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Methodology for the development of physical fitness of schoolchildren aged 13-15 years in the process of extracurricular activities

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Abstract

Purpose: To develop a methodology for the development of physical fitness of schoolchildren in the process of extracurricular activities.

Methods: To solve the research tasks, the following research methods were used: the study and analysis of scientific literature and articles published in periodicals, questionnaires, pedagogical observation, pedagogical control tests, teaching experience, mathematical and statistical research results.

Results: After six months of pedagogical experiments, the final test results of schoolchildren showed that the physical fitness of boys and girls of the experimental group has significantly improved. For example, for boys aged 13-15, the result in running at 60 m was 5.6–6.5%; long jump from a standing position 3.07-5.1%; throwing a tennis ball - 10.6-12.2%; Running at 2000 m by 4.01-7.2%; For girls aged 13-15, the result in running at 60 m was 5.3-6.7%; long jump from a standing position 4.1-6.6%; throwing a tennis ball - 12.7-17.03%; In running at 2000 m, the result increased from 3.3% to -4.8% .

Conclusion: Physical fitness of schoolchildren aged 13-15 was studied using tests. The results obtained at the beginning and at the end of the pedagogical experiment are analyzed. A program of extracurricular activities for the development of physical fitness of schoolchildren aged 13-15 years on the basis of general physical means has been developed and successfully tested.

Keywords: Schools, students, tests, rules, norms, experience, control, program, analysis, degree, physical development, result, system, extracurricular activities, physical training.

Introduction

One of the tasks facing the leadership of our state is to modernize the system of development of physical culture and mass sports.

A decrease in the level of physical and functional fitness of pupils has been recognized in many studies as having a significant impact on the successful implementation of certain standards of physical fitness (Izotova, 2015; Rasulov, 2008). Most schoolchildren do not engage in other types of physical activity for various reasons, including economic reasons, in addition to regular physical education (Salomov, 2015; Yunusova, 2005). According to experts, the physical education curriculum does not set itself the task of preparing students for the standards of the physical education program.

Every teacher relies on the curriculum and personal experience in their work to improve the physical fitness of students. In addition, materials on self-preparation for extracurricular activities are limited to general information.

Extracurricular activities (optional classes) are part of the educational process. Extracurricular physical education classes differ from academic ones in that such classes are not limited in time, the number of students is not limited by age and are voluntary. The content and forms of extracurricular activities are determined taking into account the individual interests of students and the existing conditions in a comprehensive school. Classes are held in accordance with the program of extracurricular physical education and recreation activities of students (optional classes) (Salomov, 2015).

Today there is such a contradiction that although all conditions have been created for pupils to participate in the implementation of testing standards in the program, there are no specially developed programs to prepare these standards for the task.

Also, the problematic situation associated with their low level of physical fitness in preparing schoolchildren for the implementation of testing standards reflects, on the one hand, the need of society for physically healthy and prepared schoolchildren, on the other - insufficient methodological support for physical training and education in secondary schools.

Thus, the lack of methods for developing physical fitness of schoolchildren through extracurricular activities determines the relevance of the chosen research topic.

Methods

In the experimental group, extracurricular activities were conducted on the basis of the methodology of performing exercises aimed at improving the physical fitness of schoolchildren aged 13-15 years with different physical fitness and assistance in passing control papers.

In the experimental group, classes were conducted in accordance with the extracurricular curriculum developed for passing the testing standards, and in the control group, classes were conducted according to the traditional methodology.

Results and discussion

In the course of the study, tests were taken from schoolchildren aged 13-15 according to the testing standards adopted at the Athletics Department in the physical education program to determine their physical fitness. At the end of the testing, 13-15-year-olds with the same physical fitness were selected for the experimental and control groups (180 in total, of which boys - 90, girls - 90). A group of 15 boys and 15 girls was formed in each age group.

Preliminary results showed that when comparing the indicators of physical fitness of boys and girls in the experimental and control groups by age and gender, significant differences between the groups were not essential, and students with physical development and functional fitness were selected to participate in them. pedagogical research process. After six months of training, there was a difference between the results obtained in boys and girls in the experimental and control groups.

