FUNCTIONAL TRAINING LEVEL OF RUNNERS STUDENT-ATHLETES SPRINTERS

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ABSTRACT

This article describes the results of research on functional readiness of short-distance student-athletes. The article also focuses on the optimal planning of workloads based on the formation of functional levels of student-athletes using tests of functional indicators.

Keywords. Training, student-athletes, runners, the physical development, working capacity, the loading, physiological training, sprinters.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Actuality of work. Training of qualified athletes running for a short distance is a multi-year pedagogical process, carried out on the basis of step-by-step planning of sports activities. At the stages and periods of this preparation, the student-athletes belonging to the training group are currently being studied by leading scientists on such processes as the ratio of general and special physical training, the cycle of training applied to technical and tactical training (micro, meso and macroclasses), the volume of loads, intensity, pre-competition, competition activities, the holding of sports uniforms. (1, 2, 3, 5).

However, if we consider that the optimal variants for planning annual training of qualified student-athletes specializing in short-distance running types of Athletics have been developed correctly, then the tool used in it, the efficiency and ratio of the methods (GPP and SPP), the volume of loads, the performance intensity, the number of repetitions, the rest interval and the athletes are not planned. Indeed, as we examine the processes of training athletes as runners for a short distance, we can see that the annual training sessions on the system of training of athletes are relatively optimized and the planning has practically not been studied in the last 20 years as a scientific object in the territory of the Republic (1, 4,5).

The purpose of the work. To examine the dynamics of functional training level of highly qualified student-athletes running short distance.

The results of the study and their discussion. It can be argued that the processes of training of light athletics in the types of running for a short distance, as well as the ability for it to withstand the organism of athletes, to bear the loads, in many respects depends on the functional state of the participants. Therefore, in the course of the research, it is necessary to plan the functional preparatory state of the student-athletes in the period and stages of their annual training, with the optimization of the annual training sessions due to the influence of the loads on the body of the athletes, as well as their functional state.

The versatility of the load is determined by the variety of tasks involved in the workout, the ability of athletes to work in different structures (micro, meso, macrocycles) and the need to manage recovery. Various forms and means of sports activities that have a comprehensive impact on the athlete's body, the use of different workloads on individual training sessions and parts, provide a variety of workloads during the workout and determines the effectiveness of the work through the ability of the body to depend on the results of the sport (1, 2, 4, 5).

The multiple variability of loads contributes to the comprehensive development of the functional state of the participants, that is, the factors that determine the level of sports results, individual exercises help to increase the working capacity in the performance of loads in training and microclimate, increase the volume of work performed, the intensity of recovery processes, as well as to prevent cases of fatigue.

Rational and optimized planning of the training process, taking into account the removable loads of students-athletes in addition to their annual training, is currently considered the most important factor of improvement in sports. Because it is no secret to anyone that the physical changes to the loads in the practical and theoretical training given by the student-athletes in the training program, the volume of energy spent, as well as the loads of the training they perform in the future, have a significant impact on their body. However, in modern sports training it is shown that the load exceeds the level of capabilities of a person. Taking into account the functional capabilities of the training with relatively stable quantitative dimensions of its activity will be of great importance in the optimization of the training process.

The effectiveness of mastering all types of loads used in the multi-year cycle of training of student-athletes, the formation of opportunities for physical, psychological, technical and tactical training, as well as the growth of sports results are dependent on the ability of athletes to remain at the level of proper functional training. In particular, this indicates the need to take into account even in the training cycle of highly trained short-distance runners. No matter what athletes do in the training system, the size, intensity and quality of these exercises are determined by the functional reserves and bioenergetics capabilities of their bodies. It is also worth noting that constant training loads, depending on the specific characteristics of the sport, gradually lead to the functional specialization of the organism. It is also known that, the possibility of achieving high sports results is determined by the activity of the cardiovascular and respiratory organs, both in terms of functional capabilities and in terms of the level of excitability of the central nervous system, which provides these qualities, since in short-range types of athletics the endurance of speed, speed and strength are inherent in the composition

In our research, we focused on determining the physical development of student-athletes in assessing their ability to work and functional activity according to the following physiologic indicators.

There were examined the minute volume of blood (MVB, l/min), the systolic volume (SVB, ml), the heart rate (HR, beats/min), Arterial blood pressures (SBP, DBP, PP, SDBP), the Stange test (num), the VC (l/min), The energy capacity of the load (kgm/Min), the working capacity (PWC170 kgm/Min), the working capacity of HSTI (height 50 cm. the maximum oxygen uptake (MOU, ml/min) was determined on the relative MOU (ml/min) (the number of ascents and descents on the pedestal with a height of 50 cm. during 1 and 5 minutes). The height, body weight and height index of the athletes were also studied.

