



Development of speed and strength abilities of schoolchildren through circuit training

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Abstract: The article describes a technique that allows for rapid mobility improvement based on sensitive periods at a primary school age. The developed technique can be used to increase mobility of 9-10 years old children both in physical education lessons and sport clubs as well.

Keywords: mobility, circular training exercises, sensitive periods, primary school age, Physical Education lessons.

Introduction: In all socially and economically developed countries, priorities to organize leisure time of the youth practically, to strengthen their health and to prepare brighter youth for good prospects are achieved by physical education lessons and sport. In addition, special attention is paid to improve the general physical training of children, the formation of the necessary mobility skills, the development of their physical abilities, and comprehensive development of the child's personality. Targeted physical development of school-age children is especially important.

Based on world leading practices, techniques for further development of primary education, improving the system of physical education, increasing the efficiency of physical activity and effective organization in sport lessons at school are developed. Scientific studies have been carried out on the practical usage of tools and techniques for comprehensive development of the qualities necessary for the physical well-being of school-age children, as well as on the development of various forms to enhance their physical development and functional training [2]. Taking into account of their sensitive periods, numerous studies have been conducted on the development of physical abilities of primary school children, selective techniques for the rapid development of mobility skills and physical qualities.

At present, large-scale projects are being carried out in our country aimed at regular training of young generation to refine physical education and sports. The most important aim of the education system in our Republic is to provide the younger generation with a solid education and to bring them up as physically and spiritually smart and intelligent generation [1]. In spite of the high state-level emphasis on the education system, the current condition of physical education in secondary schools remains one of the most worrying issues in education. The course process of Physical Education lessons introduced in the traditional system is not perfect, that is, does not fully meet the demands of the growing organism [2,5].

Effective use of sensitive steps to fill this gap enables the body to realize its numerous capabilities to the full and develop certain physical qualities. Since speed is the most difficult skill to develop, it is important to pay special attention to the targeted use of sensitive periods for rapid development [4]. Therefore, the solution of the problem of improving the learning process targeted at mobility development in primary school physical education lessons is still worrying.

Purpose of the study. The develop techniques of improving mobility in physical education lessons of sensitive primary school-age children by circular training exercises.

Research methods. The improved method of holding lessons in the open air and indoor control of physical training lessons aimed to improve the mobility of elementary school children during the is sensitive period was Implemented and introduced in secondary school.

1. The results of the study and their discussion.

Prior to the tests, the students were informed about the purpose of the test, they were shown examples and explained how to do the test in detail.

Pupils in the experimental group completed a set of specific circular training exercises to improve the mobility within the set of exercises both during the course preparation and in the main part of the course. The newly-developed technique involves the exercise of one or two series of exercises with an extensive-interval circular training method. One circular training includes 8 sets. Each exercise was spent on the same 15 seconds and the rest interval was 30 seconds. Duration of this method is a minimum of 8 lessons, 2 consecutive lessons per week, which is considered a completed cycle for an extensive interval method. The number of cycles during the school year is min 3, max 4.

The circular training set includes the following exercises:

Exercise 1. Running, staying on the same position (the performer tries to rotate his knees as often as possible on a rope hanging horizontally at the height of his thigh at right angles).

Exercise 2. Jumping on right and left feet with great intensity as if you were rope jumping, hands are on the waist.

Exercise 3. Bending and lifting the back, with the body lying on the back (the performer tries to act as fast as possible, with the legs locked at the knees at first).

Exercise 4. Running, feet should meet the back of the hips (the palms of your leg should touch with the back of your hip muscles as much as possible).

Exercise 5. Lying on the back, leaning on something (f.p. standing straight, leaning-sitting, leaning-lying, leaning-sitting, return to the first position)

Exercise 6. Jump up (the first position is sitting on locked knees and you should jump up the front keeping the body straight up.

Exercise 7. F.p.- the right foot is on the seat, the arms are on the waist (after the start, he should jump up with force , touching the feet on the seat alternatively, the shoulders are held straight, the pushing leg fully adjusted).

Exercise 8. Running staying on the same position-Leaning on the hands - (after the start f.p. the performer runs from the position, the whole body leans on the hands, the face is kept straight up.

In order to determine the effectiveness of the developed methodology, a pedagogical experiment was conducted at the secondary school N29 in Karshi to increase mobility of primary school children(9-10 years old third-grade pupils) in the learning process. All study participants were divided into two groups: EG - experimental group and CG - control group. The number of children in the groups was equal and the same number of children participated both in the "EG" and "CG". In the control group, the physical education classes were conducted by a physical education teacher based on the traditional school curriculum. In the experimental group, a teacher conducted that lesson, using the new methodology developed and proposed by us.

As a result of the pedagogical experiment, it was found that young children in the CG had slightly improved their performance in terms of physical training during the pedagogical experiment, however statistics on all studied indicators did not show reliable changes ($p > 0.05$) (Look at Table N1).