In 13-year-old boys of the experimental group, indicators increased as below, the average value in the 60 m run ranged from 10.4±0.68 s to 9.8±0.67 s ($P<0.05$); long jump from a standing position ranged from 162.7±4.32 cm to 167.7±4.47 cm ($P<0.05$); throwing a tennis ball ranged from 33.69±2.45 m to 37.55±2.3 m ($P<0.05$); 2000 m running ranged from 10.51±0.55 minutes to 10.08±0.39 minutes ($P<0.05$); leaning forward from a sports chair without bending at the knees ranged from 3.3±1.05 cm to 4.4±0.99 cm ($P<0.05$); pull ups ranged from 4±0.85 times to

Table 1. Indicators of boys aged 13-15 years in the experimental and control groups (before and after the experiment).

№	Tests	Age	Indicators (EG)		t	P	Indicators (CG)		t	P
			Before the experiment n=15 $\bar{x}\pm\sigma$	After the experiment n=15 $\bar{x}\pm\sigma$			Before the experiment n=15 $\bar{x}\pm\sigma$	After the experiment n=15 $\bar{x}\pm\sigma$		
1	Running at 60 (m)	13	10.4±0.68	9.8±0.67	2.35	<0.05	10.3±0.58	10.2±0.57	0.7	>0.05
		14	10.1±0.6	9.5±0.61	2.4	<0.05	10.2±0.77	10.01±0.78	0.68	>0.05
		15	9.79±0.71	9.15±0.55	2.76	<0.05	9.76±0.76	9.6±0.73	0.58	>0.05
2	Long jump from a standing position (sm)	13	162.7±4.32	167.7±4.47	3.11	<0.05	162.1±4.66	164.1±4.66	1.19	>0.05
		14	164.3±6.11	170.5±6.57	2.65	<0.05	165.1±5.55	167.7±5.55	1.28	>0.05
		15	167.3±5.01	175.8±5.07	4.6	<0.05	167.5±5.22	171.7±5.41	2.12	<0.05
3	Throwing a tennis ball (m)	13	33.69±2.45	37.55±2.3	4.31	<0.05	33.68±3.59	35.22±3.76	1.14	>0.05
		14	33.99±5.6	38.14±5.36	2.08	<0.05	33.51±4.97	35.53±4.98	1.11	>0.05
		15	35.64±4.32	39.42±4.45	2.35	<0.05	35.76±3.84	37.8±3.88	1.45	>0.05
4	Running on 2000 meters (minutes and seconds)	13	10.51±0.55	10.08±0.39	2.47	<0.05	10.52±0.54	10.38±0.5	0.72	>0.05
		14	10.48±0.4	10.06±0.38	2.97	<0.05	10.47±0.43	10.29±0.41	1.11	>0.05
		15	10.26±0.43	9.52±0.3	5.43	<0.05	10.24±0.51	10.0±0.42	1.41	>0.05
5	Leaning forward from a sports chair without bending at the knees (sm)	13	3.3±1.05	4.4±0.99	2.87	<0.05	3.5±0.99	4.1±0.99	1.66	>0.05
		14	3.7±0.96	4.7±0.9	2.74	<0.05	3.9±0.92	4.3±0.82	1.47	>0.05
		15	4.3±0.96	5.2±0.94	2.69	<0.05	4.3±1.11	4.6±0.99	0.69	>0.05
6	Pull-ups (times)	13	4±0.85	5±0.85	3.24	<0.05	4±0.65	4.4±0.74	1.57	>0.05
		14	4.6±1.3	5.5±1.1	2.1	>0.05	4.4±1.12	4.9±1.1	1.14	>0.05
		15	4.7±1.03	5.7±1.11	2.38	<0.05	4.8±1.15	5.1±1.25	0.76	>0.05

5±0.85 times, and there were significant statistical differences (P<0.05).

Also in 13-year-old boys of the control group, indicators increased as below, the average value in the 60 m run ranged from 10.3±0.58 s to 10.2±0.57 s (P>0.05); long jump from a standing position ranged from 162.1±4.66 cm to 164.1±4.66 cm (P>0.05); throwing a tennis ball ranged from 33.68±3.59 metres to 35,22±3,76 metres (P>0.05); 2000 m running ranged from 10.52±0.54 minutes to 10.38±0.5 minutes (P>0.05); leaning forward from a sports chair without bending at the knees ranged from 3.5±0.99 cm to 4.1±0.99 cm (P>0.05); pull ups ranged from 4±0.65 times to 4.4±0.74 times but there were no significant statistical differences (P>0.05).

