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Features of use of modular training system armsportsmen 16–17 year olds in the annual macrocycle.

Abstract. Purpose: to determine the most effective ratio of different means and methods of training 16–17 year olds armsportsmen the application of the block training system in the annual macrocycle. **Material and Methods:** 30 armsportsmen investigated 16–17 years to 15 in the control and experimental groups; analyzed and summarized the data of scientific and methodical literature, conducted teacher testing, pedagogical experiment, and methods of research used functional state of cardio-respiratory. **Results:** it was found that the block system of training 16–17 year olds armsportsmen allows significantly increase the level of morphological and functional training base, improves functional indices of the cardiovascular system. **Conclusions:** the experimental training program for 16–17 year olds armsportsmen based modular training system allowed the athletes to create the experimental group was significantly higher level of morphofunctional sports training base, significantly improve the functionality of the body athletes, contributed to a high level of fitness and sports is recommended to practice the preparation armsportsmen.

Keywords: modular system, static exercises, the annual macrocycle, morphofunctional base.

Introduction. Arm sport is one of the young sports. In this regard problems of planning, programming of the training process are presented in the form of debatable options of training of sportsmen in scientifically-methodical literature.

Modern arm sport has a power character, but by the manifestation of motive abilities is a high-speed and power sport. At the same time it comes nearer to a fight on indicators of technical and tactical actions of sportsmen for the achievement of result in competitions.

The competitive exercise in arm sport needs manifestation of a big power tension, therefore this sport is very injury-prone. Before a direct single combat on a table it isn't recommended to start at once to the even physically-trained sportsmen as there is the high probability of receiving a serious trauma which can call into a question the subsequent lessons of arm sport, without the corresponding preparedness of the copular and articulate device of the top humeral belt to a specialized loading [3].

In this regard the search of the most effective ratio of different means and methods of training arm wrestlers gains a special relevance.

According to our data, the intensity of growth as forces, and static power endurance decreases, but the indicator of static force stores high growth rates in the aged development of armsportsmen in 16–17 years old [3].

Communication of the research with scientific programs, plans, subjects. The scientific research is executed by a subject of the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 by a subject 3.7 "Methodological and organizationally-methodical bases of definition of individual norm of a physical condition of a person" (number of the state registration is 0111U000192).

The objective of the research: to define the most effective ratios of different means and methods of training of armsportsmen of 16-17-years old at the use of the block system of training in an annual macrocycle.

Material and methods of the research. The theoretical analysis and synthesis of data of scientifically-methodical literature, pedagogical testing, pedagogical experiment, methods of the research of a functional condition of the cardiorespiratory system – vital index, heart rate, arterial pressure, coefficient of economization of blood circulation, systolic and minute volume of blood. 30 sportsmen of 16-17 years old on 15 took part in the control and the experimental groups in the research.

Results of the research and their discussion. The experimental program of training is developed on the basis of the structure of long-term preparation of young armsportsmen which was used for arm wrestlers of 16–17 years old at a stage of the specialized basic preparation. The period of 16-17 years old was chosen not casual: behind our supervision, the greatest loss of young sportsmen and their outflow from sport is observed at this age. It is apparently caused by their active entry into the society, the search of a personal "I am", places in life and society, difficulties of the competitive activity which is the share of the age of 16-17 years old.

The theoretic-methodological development of Y. V. Verkhoshansky about features of the block system of trainings is the basis for the experimental program [4]. The annual program of training includes 3 blocks: 1 – the block of the previous training; 2 – the block of the basic training; 3 – the block of the specialized training (tab. 1).

The use of the offered program of trainings made a basic part of the main experiment. Sportsmen were distributed on two groups: control and experimental. Control – was trained by the offered programs of P. V. Zhivora at other coach, experimental – according to the experimental program.

The block of the previous training includes the 2nd cycles for 12 weeks. The second cycle, except for the increase in training loads, depending on individual growth rates of physical and functionality of the sportsman repeats the first.

This block of training was directed on mobilization and support of working activity of the morphofunctional system of an organism which was created in the previous cycles of training. Tasks of the increase of aerobic power are solved, the process of morphofunctional specialization becomes more active. All used means of physical preparation (mainly auxiliary and all-physical) have to be guided not by the development of force of muscles, and by an organism operating a mode intensification for the purpose of the increase of local muscular endurance.