Table N1
Dynamics of physical training indicators of Control group children
[n=b-15; g-15]

T/ p	Control tests	Before the Experiment	V%	After the Experiment	V%	t	p
		$\bar{x} \pm \sigma$		$\bar{x} \pm \sigma$			
1.	30m Running, sec	$\frac{5,8 \pm 0,24}{6,1 \pm 0,26}$	$\frac{4,1}{4,3}$	$\frac{5,7 \pm 0,21}{6,0 \pm 0,24}$	$\frac{3,7}{4,0}$	$\frac{1,21}{1,09}$	$\frac{> 0,05}{> 0,05}$
2.	High Jump (Abalakov length), cm	$\frac{25,3 \pm 2,8}{21,8 \pm 2,3}$	$\frac{11,1}{13,3}$	$\frac{26,7 \pm 2,4}{23,3 \pm 1,9}$	$\frac{9,0}{8,1}$	$\frac{1,47}{1,68}$	$\frac{> 0,05}{> 0,05}$
3.	Long jump from the position, cm	$\frac{135,9 \pm 3,6}{128,4 \pm 4,1}$	$\frac{2,6}{3,2}$	$\frac{137,3 \pm 3,2}{130,1 \pm 3,8}$	$\frac{2,5}{2,9}$	$\frac{1,13}{1,18}$	$\frac{> 0,05}{> 0,05}$
4.	Throwing stuffed ball (1kg), cm	$\frac{294 \pm 22,6}{286 \pm 18,2}$	$\frac{7,7}{6,4}$	$\frac{301,1 \pm 24,3}{293,0 \pm 16,4}$	$\frac{8,1}{5,6}$	$\frac{0,83}{1,09}$	$\frac{> 0,05}{> 0,05}$
5.	Rope jumping, times	$\frac{11,1 \pm 1,5}{13,6 \pm 1,2}$	$\frac{13,5}{8,8}$	$\frac{11,5 \pm 1,2}{14,1 \pm 0,8}$	$\frac{10,4}{5,7}$	$\frac{0,81}{1,34}$	$\frac{> 0,05}{> 0,05}$
6.	Jingle jangle running 3x10 m, sec	$\frac{9,8 \pm 0,24}{10,1 \pm 0,22}$	$\frac{2,4}{2,2}$	$\frac{9,7 \pm 0,20}{10,0 \pm 0,26}$	$\frac{2,1}{2,6}$	$\frac{1,24}{1,14}$	$\frac{> 0,05}{> 0,05}$

Note N1. Boys' results were shown in the numerators, girls' in denominators.

The physical training levels of EG boys and girls show that their level of physical training improved significantly and reliably ($p < 0.01$) (Look at Table N2).

Table N2
Dynamics of physical training indicators of Experiment group children
[n=b-15; g-15]

T/ p	Control tests	Before the Experiment	V%	After the Experiment	V%	T	p
		$\bar{x} \pm \sigma$		$\bar{x} \pm \sigma$			
1.	30m Running, sec	$\frac{5,9 \pm 0,26}{6,2 \pm 0,30}$	$\frac{4,4}{4,8}$	$\frac{5,5 \pm 0,12}{5,8 \pm 0,20}$	$\frac{2,2}{3,5}$	$\frac{5,41}{4,30}$	$\frac{< 0,01}{< 0,01}$
2.	High Jump (Ablakov length), cm	$\frac{26,8 \pm 2,8}{22,6 \pm 3,1}$	$\frac{10,4}{13,7}$	$\frac{35,6 \pm 2,2}{33,6 \pm 1,7}$	$\frac{6,1}{5,0}$	$\frac{9,57}{12,0}$	$\frac{< 0,01}{< 0,01}$
3.	Long jump from the position, cm	$\frac{134,1 \pm 4,2}{126,1 \pm 6,1}$	$\frac{3,1}{4,8}$	$\frac{151,6 \pm 3,4}{148,6 \pm 4,2}$	$\frac{2,2}{2,8}$	$\frac{12,5}{11,8}$	$\frac{< 0,01}{< 0,01}$
4.	Throwing stuffed ball (1kg), cm	$\frac{291,1 \pm 17,8}{283,0 \pm 12,8}$	$\frac{6,1}{4,5}$	$\frac{337,0 \pm 13,7}{329,1 \pm 10,4}$	$\frac{8,1}{5,6}$	$\frac{7,91}{10,8}$	$\frac{< 0,01}{< 0,01}$
5.	Rope jumping, times	$\frac{11,2 \pm 1,4}{13,2 \pm 1,1}$	$\frac{12,5}{8,3}$	$\frac{14,4 \pm 1,0}{15,4 \pm 0,7}$	$\frac{6,9}{4,5}$	$\frac{7,20}{6,53}$	$\frac{< 0,01}{< 0,01}$

6.	Jingle jangle running 3x10 m, sec	$\frac{9,9 \pm 0,28}{10,2 \pm 0,27}$	$\frac{2,8}{2,6}$	$\frac{8,8 \pm 0,11}{9,1 \pm 0,17}$	$\frac{1,2}{1,8}$	$\frac{14,2}{13,3}$	$\frac{< 0,01}{< 0,01}$
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Note N2. Boys' results were shown in the numerators, girls' in denominators.

There was a significant increase in results for two figures: tennis ball throwing and six-minute running, but no reliable statistical differences ($p > 0.05$). Actually, throwing a tennis ball away describes strength levels and a six-minute running shows durability. However, our method is designed to improve the mobility using extensive interval techniques and the absence of reliable statistical differences in control measurements is explained by this.

Conclusions. As a result of the pedagogical experiment, enough data were obtained to evaluate the proposed methodology for increasing mobility targeted at improvements of physical readiness of young children.

Having analyzed all figures, we can conclude that the traditional method of physical education lessons has insignificant impact on the general physical fitness of young children.

The high effectiveness of the proposed methodology is confirmed by the results of the same measurements obtained from the figures of boys and girls. During the experiment, all of the indicators were confidently higher in the experimental method group than in the standard school program. This is a compelling argument in favor of the methodology developed to enable rapid development of primary school students' mobility through the use of sensitive periods.

The methodology for enhancing mobility based on the use of extensive circular training exercises can be used in physical education classes as well as in sports clubs to develop the mobility of school children aged 9-10.

The method, which allows primary school children to increase mobility, has proven to be more effective than traditional systems used in the general education curriculum and makes school lessons more effective. As a result, their overall physical fitness improved by 12.5%, physical development and functional training by 10.6%, and their speed and strength qualities increased by 8.2%, and their mobility increased by 15.2%.

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