In 14-year-old boys of the experimental group, indicators increased as below, the average value in the 60 m run ranged from 10.1±0.6 s to 9.5±0.61 s (P<0.05); long jump from a standing position ranged from 164.3±6.11 cm to 170.5±6.57 cm (P<0.05); throwing a tennis ball ranged from 33.99±5.6 m to 38.14±5.36 m (P<0.05); 2000 m running ranged from 10.48±0.4 minutes to 10.06±0.38 minutes (P<0.05); leaning forward from a sports chair without bending at the knees ranged from 3.7±0.96 cm to 4.7±0.9 cm (P<0.05); pull ups ranged from 4.6±1.3 times to 5.5±1.1 times and there were significant statistical differences (P<0.05).

Also in 14-year-old boys of the control group, indicators increased as below, the average value in the 60 m run ranged from 10.2±0.77 s to 10.01±0.78 s (P>0.05); long jump from a standing position ranged from 165.1±5.55 cm to 167.7±5.55 cm (P>0.05); throwing a tennis ball ranged from 33.51±4.97 m to 35.53±4.98 m (P>0.05); 2000 m running ranged from 10.47±0.43 minutes to 10.29±0.41 minutes (P>0.05); leaning forward from a sports chair without bending at the knees ranged from 3.9±0.92 cm to 4.3±0.82 cm (P>0.05); pull ups ranged from 4.4±1.12 times to 4.9±1.1 times but there were no significant statistical differences (P>0.05).

In 15-year-old boys of the experimental group, indicators increased as below, the average value in the 60 m run ranged from 9.79±0.71 s to 9.15±0.55 s (P<0.05); long jump from a standing position ranged from 167.3±5.01 cm to 175.8±5.07 cm (P<0.05); throwing a tennis ball ranged from 35.64±4.32 m to 39.42±4.45 m (P<0.05); 2000 m running ranged from 10.26±0.43 minutes to 9.52±0.3 minutes (P<0.05); leaning forward from a sports chair without bending at the knees ranged from 3.7±0.96 cm to 4.7±0.9 cm (P<0.05), pull ups ranged from 4.6±1.3 times to 5.5±1.1 times but there were no significant statistical differences (P>0.05).

Also in 15-year-old boys of the control group, indicators increased as below, the average value in the 60 m run ranged from 9.76±0.76 s to 9.6±0.73 s and there were no significant statistical differences (P>0.05). Long jump from a standing position ranged from 167.5±5.22 m to 171.7±5.41 m and there were significant statistical differences (P<0.05); throwing a tennis ball ranged from 35.76±3.84 m to 37.8±3.88 m (P>0.05); 2000 m running ranged from 10.24±0.51 minutes to 10.0±0.42 minutes (P>0.05); leaning forward from a sports chair without bending at the knees ranged from 4.3±1.11 cm to 4.6±0.99 cm (P>0.05); pull ups ranged from 4.8±1.15 times to 5.1±1.25 times but there were no significant statistical differences (P>0.05).

The results of physical education of boys of the experimental group obtained at the end of the pedagogical experiment described above and presented in Table 4.1 clearly show that their level of physical fitness has significantly and significantly improved.

During the pedagogical experiment, extracurricular classes were organized with boys of the experimental group according to the method of rotation and group training, taking into account sensitive periods. As a result, the boys of the experimental group received higher results than their peers from the control group who participated in extracurricular activities based on the results of the control tests.

During the experiment, the experimental group used the “Curriculum of classes on the development of physical fitness of schoolchildren in the process of extracurricular activities” using generally accepted means of physical education of boys. Unambiguously reliable results were observed for 6 out of 6 tested indicators of the experimental group. Only in 1 age group, a significant increase in results was observed in 14-year-olds in the pull-up test on the horizontal bar, but there were no significant statistical differences (P>0.05).

We will also consider in detail the average indicators of young people obtained by comparative analysis of the average values of the results of control tests characterizing the

Table 2. Indicators of girls aged 13-15 years in the experimental and control groups (before and after the experiment).

