

INFLUENCE OF THE EXPERIMENTAL PROGRAM OF TRAININGS IN ARMSPORT ON THE POWER INDEXES OF BASIC MUSCLE GROUPS OF 16-17-YEARS-OLD ARMWRESTLERS

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Annotation. The features of influence of the experimental program of trainings are considered in armsport. The program is developed taking into account age-dependent changes in the organism of young sportsmen, features of development of force and power endurance, structure of long-term preparation. The program is directed on development of force and static power endurance of basic muscle groups of sportsmen. In researches took part 30 sportsmen aged 16-17 years old. It is set that the stage of the specialized base training is foreseen by the increase of time on perfection of technique of fight at the table to 15 %. The special attention must be spared the special physical youth development. The block of the specialized training to send to development of explosive force, workings of weak corners, change of character of work is recommended. It is set that trainings with the static loadings are obligatory and in the general volume of loadings must make no less than 20 %. It is necessarily necessary to plan the block of the restoration training for physical and psychological renewal of sportsmen after the conducted setup time and appearance on competitions, exposure and comprehension of sufferet errors and search of methods of their removal.

Keywords: armsport, macrocycle, static, endurance, force.

Introduction.

Modern arm wrestling has a power character, but in fact the manifestation of qualities is speed-strength sport. At the same time, the role of technical and tactical training to achieve results in competitions, approaching struggle. Thus, the idea of strength, speed-strength qualities directly linked with the fight on his hands.

For armwrestling, like all sports, is characterized striving for maximum achievement. Adding to senior figures in armwrestling implemented using appropriate construction of sports training, use of the most effective and efficient means and methods of deep long and year-round training [7-10, 13, 14].

In the scientific and technical literature, planning, programming training process taught in a discussion of options training athletes. Therefore, based on age-related changes in the body of young athletes, especially the development of strength and power endurance in them, the structure of long-term training of athletes proposed by V.N. Platonov [11] developed an exemplary program and the structure of long-term preparation of young arm-sportsmen. Based on the proposed structure of many training arm wrestlers and block training system designed experimental program training arm wrestlers on stage of specialized basic training.

The work is done according to SRW of Kharkiv state academy of physical culture.

Aim, task, material and methods.

Aim of work: to determine the impact of developed training experimental program for arm wrestlers aged 16-17 years old on power and speed-strength performance.

Tasks of work:

- 1). based on the block system to offer a training plan of annual training macrocycle of arm wrestlers aged 16-17-years old;
- 2). to determine impact of the proposed program to the reaction of the motor vehicle in boys of 16-17 years old;
- 3). provide practical recommendations for training at the stage of basic training in specialized arm wrestling.

It was used the following methods: pedagogical methods (monitoring the training process, interviews with athletes, coaches poll, analysis programs of arm wrestling, registration performance, racing athletes compliance content of the training process), pedagogical experiment, the methods of mathematical statistics. In study involved 30 boys 16-17 years and for 15 in the control and experimental groups.

Results.

Based on theoretical and methodological development of Yu. Verhoshanskii about the features of a block system of training (2005), methodological recommendations of E. Usanov [12] and I. Belsky [6], according to the system of training in arm wrestling we developed experimental program [1-5] of training of 16-17-years old arm wrestlers. Annual program of training includes 5 blocks: 1 - block of prior training, 2 - block of basic training, 3 - block of specialized training, 4 - competitive block, 5 - block of recovery workout. Each block of training has characteristic for its structural, time, content and target characteristics.

Comparative analysis of the level of strength abilities of young arm wrestlers of control and experimental groups at the end of the experiment showed that significant positive changes in the functional state of the organism and the level of physical preparedness of young experimental group made it possible to achieve significantly high levels of strength and static endurance of arm wrestlers for major muscle groups - wrist flexors, forearm flexor, extensor forearms, trunk extensors and calf muscles.

Thus, the rate of force flexor hands in the experimental group during the experiment increased by 13.4% (from 45.7 kg to 52.8 kg), while in the control group, the difference was 9.3% (up from 46.1 kg to 50.4 kg). The difference between data control and experimental groups significant ($p < 0,05$; $t = 2,24$) - Fig. 1, Table 1.

Power indicator flexor forearm of athletes of experimental group increased from 37.7 kg to 44.8 kg (difference 15.8%) and in the control group grew by 5.8% (from 38.4 to 42.3 kg). Intergroup difference strength of muscle groups was reliable ($p < 0,05$; $t = 2,25$) - Figure 1, Table 1.

The changes of force (Fig. 1) extensor forearm in both groups and between groups had a similar degree of change. Thus, in the control group power indicator of muscle groups changed by 9.2% (from 30.6 to 33.7 kg), while the experimental group of athletes - by 14.2% (from 30.8 to 35.9 kg). End intergroup indices differed significantly ($p < 0,05$; $t = 2,31$) - Table 1.

