed in comparison with indicators of a high jump. The highest indicators of the index of hand force of women weightlifters of the lowest weight categories are established in comparison with sportswomen of II and III groups of weight categories.

Also we investigated the dynamics of indicators of special preparedness of women weightlifters of different groups of weight categories of six weightlifting schools of Ukraine at the stage of the specialized basic preparation during a macrocycle of preparation (tab. 3).

Table 3

Dynamics of indicators of special preparedness of women weightlifters of different weightlifting schools of Ukraine (n=54)

Testing	Weightlifting schools												Groups h/q
	Ternopol		Kharkiv		Kherson		Donetsk		Rovno		Zaporozhye		
	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	\bar{X}	$\pm\sigma$	
In the beginning of macrocycle													
1- High jump (sm)	38,3	1,53	39,7	1,53	32,3	2,52	38,7	2,08	32,3	2,52	37,0	3,00	I*
2- Index of hand force (s.u.)	67,3	1,78	78,8	4,18	78,7	6,11	74,9	4,92	71,3	2,80	78,7	4,80	
1- High jump (sm)	49,7	1,53	36,3	3,21	37,0	2,00	46,0	2,00	37,0	1,00	37,3	5,86	II**
2- Index of hand force (s.u.)	60,6	2,81	63,1	2,22	53,4	6,18	62,3	1,32	56,7	2,48	57,7	6,90	
1- High jump (sm)	45,3	0,58	37,0	3,46	41,3	2,08	46,3	1,15	43,7	2,52	41,0	1,00	III***
2- Index of hand force (s.u.)	54,8	2,23	58,7	2,21	56,1	1,69	52,3	3,52	58,2	2,74	58,1	4,80	
At the end of macrocycle													
1- High jump (sm)	45,7	1,53	46,0	2,65	36,0	1,00	44,3	2,52	35,3	1,53	38,7	2,52	I*
2- Index of hand force (s.u.)	72,2	2,15	83,2	5,27	79,6	6,25	80,5	5,42	72,8	2,56	81,2	5,60	
1- High jump (sm)	55,0	1,00	43,7	2,89	40,0	1,73	51,3	1,53	40,7	0,58	40,0	4,58	II**
2- Index of hand force (s.u.)	64,2	1,73	67,2	1,98	55,1	5,48	68,1	1,63	59,2	2,64	59,9	5,85	
1- High jump (sm)	49,3	1,53	41,3	0,58	43,3	1,53	50,3	2,08	46,0	2,65	44,3	0,58	III***
2- Index of hand force (s.u.)	57,4	1,80	61,7	2,28	58,6	1,28	56,2	4,11	61,1	2,98	59,6	5,21	
1	7,4		6,3		3,7		5,6		3,0		1,7		I* gain
2	4,9		4,4		0,9		5,6		1,5		2,5		
1	5,3		7,4		3,0		5,3		3,7		2,7		II** gain
2	3,6		4,1		1,7		5,7		2,5		2,2		
1	4,0		4,3		2,0		4,0		2,3		3,3		III*** gain
2	2,6		3,0		2,5		3,9		2,9		1,5		

Note. * – I – group of easy weight categories (48, 53, 58 kg); ** – II – group of average weight categories (63, 69 kg); *** – III – group of heavy weight categories (75, 75+ kg).

In particular, the reliable highest indicators of the gain of a high jump at sportswomen of the first group of weight categories are established at Ternopol school (from $38,3 \pm 1,53$ sm at the beginning of a macrocycle to $45,7 \pm 1,53$ sm at the end of a preparation macrocycle), at Kharkiv school (from $39,7 \pm 1,53$ sm at the beginning of a macrocycle to $46,0 \pm 2,65$ sm at the end of a macrocycle) and Donetsk school (from $38,7 \pm 2,02$ sm at the beginning of a macrocycle to $44,3 \pm 2,52$ sm at the end of a macrocycle); the second group of weight categories in Kharkiv (from $36,3 \pm 3,21$ sm at the beginning of a macrocycle to $43,7 \pm 2,89$ sm at the end of a macrocycle), Ternopol (from $49,7 \pm 1,53$ sm at the beginning of a macrocycle to $55,0 \pm 1,00$ sm at the end of a macrocycle) and Donetsk schools (from $46,0 \pm 2,00$ sm at the beginning of a macrocycle to $51,3 \pm 1,53$ sm at the end of a macrocycle) and the third groups of weight categories in Kharkov (from $37,0 \pm 3,46$ sm at the beginning of a macrocycle to $41,3 \pm 0,58$ sm at the end of a macrocycle), Ternopol (from $45,3 \pm 0,58$ sm at the beginning of a macrocycle to $49,3 \pm 1,53$ sm at the end of a macrocycle) and Donetsk schools (from $46,3 \pm 1,15$ sm at the beginning of a macrocycle to $50,3 \pm 2,08$ sm at the end of a macrocycle) (tab. 3).