№	Tests	Age	Indicators (EG)		t	P	Indicators (CG)		t	P
			Before the experiment n=15 $\bar{x} \pm \sigma$	After the experiment n=15 $\bar{x} \pm \sigma$			Before the experiment n=15 $\bar{x} \pm \sigma$	After the experiment n=15 $\bar{x} \pm \sigma$		
1	Running at 60 (m)	13	11.3±0.47	10.5±0.48	4.36	<0.05	11.3±0.47	11.01±0.46	1.59	>0.05
		14	11.4±0.28	10.8±0.21	6.57	<0.05	11.4±0.3	11.2±0.31	2.25	<0.05
		15	11.2±0.25	10.6±0.2	7.25	<0.05	11.2±0.25	10.9±0.26	2.67	<0.05
2	Long jump from a standing position (sm)	13	155.9±5.1	164.2±4.46	4.76	<0.05	155.9±4.88	159.7±4.73	2.13	<0.05
		14	162.4±3.6	170.9±3.97	5.25	<0.05	162.9±4.17	166±3.8	2.15	<0.05
		15	164.7±4.1	171.4±2.8	5.25	<0.05	164.3±3.56	167.5±3.42	2.51	<0.05
3	Throwing a tennis ball (m)	13	23.9±3.03	27.8±3.21	3.39	<0.05	23.7±3.05	25.5±3.23	1.57	>0.05
		14	24.3±2.74	28.43±2.93	4	<0.05	24.35±2.75	26.67±2.61	2.38	<0.05
		15	25.62±2.47	29.53±2.55	4.25	<0.05	25.52±2.23	27.36±2.24	2.26	<0.05
4	Running on 2000 meters (minutes and seconds)	13	12.34±0.25	11.94±0.37	3.51	<0.05	12.29±0.26	12.13±0.3	1.56	>0.05
		14	12.05±0.25	11.52±0.24	5.91	<0.05	12.03±0.31	11.85±0.35	1.52	>0.05
		15	12.02±0.22	11.44±0.17	8.05	<0.05	12.02±0.22	11.68±0.27	3.84	<0.05
5	Leaning forward from a sports chair without bending at the knees (sm)	13	4.2±0.86	5.1±0.8	2.85	<0.05	4.2±0.86	4.3±0.9	0.41	>0.05
		14	4.8±1.01	5.4±0.99	1.64	<0.05	4.8±1.01	5.1±0.69	0.74	>0.05
		15	5.2±0.86	5.9±0.8	2.42	<0.05	5.3±0.8	5.5±0.83	0.89	>0.05
6	Push-ups (times)	13	4.3±0.82	5.3±0.82	3.35	<0.05	4.3±0.82	4.6±0.91	0.84	>0.05
		14	4.7±0.98	5.4±0.91	2.13	<0.05	4.7±0.98	4.7±1.1	0.18	>0.05
		15	5.1±0.83	5.9±0.88	2.55	<0.05	5.3±0.9	5.5±0.74	0.44	>0.05

level of physical fitness of girls of the experimental group after pedagogical experience. (see table 2)

Average indicators in girls of the 13-year-old experimental group for the period of the pedagogical experiments in 60 m run ranged from 11.3±0.47 s at the beginning to 10.5±0.48 s at the end and there were significant statistical differences (P<0.05). In control group results ranged from 11.3±0.47 s to 11.01±0.46 s but there were no significant statistical differences (P>0.05).

Long jump from a standing position in experimental group ranged from 155.9±5.1 cm to 164.2±4.46 cm (P<0.05); throwing a tennis ball ranged from 23.9±3.03 m to 27.8±3.21 m (P<0.05); 2000 m running ranged from 12.34±0.25 minutes to 11.94±0.37 minutes (P<0.05); leaning forward from a sports chair without bending at the knees ranged from 4.2±0.86 cm to 5.1±0.8 cm (P<0.05); push-ups ranged from 4.3±0.82 times to 5.3±0.82 times and there were significant statistical differences (P<0.05).

Long jump from a standing position in control group ranged from 155.9±4.88 cm to 159.7±4.73 cm (P<0.05); throwing a tennis ball ranged from 23.7±3.05 m to 25.5±3.23 m (P>0.05); 2000 m running ranged from 12.29±0.26 minutes to 12.13±0.3 minutes (P>0.05); leaning forward from a sports chair without bending at the knees ranged from 4.2±0.86 cm to 4.3±0.9 cm (P>0.05); push-ups ranged from 4.3±0.82 times to 4.6±0.91 but there were no significant statistical differences (P>0.05).