Table 1

Change of forces of investigated muscle groups in the experimental and control groups (September 2009 - July 2010)

№	Muscle group	Flexor of hand (kg)		Flexor of forearm (kg)		Extensor of forearm (kg)		Extensor of body (kg)		Calf muscles (kg)	
		Time of research		Time of research		Time of research		Time of research		Time of research	
		September	July	September	July	September	July	September	July	September	July
1.	Experimental group	45,7 ± 0,81	52,8 ± 0,59	37,7 ± 0,84	44,8 ± 0,64	30,8 ± 0,78	35,9 ± 0,61	105,8 ± 1,33	114,5 ± 1,22	105,7 ± 1,76	116,9 ± 1,59
2.	Control group	46,1 ± 0,7	50,4 ± 1,81	38,4 ± 0,68	42,3 ± 0,91	30,6 ± 0,71	33,7 ± 0,73	106,7 ± 1,51	110,3 ± 1,38	106,9 ± 1,64	111,4 ± 1,73
3.	Reliability of changes	$p > 0,05$ $t = 0,37$	$p < 0,05$ $t = 2,24$	$p > 0,05$ $t = 0,98$	$p < 0,05$ $t = 2,25$	$p > 0,05$ $t = 0,19$	$p < 0,05$ $t = 2,31$	$p > 0,05$ $t = 0,45$	$p < 0,05$ $t = 2,28$	$p > 0,05$ $t = 0,50$	$p < 0,05$ $t = 2,35$

Table 1

Changing of static endurance of studied muscle groups in the experimental and control groups (September 2009 - July 2010)

№	Muscle group	Flexor of hand (s)		Flexor of forearm (s)		Extensor of forearm (s)		Extensor of body (s)		Calf muscles (s)	
		Time of research		Time of research		Time of research		Time of research		Time of research	
		September	July	September	July	September	July	September	July	September	July
1.	Experimental group	116,7 ± 1,90	130,6 ± 1,72	134,2 ± 2,07	149,9 ± 1,68	110,3 ± 1,84	123,9 ± 1,58	113,8 ± 1,90	125,6 ± 1,74	200,7 ± 4,30	213,3 ± 3,81
2.	Control group	115,5 ± 1,81	120,2 ± 2,13	133,5 ± 1,93	143,3 ± 2,12	111,1 ± 1,96	117,3 ± 2,08	113,2 ± 2,20	119,7 ± 1,88	201,5 ± 5,26	206,9 ± 4,05
3.	Reliability of changes	$p > 0,05$ $t = 0,46$	$p < 0,01$ $t = 3,34$	$p > 0,05$ $t = 0,36$	$p < 0,05$ $t = 2,41$	$p > 0,05$ $t = 0,29$	$p < 0,05$ $t = 2,58$	$p > 0,05$ $t = 0,27$	$p < 0,05$ $t = 2,30$	$p > 0,05$ $t = 0,19$	$p < 0,05$ $t = 2,35$

Comparison of the power capacity of the trunk extensors between the studied groups showed that at the end of the experiment athletes of experimental group have significantly higher rate (35.9 kg instead of 33.7 kg) ($p < 0,05$; $t = 2,31$). Growth in the experimental group in percentage were two times higher than controls (7.6% instead of 3.4%) - Fig. 1, Table 1.

Power indicators of calf muscles at athletes of control group during the study increased from 106.9 to 111.4 kg (4.2%), and experimental - 9.6% (from 105.7 kg to 116.9 kg). The difference between groups was significant ($p < 0,05$; $t = 2,35$) - Fig. 1.

Conducted at the end of the experimental training program control test of static strength endurance enabled to state that the corrected plans of training at the stages of basic and specialized training allow significant increase of power endurance of athletes of different muscle groups of the experimental group (Table 1). So, flexor of hands a growth was 10.6%. Indicator of static strength and endurance of muscle groups increased from $116,7 \pm 1,9$ s to $130,6 \pm 1,72$ s. Control group of athletes in the growth rate of this indicator was 4.1%. In numerical terms it is - from $115,5 \pm 1,81$ s to $120,2 \pm 2,13$ s (Table 1). Intergroup difference was reliable - $p < 0,01$ at $t = 3,34$.

Dynamic of growth of power capacity flexors and extensors of the forearm had a similar trend foregoing changes. Thus, intergroup difference at the beginning of the experiment in these muscle groups are not significantly different ($p > 0,05$; at $t = 0,36$ and $0,29$), and at the end of the experiment the distinction as in the first group of muscles ($p < 0,05$; $t = 2,41$), and in the second ($p < 0,05$; $t = 2,58$) was reliable (Table 1). In numerical terms, these indicators respectively equal: the flexor forearm - $149,9 \pm 1,68$ s vs $143,3 \pm 2,12$ s, extensor forearms - $123,9 \pm 1,58$ s vs $117,3 \pm 2,01$ s (Fig. 1).