According to this, the average height of students - athletes running to short distances before the survey was 178,4±7,3 cm and at the end of the survey it was 179,2±7,2 cm. In determining of the weight before the survey it was 66,9±6,4 kg and after it became 67,8±6,7 kg.

The height-weight index was equal to an average of 374,9±30,0 kg/cm, and at the end of the study it was determined that this index was an average of 378,3±30,4 kg/cm. The results of the research obtained are given in Table 1 below.

Table 1: Dynamics of the results of the tests to determine the working capacity of short-distance runners student-athletes before and after the study

Physiological indicators		Experimental group			
		BS	AS	t	P
MVB, l/min	BL	4,289±0,494	4,981±0,441	4,94	<0,05
	AL	8,578±0,524	9,145±0,614	2,43	<0,05
SVB, ml	BL	58,9±2,1	60,9±2,2	2,28	<0,05
	AL	71,5±2,8	73,8±2,3	2,20	<0,05
HR, /min	BL	76,4±2,7	75,1±2,4	2,21	<0,05
	AL	122,6±3,6	119,2±3,5	2,35	<0,05
SBP, mmHg	BL	127,4±4,1	123,9±3,7	2,20	<0,05
	AL	146,7±8,6	140,2±7,6	2,24	<0,05
DBP, mmHg	BL	86,5±2,7	84,2±2,3	2,25	<0,05
	AL	82,9±4,2	79,4±3,6	2,19	<0,05
PP, mmHg	BL	44,3±3,5	48,5±3,4	2,98	<0,05
	AL	63,8±5,6	68,7±5,2	2,22	<0,05
SDBP, mmHg	BL	101,4±7,4	94,9±7,7	2,20	<0,05
	AL	105,8±4,5	101,9±4,2	2,19	<0,05
Strength of the right hand, kg	BL	44,3±8,5	52,9±7,0	2,27	<0,05
	AL.	38,2±7,2	43,6±6,9	2,21	<0,05
Strength of the right hand, kg	BL	40,7±2,5	43,6±3,6	2,52	<0,05
	AL	38,3±3,5	42,5±3,6	2,90	<0,05
Stange-Hench test,	BL	44,6±9,9	53,1±8,5	2,26	<0,05
	AL	40,5±7,4	47,2±7,3	2,23	<0,05
TLC l/min	BL	3,9±0,52	4,4±0,32	2,84	<0,05
	AL	3,5±0,44	4,1±0,37	2,41	<0,05
Loading Power kgm/min	BL	879,4±175,2	1001,9±168,3	2,22	<0,05
	AL	1124,6±154,2	1306,4±175,9	2,29	<0,05
PWC170 kgm/min	BL	1542,3±278	1778,0±249	2,19	<0,05
MOU, l/min	BL	4,244±0,8	4,875±0,6	2,19	<0,05
MOU rel., ml/kg/min	BL	62,93±10,2	71,6±9,1	2,20	<0,05
HSTI	BL	94,4±14,5	111,4 ±13,8	2,94	<0,05

Note: L. – before the loading, AL. – after the loading.

At the end of the experiment, figures were on average 4,981±0,441 l/min, while the minute volume of blood (MVB) was equal to 4,289±0,494 l/min before loading in the tests obtained at the beginning of the study. After 5 minutes of rest after the loading, the results of the examination were 8,578±0,524 l/min on average at the beginning of the study, at the end 9,145±0,614 l/min. When comparing the results obtained at the beginning and at the end of the study, t=4,94 and the level of reliability in this test were equal to <0,05.

In the test taken to determine the systolic blood volume (SBV), the average indicator before loading was 58,9±2,1 ml/min at the beginning of the study, the average was 60,9±2,2 ml/min at the end of the study. At the beginning of the study on post-loading indicators, it was 71,5±2,8 ml/min and at the end of the study was 73,8±2,3 ml/min. We can see that statistical reliability in this SBV study test is <0,05.

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In the test taken before the study on the number of heart rate (HR), the average figure before loading is 76,4±2,7 beat/min. during the course of the study, we found that in the post-loading state, it was 75,1±2,4 beats/min, respectively at the end of the study, it was 122,6±3,6 beats/min and 119,8±3,5 beats/min, and the level of reliability was equal to <0,05.