The highest gain of indicators of the index of hand force is also established authentically at sportswomen of the first group of weight categories at Donetsk school (from $74,9 \pm 4,92$ s.u. at the beginning of a macrocycle to $80,5 \pm 5,42$ s.u. at the end of a macrocycle), Ternopol school (from $67,3 \pm 1,78$ s.u. at the beginning of a macrocycle to $72,2 \pm 2,15$ s.u. at the end of a macrocycle) and Kharkov school (from $78,8 \pm 4,18$ s.u. at the beginning of a macrocycle to $83,2 \pm 5,27$ s.u. at the end of a macrocycle); the second group of weight categories at Donetsk school (from $62,4 \pm 1,32$ s.u. at the beginning of a macrocycle to $68,1 \pm 1,63$ s.u. at the end of a macrocycle), Ternopol school (from $60,6 \pm 2,81$ s.u. at the beginning of a macrocycle to $64,2 \pm 1,73$ s.u. at the end of a macrocycle) and Kharkov school (from $63,1 \pm 2,22$ s.u. at the beginning of a macrocycle to $67,2 \pm 1,98$ s.u. at the end of a macrocycle) and the third groups of weight categories at Donetsk school (from $52,3 \pm 3,52$ s.u. at the beginning of a macrocycle to $56,2 \pm 4,11$ s.u. at the end of a macrocycle) (tab. 3). The lowest indicators of the index of hand force at representatives of weightlifting categories predetermined by that calculation given to parameter is carried out in standart units taking into account own body weight.

Therefore, the dynamics of indicators of the general preparedness, and also special preparedness of women weightlifters of different groups of weight categories at the stage of the specialized basic preparation of six weightlifting schools of Ukraine is installed by means of the known techniques. It gives the chance to consider certain indicators when planning of the differentiated programs of preparation of women weightlifters at the stage of the specialized basic preparation of different groups of weight categories in an annual macrocycle.

Conclusions:

1. The dynamics of indicators of the general and special preparedness of 54 women weightlifters at the stage of the specialized basic preparation of different groups of weight categories is defined by means of testing. The indicators of a long jump, run on 30 m, press-up, a high jump and the index of hand force are systematized, analysed and generalized in an annual macrocycle of preparation of women weightlifters.

2. It is established that the gain of indicators of a long jump of women weightlifters makes 2,1% ($p < 0,01$) in I group of weight categories, 1,8% ($p < 0,01$) in II group of weight categories and 2,5% ($p < 0,01$) in III group of weight categories at the stage of the specialized basic preparation during a macrocycle of preparation (tab. 1).

The gain of indicators of women weightlifters makes 0,2 s ($p < 0,05$) in I group of weight categories, 0,1 s ($p < 0,05$) in II group of weight categories and 0,3 s ($p < 0,05$) in III group of weight categories in run on 30 m at the stage of the specialized basic preparation during a macrocycle of preparation.

The indicators of press-up of women weightlifters grew on 2,5 times ($p < 0,05$) in I group of weight categories, on 2,3 times ($p < 0,05$) in II group of weight categories and on 2,0 times – in III group of weight categories ($p < 0,05$) at the stage of the specialized basic preparation during a macrocycle of preparation.

3. We defined the dynamics of indicators of special preparedness of women weightlifters of different groups of weight categories during a preparation macrocycle.

In particular, the indicator gain in a jump behind Abalakov of women weightlifters of I group of weight categories makes 4,6 sm. The indicators of women weightlifters of II group of weight categories have the gain 4,5 sm. The jump indicator of women weightlifters of III group of weight categories has the reliable gain 3,4 sm ($p < 0,01$) (tab. 2).

The gain of indicators of the index of hand force of women weightlifters of I group of weight categories made 3,3 s.u. The gain of indicators of the index of hand force of II group of weight categories makes 3,3 s.u., as well as at women weightlifters of I group of weight categories. The lowest indicators of the index of hand force

are defined at women weightlifters of III group of weight categories and behind nonparametric T-criterion of Vilkokson – 2,7 s.u. ($p < 0,01$) (tab. 2).

4. The dynamics of indicators of special preparedness of women weightlifters of different groups of weight categories of six weightlifting schools of Ukraine is established at the stage of the specialized basic preparation during a macrocycle of preparation (tab. 3).

The subsequent researches will be directed on the definition of interrelation between indicators of the general and special preparedness and components of loading of women weightlifters of different groups of weight categories at the stage of the specialized basic preparation at different weightlifting schools of Ukraine by means of the correlation analysis.

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