

DETERMINING THE OPTIMAL PHYSICAL ACTIVITY FOR STUDENTS WITH DIFFERENT LEVEL OF MOTOR QUALITIES DEVELOPMENT

ODREĐIVANJE OPTIMALNE FIZIČKE AKTIVNOSTI ZA STUDENTICE S RAZLIČITOM RAZINOM RAZVOJA MOTORNIH SPOSOBNOSTI

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Izvorni znanstveni članak

Sažetak: U članku se raspravlja o optimalnoj fizičkoj aktivnosti za studentice s različitim stupnjem razvoja motoričkih sposobnosti tijekom njihova treninga. Specificirane su karakteristike potrebne za poboljšanje fizičke kondicije u razvoju osnovnih fizičkih osobina – izdržljivost, jakost, istrajnost, agilnost, brzina i snaga potrebne za postizanje visoke razine fizičke kondicije, kao osnove mentalnih i fizičkih performansi..

Ključne riječi: studentice, fizička kondicija, fizička aktivnost, oporavak.

Original scientific paper

Abstract: This article discusses optimal physical activity for female students with different levels of motor qualities development in the course of their training. Characteristics of improving physical activity in the development of basic physical qualities are specified - endurance, strength, strength endurance, agility, speed and power – necessary to acquire a high level of physical activity, as the basis of mental and physical performance.

Key words: female students, physical fitness, physical activity, recovery.

1. INTRODUCTION

The leading idea of the Bologna process is to achieve the high quality education level. Priority of education development is the implementation of modern innovative technologies that provide further improvement of the educational process. Modern expert should differ not only by a high level of professional training, but also by health. Therefore, physical culture and sport is becoming a major factor in ensuring high functional condition of the organism, optimal intellectual working capacity and the formation of personal qualities.

2. METHODOLOGY

Currently, there is no doubt that the improvement of person's physical preparedness is achieved by the use of relatively high intensity, volume, and density of physical activity [2, 3, 4, 5]. On the other hand, inadequate use of large training workouts, especially for people with poor physical activity, may result with adaptive changes of the

cardiovascular system, which proceeds the limits of purposeful adaptation and is at the boundary with the pathology [1]. That is why the application of appropriate level of physical preparedness has an extremely important role in the student's healing process . The influence of activity on the body is measured and oriented through the number of repetitions of an exercise and duration of rest intervals [2, 5]. The aim of the study was to determine the range of possible physical activities in groups with low and high physical preparedness.

Presentation of basic material. Results of the conducted experiment are compared to the definition of the optimal parameters of activity of female students that have different levels of motor qualities development are presented in this publication. For example, Table 1 shows the average results of multiple performance of different motor tasks given to female students who have participated in the experimental study. As seen from the table, the experiment involved two groups with 28 students with low and high level of physical preparedness.

Table 1 Indicators of muscle performance in female students with low and high level of motor qualities development with repeated performance of exercises in different directions. ($\bar{X} \pm \sigma$).

№	type of exercise	level	The results of the exercise					
			number of attempts					
			1	2	3	4	5	6
1	30 m immediate run (s)	L	5,30 ± 0,17	5,41 ± 0,20	5,82 ± 0,31	6,38 ± 0,25	-	-
		H	4,91 ± 0,20	4,88 ± 21	4,94 ± 0,22	5,09 ± 0,24	5,21 ± 0,20	5,78 ± 0,18
2	Lifting torso to supine position by lying on back (№ of times)	L	20,17 ± 2,41	18,67 ± 2,03	16,12 ± 2,11	-	-	-
		H	28,4 ± 2,33	27,8 ± 2,22	25,13 ± 2,18	24,21 ± 2,12	22,1 ± 2,11	-
3	jumping after sitting down for 20 seconds (№ of times)	L	17,71 ± 1,68	16,84 ± 1,51	14,73 ± 1,38	-	-	-
		H	19,70 ± 1,82	19,67 ± 1,83	17,74 ± 1,61	15,4 ± 1,44	-	-
4	pull-ups on the low crossbar from lying position (№ of times)	L	4,01 ± 1,17	3,76 ± 1,38	2,93 ± 1,11	1,61 ± 0,42	-	-
		H	7,10 ± 1,68	6,45 ± 1,57	4,48 ± 1,11	4,02 ± 1,12	2,04 ± 0,87	-
5	Five-minute run with measurement of passed distance (m)	L	932,63 ± 38,2	833,42 ± 36,3	731,7 ± 17,2	-	-	-
		H	1048,71 ± 43,5	998,47 ± 34,6	823,14 ± 32,01	-	-	-

L – low level, H – high level

3. RESULTS OF THE STUDY

The conducted research displays that speed qualities during repeated performance of 30 m immediate run are unequal among students with different levels of motor abilities development (this applies especially to allowable number of attempts and time to return the heart rate to the set value). These parameters laid worst result in students who have low level of preparedness. This fact indicates that the depletion of energy resources of organism in their case occurs faster despite the longer intervals of rest.