At the end of the experiment, on student-athletes' systolic blood pressure (SBP) at the beginning f the survey we had an average of 127.4 ± 4.1 mmHg before the load. At the end of the experiment the mean was 123.9 ± 3.7 mmHg. After the load at the beginning of the survey, the mean values were 146.7 ± 8.6 mmHg and at the end of the study was 140.2 ± 7.6 mmHg. Statistical reliability of tests was equal to <0.05.

The test conducted on diastolic blood pressure (DBP) revealed figures on average 86,5±2,7 mmHg before the study load. After the survey - 82,9±4,2 mmHg At the end of the study, these indicators were 84,2±2,3 mmHg until the load and after loading the indicator average was 79.4±3.6 mmHg and it turned out that the degree of reliability is equal to <0,05.

At the beginning of the experiment the pulse pressure (PP) was until the load on average 44,3±3,5 mmHg, at the end of the study it was equal to the average 48,5±3,4 mmHg. At the beginning of the survey before the load experiment measurement was equal on average 63,8±5,6 mmHg, and at the end of the experiment it has changed to average 68,7±5,2 mmHg. Which means that it's statistic reliability was equal to <0,05.

During the research of the SBP it was observed that before the load measurement was equal to on average 101,4±7,4 mmHg, after the load it was equal to 94,9±7,7 mmHg, at the end of the experiment after the load measurement was equal to 105,8±4,5 mmHg and 101,9±4,2 mmHg and reliability was identified which was equal to <0,05.

During The Stange-Hench test which is holding breath physiological experiment, at the beginning measurements were equal to an average 44,6±9,9 before the load and 53,1±8,5 after the load. At the end of the experiment these measurements were equal to on average 40,5±7,4 before the load and 47,2±7,3 after the load. These results showed that statistic reliability was equal to <0,05.

At the beginning and at the end of the experiment total lung capacity accordingly was equal to 3,9±0,52 l/min and 4,4±0,32 l/min before the load, further it was equal to 3,5±0,44 l/min and 4,1±0,37 l/min after the load, also it was observed and identified reliability (0,05).

In the research of the energy capacity of the load, the results of it at the beginning was equal to 879,4±175,2 kgm/min before the load and 1001,9±168,3 kgm/min after the load, at the end the experiment it was equal to 1124,6±154,2 kgm/min before the load and 1306,4±175,9 kgm/min. From this test was observed the rise of the statistic reliability (<0,05).

Before the experiment by PWC 170 the performance of subjects was equal to 1542,3±278 kgm/min, at the end of the test the measurement was equal to 1778,0±249 kgm/min and statistic reliability was <0,05.

In the next experiment maximum oxygen consumption (MOC) was equal to 4,244±0,8 l/min, during the test it was observed that after the experiment measurement has changed and was equal to 4,875±0,6 l/min, also statistic reliability was identified (<0,05).

Including during the experiment relative maximum oxygen consumption was revealed and equal to 62,93±10,2 ml/kg/min at the beginning of the test. At the end of the experiment the improvement has been revealed and measurement was equal to 71,6±9,1 ml/kg/min. Statistic reliability was equal to <0,05.

In the experiment by HSTI before the test the figures were 94,4±14,5, at the end of the experiment it was revealed that the measurement was equal to 111,4±13,8. Statistic reliability was also revealed and equal to <0,05. (Taken results are in the table 1)

When the results of physiological parameters in the beginning and in the end was compared to the information given by leading specialists scientists V.N.Seluyanov, in the 2000 year, M.P.Shestakov, in the 2002 year, the information given by V.N.Smirnov and V.I.Dubrovskiy, also by V.N.Platonov and O.I.Pavlov in the 2004 year, there was no noticeable difference between. From the results of this tests it was revealed that 4 athletes should improve capacity to operational strength and operational endurance.

According to the given morph functional parameters 7 athletes who are students-athletes running short distance should pay attention to building capacity to special endurance. Therefore, we have created particular method for students-athletes running short distance and using tests like B, RF, MOU, HRS which reveals functional parameters that forms functional level of students-athletes whose loads are optimally planned, improving functional preparation and altogether helps to make sport results ascension.

Conclusion: The experience with functional training students-athletes made it possible to note the following conclusions:

It is important to create training facilities and distribute loads according to student-athlete's individual features (level of preparation, functional state, psychological and technical-tactical preparation)

The analysis of the results of the experiment on functional training of students-athletes belonging to the experimental group showed that 4 athletes need to develop the quality of operational strength, it was found that 7 athletes lack the quality of operational endurance.

The students-athletes belonging to this experimental group showed that in the distribution of loads on intensity zones in the training process, the introduction of swimming and restorative means into the training process, as well as the need for distribute training in a ratio of three to one.

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