Average indicators in girls of the 14-year-old experimental group results in 60 m run ranged from 11.4±0.28 s to 10.8±0.21 s (P<0.05); in control group results were 11.4±0.3 s to 11.2±0.31 s and there were significant statistical differences (P<0.05).

Long jump from a standing position in EG ranged from 162.4±3.6 cm to 170.9±3.97 cm (P<0.05). CG: 162.9±4.17 cm to 166±3.8 cm (P<0.05); throwing a tennis ball in EG ranged from 24.3±2.74 m to 28.43±2.93 m / P<0.05 /; in CG 24.35±2.75 m to 26.67±2.61 m and there were significant statistical differences (P<0.05).

In EG 2000 m running ranged from 12.34±0.25 minutes to 11.94±0.37 minutes (P<0.05); In CG 12.29±0.26 minutes to 12.13±0.3 minutes (P>0.05); leaning forward from a sports chair without bending at the knees ranged from 4.8±1.01 cm to 5.4±0.99 cm (P<0.05); in CG ranged from 4.8±1.01 cm to 5.1±0.69 cm (P>0.05); in EG push-ups ranged from 4.7±0.98 times to 5.4±0.91 times and there were significant statistical differences (P<0.05); in CG push-ups ranged from 4.7±0.98 times to 4.7±1.1 times (P>0.05).

Average indicators in girls of the 15-year-old in experimental group results in 60 m run ranged from 11.2±0.25 s to 10.6±0.2 s. in control group results were 11.2±0.25 s to 10.9±0.26 c and there were significant statistical differences (P<0.05).

Long jump from a standing position in EG ranged from 164.7±4.1 cm to 171.4±2.8 cm; in CG ranged from 164.3±3.56 cm to 167.5±3.42 cm (P<0.05).

Throwing a tennis ball in EG ranged from 25.62±2.47 m to 29.53±2.55 m; in CG ranged from 25.52±2.23 m to 27.36±2.24 m (P<0.05).
In EG 2000 m running ranged from 12.34±0.25 minutes to 11.94±0.37 minutes (P<0.05); in CG ranged from 12.29±0.26 minutes to 12.13±0.3 minutes (P>0.05).

In EG leaning forward from a sports chair without bending at the knees ranged from 5.2±0.86 cm 5.9±0.8 to cm (P<0.05); push-ups ranged from 5.1±0.83 times to 5.9±0.88 times and there were significant statistical differences (P<0.05).

In CG leaning forward from a sports chair without bending at the knees ranged from 5.3±0.8 cm to 5.5±0.83 cm (P>0.05); push-ups ranged from 5.3±0.9 times to 5.5±0.74 times but there were significant statistical differences (P>0.05).

During the pedagogical experiment in extracurricular classes, classes were organized using the methodology of turnover and group training, taking into account the sensitive periods of the experimental group with girls. As a result, the girls of the experimental group achieved a higher result than their peers from the control group who were engaged in non-traditional extracurricular education based on the results of the control tests.

During the period of this experiment, the girls of the experimental group, using general means of physical training, used the "Curriculum of the course of measures for the development of physical training of schoolchildren in the process of extracurricular training". In the Experimental group, 6 out of 6 tested indicators for all age groups showed clear reliable results (P<0.05). According to the results of the tests in the girls of the control group, from 6 tests to 4 tests, there was a significant increase in the results of girls aged 14-15 years in running 60 m, long jump from a standing position 13,14-15 years, throwing a tennis ball up to 14-15 years, and in running 2000 m only 15 years (P<0.05).

Conclusion

Based on the "Curriculum of the activity course on the development of physical culture of schoolchildren in the process of extracurricular activities" developed by us, the positive impact of classes on the indicators of physical fitness of students was determined. The traditional system of physical education in secondary schools is not able to provide the necessary amount of motor activity of students. During the experiment, the level of physical fitness of schoolchildren aged 13-15 was determined and, based on the results, the training was rated below average.

The general physical training of students was improved with the help of special sets of exercises taking into account physical qualities that lagged in the development of students in extracurricular activities. This approach to the organization of the pedagogical process confirmed the effectiveness of the developed methodology.

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