Determination of the optimal load parameters, designed to develop strength endurance was conducted with a test of an average tempo, by lifting the torso from the position of lying on back, hands behind head. Analysis of the exercise results dynamics shows that in the third approach, the number of lifts were down by 20.1%. The heart rate recovery time is established after the first and second attempts at 3.3 minutes, and increases to 4.5 minutes after the third repetition.

The Study of dynamics of manifestation speed-power characteristics under repeated execution from the start position, by sitting down for 20 seconds, changes in study indicators as follows. From attempt to attempt, the number of tests decreases and finally in the third approach is decreased by 16.8%. The time of heart rate returns to initial state successively increases from 3.9 minutes to 6.0 minutes.

In strength exercises - pull-ups on the low crossbar from lying position – the test results have already in the second attempt began to deteriorate and in the fourth approach were decreased by 60%. However, the heart rate recovery time between repetitions did not increase, and it was 3.1 ... 3.2 minutes. External signs of tiredness

have not been observed. This fact gives grounds to assume that during the development of strength capabilities of girls with low level of physical preparedness, performance of exercises may possibly "fail".

On the model of repeated five-minute run with overcome distance measurement at that time, the distance determines the optimal activity parameters aimed at the development of endurance (Table 2).

The results of the experiment show that students in the first attempt ran on average 940.75, 40.3 m. In the second run the number of meters passed decreased by 10.7%, while in the third run it was reduced by 21.6%. Exercise repetition started at the time of the heart rate reduction to 120 beats a minute. The heart rate recovery time was established: after the first run in 6.5 minutes; after the second in 7.1 minutes, and after the third in 8.0 minutes. Therefore, in students with a high level of physical preparedness the results in the first five runs practically did not decrease. Meanwhile, in girls with low level of preparedness indicators deteriorate already in the second run.

Occasionally, we can observe that differences in the level of motor qualities development impose a mark on the nature of indicators change of physical performance. Physical performance seems integrative expression of human capabilities, included in the concept of health and is characterized by a number of objective factors. These include physique and anthropometric characteristics: capacity and efficiency of energy production mechanisms by aerobic and anaerobic way; strength and endurance of muscles, neuromuscular coordination; the state of the musculoskeletal system; neuroendocrine regulation of energy production processes as well as the use of the available energy in the body; mental state.

Table 2 Indicators of heart rate resumption to fixed values by repeating exercises on female students with low and high level of motor qualities development ($\bar{X} \pm \sigma$)

№	type of exercise	Fixed heart rate (beats/min.)	level	Heart rate recovery time (s)				
				number of attempts				
				1	2	3	4	5
1	30 m immediate run (s)	100 - 110	L	230,76±14,58	229,14±14,40	239,17±14,23	325,18±15,33	-
			H	211,44±13,49	221,71±14,01	229,37±14,53	307,21±14,83	319,37±14,71
2	The rise of the torso to supine position, hands behind head	115 - 120	L	198,36±12,15	198,08±12,09	272,24±12,08	-	-
			H	147,3 ± 12,21	148,69±12,31	156,43±12,44	168,71±12,51	172,44±12,49
3	jumping after sitting down for 20 seconds (№ of times)	115 - 120	L	239,32±18,33	262,64±17,28	358,28±17,73	-	-
			H	157,31±12,4	161,48±12,43	170,69±13,12	-	-
4	pull-ups on the low crossbar from lying position (№ of times)	100 - 110	L	186,36±9,69	185,59±9,60	191,67±10,18	186,58±10,42	-
			H	154,73±10,48	150,37±10,71	155,72±10,58	161,77±11,41	168,91±11,63
5	Five-minute run with measurement of passed distance (m)	120 - 125	L	388,45±21,88	428,54±21,63	484,69±23,76	-	-
			H	328,43±17,59	359,44±17,84	391,53±18,7	-	-

L – low level, H – high level

Thus, the observed differences in the physical fitness of female students allow to verify the assumption about the heterogeneity of the studied population.

[5] Volkov, V.L.: Basic theory and methods of physical training students: teach. manual [for college students], K.: Education of Ukraine, 2008, 256 p.

4. CONCLUSION

The results lead to the following conclusions:

1. Differences in quantitative and qualitative indicators discovered by the research that characterize the physical preparedness of students, determine the need of pedagogical model development that would individualize training types, aimed at the development and correction of basic motor skills.

2. The importance of rational normalization of work and rest regime with reusable repetitions of exercise is to identify the optimal number of repetitions of exercise and rest intervals between them. Doing so, we will enable effectively planning of individual load, make the adjustments by changing the level of physical preparedness and finally, not to exceed the adaptive capacities of the organism.

5. REFERENCES

- [1] Apanasenko, G.L.; Apanasenko, G. L.; Popov, L. A.: Medical valueology, Rostov n/D: Phoenix, 2000. - 248 p
- [2] Bondar, I.: Definition of physical qualities of students / Youth problems in Ukraine: State and solutions. - Lviv: LDIFK, 1997. - S.5-8.
- [3] Krutsevich, T.Y.; Sparrows, M.I.: Control in the physical education of children, adolescents and young adults. K., 2005. - 180 p.
- [4] Shiyani, B.M.; Paputa, V. G.; Pristupa, E. N.: Theory of Physical Education, LONMID. 1996. - 220 p.

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