Each 12-week cycle includes three stages: 1) 1–6 weeks – work with a large number of repetitions (till 50) and small

Table 1

The annual distribution of class periods in the experimental group (in hours)

Sections of the training program	Stages of training			Total (48 weeks)
	Block of the previous training (24 weeks)	Block of the basic training (16 weeks)	Block of the specialized training (8 weeks)	
Theoretical preparation	4	3	–	7
Psychological preparation	–	2	2	4
General physical preparation	28	18	8	58
Auxiliary physical preparation	34	23	12	71
Special physical preparation:				
a) exercises of a dynamic character	58	40	20	118
b) exercises of a static character	–	18	12	30
Working off of technique of a fight at a table	30	20	10	60
Tactics of maintaining a duel	–	4	6	10
Practice of refereeing	–	2	2	4
Implementation of test standards	2	2	–	4
<i>In total for a stage:</i>	156	132	64	
<i>In total in a year:</i>				352

encumbrance (to 50% from maximum); 2) 7–8 weeks – all exercises are carried out with the maximum speed (10–15 repetitions); 3) 9–12 weeks – all exercises are carried out with the big encumbrance (to 80–90% from maximum) till 8 repetitions.

The block of the previous training is a block of activation of a quick function of the neuromuscular device, the increase of power of an organism, the improvement of base of sports technique at an optimum speed and power of efforts. At this stage of training of use of the concentrated loadings allows stirring up activity of the quick device, and also vegetative and power systems which increase its function.

The used methods of training are guided not by the development of force of muscles, and by an organism operating a mode intensification for the purpose of the development of local muscular endurance due to the increase of reduced power of both slow, and fast muscular fibers [4]. Thus, the concentrated use of auxiliary and, especially, specialized physical preparation significantly makes active a morphofunctional specialization of an organism to the chosen type of the competitive activity.

The block of the basic training lasts 16 weeks. The training process of this block is aimed at the development of force and power endurance. The training load is focused on the increase of power and capacity of the power providing systems of an organism, the formation of peripheral vascular reactions, the increase of power of buffer systems of cages and blood, the increase of reduced power of muscles. In this cycle it is essentially important to adhere to an optimum ratio of means of the general, auxiliary and special physical preparation. Approximately this ratio has such appearance: GPP – 30±5%, APP – 30±5%, SPP and directly a fight on a table – 40±5%.

During the training it is offered to carry out 3–4 special exercises, in each exercise from 4 till 6 approaches at what 35±5% of special exercises are carried out in the static mode. Between approaches it is necessary to do a break for 1,5–2 minutes. Trainings are carried out three times for a week, the fourth day is intended for active recreation.

The block of the basic training provides the specifically directed increase in power and capacity of the power providing systems of an organism by means of the increasing intensity of training loads. At this stage of the training process a transition of an organism from urgent to long-term adaptation is carried out. This process is promoted by a stress – reaction of an organism to increase of intensity of a performance of exercises. The stressful syndrome in turn intensifies structural transformations in the working muscles. The increase of intensity and power of a performance of auxiliary and competitive exercises is reached on condition of use of repeated, interval and control methods of training. Such orientation of the training process is followed by the increase of power and capacity of anaerobic power sources, reduced power of muscles and oxidizing properties of fast muscular fibers [4].

The block of the specialized training is aimed at the development of explosive force, study of weak corners, change of kind of work. Trainings with static loadings are obligatory for effective classes by arm sport and in a total amount of loadings have to make not less than 20%, that is the part of static exercises has to make 40±5% of the total amount of the special. The duration of this cycle – 8 weeks. Trainings are carried out three times for a week, the fourth day to a macrocycle is devoted to active recreation (cross-country, sports, a steam bath).

In the block of the specialized training the training process is directed on the subsequent increase of a specific quick function, the achievement of high power level and capacity of an energy potential of an organism and its ability, effectively and economically to use these qualities during trainings and competitions.

Training classes are devoted mainly to modeling of competitive conditions, programs, tactical options, number of approaches, rest intervals. It is known that stressful reactions of an organism to loadings which model competitive activity, allow increasing significantly oxidizing properties of muscles (mainly fast muscular fibers) [4]. Thus, the morphofunctional

specialization of an organism is stabilized at a higher level of capacity and profitability of work at this stage of the training process.