Indicators in the trunk extensors at arm wrestlers of experimental group also differed by significant difference of growth ($p < 0,05$; $t = 2,30$) compared to the control group. Thus, the experimental difference between the groups was not significant ($113,8 \pm 1,90$ s instead of $113,2 \pm 2,20$ s), and finally statistically different ($125,6 \pm 1,74$ s instead of $119,7 \pm 1,88$ s) - Table 1, Fig. 1.

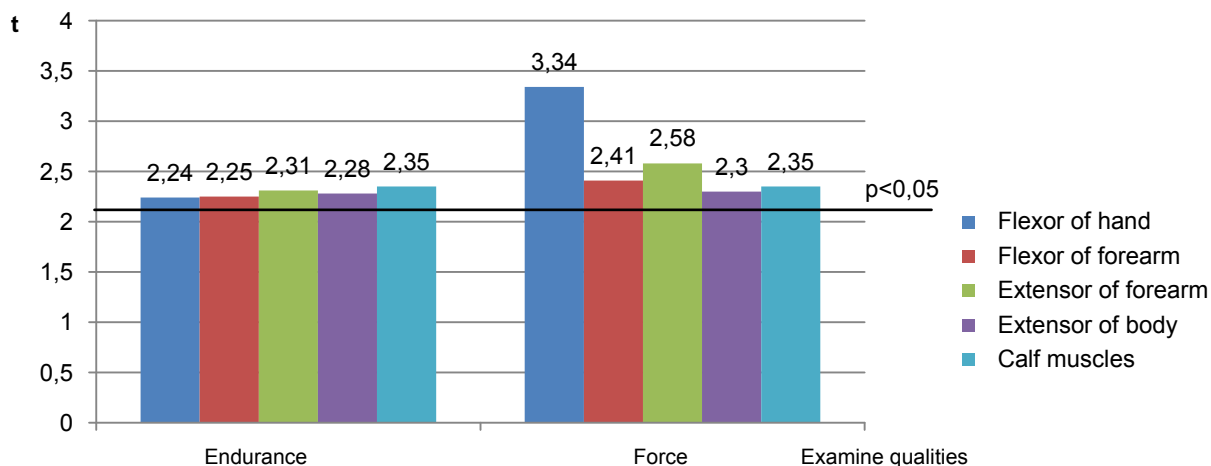


Fig. 1. The reliability of the variation of the static endurance and muscle groups studied athletes of experimental group compared with the control (July 2010)

Investigated power abilities calf muscles in both the experimental and the control groups significantly increased. But it should be noted that the athletes experimental group the increase was from $200,7 \pm 4,3$ s to $213,3 \pm 3,81$ s and in control - of $201,5 \pm 5,26$ s only $206,9 \pm 4,05$ sec, respectively intergroup difference was statistically significant ($p < 0,05$; $t = 2,35$) - table 1, Fig. 1.

On the basis of received data we can provide the following practical recommendations for coaches and experts of arm wrestling.

Stage of specialized basic training (16-17 years) provide for increasing time to improve combat vehicles at the table to 15%. Particular attention should be given to special physical training - 34%, for general physical training and differential physical training, accordingly, 14% and 18%.

Block of specialized training must focus on the development of explosive power, handling weak corners, the changing nature of work. Training with static loads are required for effective training arm wrestling and total load must contain at least 20%, that is part of static exercises - $40\% \pm 5\%$ of the total special.

It is necessary to plan block of recovery training for physical and psychological recovery of athletes after a preparatory period and participate in sports, identifying and understanding mistakes and finding ways to address them. At this stage, there should not be a complete physical inactivity, it is necessary to exercise 2-3 training a day by means

of general physical training and supporting physical training: training should be conducted in recreational activities - cross training, sports, swimming in the pond, hemispherical exercises with rubber plait and expanders.

Conclusion.

Based on a block system of training for 16-17-year arm wrestlers experimentally substantiated annual training program that includes 5 blocks: 1 - block of prior training (24 weeks); 2 - block of basic training (16 weeks) 3 - block of specialized training (8 weeks), 4 - competitive block (1 week), 5 - block of recovery training (3 weeks). Each stage of training has characteristic structure, time, destination and content characteristics. At stage of basic training correlation of static and dynamic loading is 31% and 69%, and at stage of specialized training - 38% and 62% of the total amount of specialized exercises.

Experimental program of training of 16-17-year arm wrestlers enabled significantly increase the performance of special strength training in all investigated muscle groups. Established that block system of workloads in annual macrocycle is quite effective. So, all the studied power indexes of athletes of experimental program significantly improved at the end of the experiment.

Further studies will be directed on individualization of sports training of arm wrestlers.

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