Training according to the experimental program of preparation allowed young armsportsmen to come to the new, highest level of functional and physical fitness. So, the data of a functional condition of the cardiorespiratory system of armsportsmen skilled group authentically improved in comparison with indicators of sportsmen of the control group. It is confirmed by HR indicators (in CG – $67,9 \pm 1,1$ bpm⁻¹, EG – $64,6 \pm 1,0$ bpm⁻¹, $t=2,15$; $p<0,05$); vital index, respectively, $67,4 \pm 0,8$ ml · kg⁻¹ instead of $69,8 \pm 0,7$ ($t=2,18$; $p<0,05$); arterial pressure: systolic pressure – $127,3 \pm 1,3$ mm of mer. instead of $123,4 \pm 1,1$ mm of mer. ($t=2,23$; $p<0,05$), diastolic pressure – $77,6 \pm 1,2$ mm of mer. instead of $73,8 \pm 1,0$ mm of mer. ($t=2,45$; $p<0,05$); coefficient of economization of blood circulation – $3297,8 \pm 94,1$ s.u. instead of $2956,4 \pm 90,3$ s.u. ($t=2,61$; $p<0,05$) (tab. 2).

Table 2

Dynamics of the studied indicators of young armsportsmen during an annual macrocycle of preparation

Indicators	The beginning of the experiment			The end of the experiment		
	CG (n=15)	EG (n=15)	p	CG (n=15)	EG (n=15)	p
Vital index (ml·kg ⁻¹)	64,7±1,05	65,4±0,96	p>0,05, t=1,79	67,4±0,84	69,8±0,72	p<0,05, t=2,18
HR (bpm ⁻¹)	69,7±1,43	68,5±1,13	p>0,05, t=0,84	67,9±1,14	64,6±1,03	p<0,05, t=2,15
Systolic pressure (mm of mer.)	129,6±1,54	128,7±1,76	p>0,05, t=1,51	127,3±1,25	123,4±1,13	p<0,05, t=2,23
Diastolic pressure (mm of mer.)	78,3±0,98	79,5±1,14	p>0,05, t=2,05	77,6±1,21	73,8±0,97	p<0,05, t=2,45
Coefficient of economization of blood circulation (s.u.)	3405,8±98,5	3373,3±94,3	p>0,05, t=1,05	3297,8±94,1	2956,4±90,3	p<0,05, t=2,61
Systolic volume of blood (ml)	68,3±2,34	67,9±2,56	p>0,05, t=0,64	69,9±2,12	72,6±1,98	p>0,05, t=,93
Minute volume of blood (ml)	4721,8±89,7	4684,3±94,4	p>0,05, t=0,52	4787,6±99,4	4896,6±89,3	p>0,05, t=1,56

Therefore, the development of the experimental program of preparation of armsportsmen allowed to create rather high level of morphofunctional basis of the increase and the intensification of the subsequent training loads in the block of specialized preparation at sportsmen of the experimental group on the basis of the block system of training with installation on concentration of loadings of auxiliary (semispecial) and special physical preparation during rather big adaptation cycle (24 weeks of the last and 16 weeks of the basic preparation).

Conclusions:

1. The developed experimental program of preparation of armsportsmen of 16-17-years old allowed to create authentically high level of morphofunctional base of sports preparation at sportsmen of the experimental group on the basis of block system of training with an orientation on concentration of loadings of auxiliary and specialized physical preparation during rather big adaptation cycle (24 weeks of the last and 16 weeks of the basic preparation).

2. The experimental program of preparation of armsportsmen of 16-17-years old allowed to increase the functionality of an organism of sportsmen authentically. So, the economic form of warm activity develops firmly in the cardiovascular system to what reliable changes of indicators of HR testify ($p<0,05$; $t=2,15$), arterial pressure ($p<0,01$; $t=2,54$), coefficient of economization of blood circulation ($p<0,01$; $t=3,19$) and minute volume of blood ($p<0,05$; $t=2,63$). In comparison with data of the control group the indicator of a vital index authentically raised at sportsmen the experimental group ($p<0,05$; $t=2,18$).

3. The application of static exercises of local action and dynamic character in such ratio: 12% and 88% in the block of the previous training, 31% and 69% in the block of the basic training and 38% and 62% of the total amount of specialized exercises in the block of the specialized training rather effectively promote the achievement of high level of sports preparedness.

4. The annual macrocycle of preparation of arm wrestlers of 16-17-years old that includes 3 blocks (1 – the block of the previous training (24 weeks); 2 – the block of basic training (16 weeks); 3 – the block of specialized training (8 weeks)), is rather effective and recommended to preparation practice of armsportsmen.

The subsequent researches will be directed to the area of individualization of training of armsportsmen at the stage of preparation for the highest sporting achievements.

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