

USAGE OF THE METHOD OF CHILD TRAINING FOR IMPROVING LESSONS OF PHYSICAL EDUCATION FOR CHILDREN OF 9–10 YEARS

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Abstracts

While exercising, there is a purposeful impact on the complex of body natural properties, which belongs to physical qualities of a person. Affecting physical qualities, under certain conditions, achieve a significant change of the level and direction of their development. In this regard, the aim of the research paper is to analyse the developed and scientifically grounded methods of circuit training for optimization of Physical Education lessons for primary school children. **The Purpose of the Study** – to elaborate and scientifically substantiate the training methods optimization of Physical Education lessons for primary school children. **Research Organization**, based on the fact, that 107 pupils of 9th–10th forms took part at the experiment. They were divided into experimental and control groups (experimental groups include 27 boys and 26 girls; control groups – 28 boys and 26 girls). The experiment was attended by 9–10 year-old boys and girls that were included to the main medical group. Results. The chosen tests were informative in order to the dynamics detection of the developed methods and gave a positive growth for both groups ($p < 0,05$; $p < 0,01$). But the best result was shown by the experimental group. Due to the fact that during the methodology construction, not only the sensitive development, but also those aspects that would motivate the children before classes, were taken into consideration. **Conclusions**. Data, obtained during the methodology implementation of the circuit training, proved the effectiveness of our methods, that used during the school year as a modernized tool for increasing the level of physical preparedness of primary school children.

Key words: methodology, circuit training, primary school children, younger age, physical abilities.

Людмила Шуба, Вікторія Шуба. Використання методу колового тренування для вдосконалення уроків фізичної культури в дітей 9–10 років. Під час занять фізичними вправами відбувається цілеспрямований вплив на комплекс природних властивостей організму, що належить до фізичних якостей людини. Впливаючи на фізичні якості, за певних умов досягають суттєвої зміни рівня й спрямованості їхнього розвитку. У зв'язку з цим у статті проведено аналіз розробленої та науково обґрунтованої методики колового тренування для оптимізації уроків фізичної культури дітей молодшого шкільного віку. **Організація дослідження.** Робота ґрунтувалася на тому, що в експерименті взяло участь 107 учнів 9–10 років, які поділені на експериментальні та контрольні групи (експериментальні групи – 27 хлопців, 26 дівчат; контрольні групи – 28 хлопців, 26 дівчат). В експерименті взяли участь хлопці й дівчата 9–10 років, які за станом здоров'я віднесені до основної медичної групи. **Результати.** Обрані тести для виявлення динаміки розробленої методики є інформативними й дали позитивний приріст в обох групах ($p < 0,05$; $p < 0,01$). Але найкращий результат показала експериментальна група, що пов'язано з тим, що під час побудови методики ми врахували не лише сенситивний розвиток, а ще й ті аспекти, які б мотивували учнів до занять. **Висновки.** Дані, отримані в процесі впровадження методики колового тренування, свідчать про ефективність розробленої нами методики, яка використовувалася протягом навчального року як модернізований засіб для підвищення рівня фізичної підготовленості учнів початкової школи.

Key words: методика, колове тренування, учні, молодший вік, фізичні здібності.

Людмила Шуба, Вікторія Шуба. Использование метода круговой тренировки для совершенствования уроков физической культуры у детей 9–10 лет. Во время занятий физическими упражнениями происходит целенаправленное воздействие на комплекс естественных свойств организма, что принадлежит к физическим качествам человека. Влияя на физические качества, при определенных условиях достигают существенного изменения уровня и направленности их развития. В связи с этим данная статья направлена на анализ разработанной и научно обоснованной методики – круговой тренировки для оптимизации уроков физической культуры детей младшего школьного возраста. **Организация исследования** базировалось на том, что в эксперименте приняли участие 107 учащихся 9–10 лет, которые разделены на экспериментальные и контрольные группы (экспериментальные – 27 ребят, 26 девушек; контрольные группы – 28 ребят, 26 девушек). В эксперименте приняли участие ребята 9–10 лет, которые по состоянию здоровья были отнесены к основной медицинской группе. **Результаты.** Выбранные тесты для выявления динамики разработанной методики были информативными и дали положительный прирост в обеих группах ($p < 0,05$; $p < 0,01$). Но наилучший результат показала экспериментальная группа, это связано с тем, что при построении методики мы учли не только сенситивное

развитие, но и аспекты, мотивирующие учащихся к занятиям. **Выводы.** Данные, полученные в процессе внедрения методики круговой тренировки, свидетельствуют об эффективности разработанной нами методики, которая использовалась в течение учебного года как модернизированное средство для повышения уровня физической подготовленности учащихся начальной школы.

Ключевые слова: методика, круговые тренировки, ученики, младший возраст, физические способности.

Introduction. Lately, during the practices of physical education, the central place is taken by the problems associated with the decrease in the activity of primary school children in educational activities, the slowing of their physical and mental development, the deterioration of health, and the low level of motivation to study, necessary for persistent, systematic educational work. Only a positive attitude towards learning can provide a complete mastery of a studying material [3; 9; 12].

Tasks solution of increasing the efficiency and the quality of the educational process is possible only due to the basis of further improvement of teaching methods of school subjects. One of them is physical education – a specific educational discipline that is important for every child, regardless of the chosen professional path in the future [3; 11]. Specific of physical education as a subject of study is that the main indicators of its effectiveness are the state of health and the level of physical fitness of pupils [4; 16].

At the lessons of physical culture, we use different methods of exercising and methods of organizing the activity. In each case, we apply a mode or method that most closely meets the objectives of the lesson, provides optimal physical activity and high density of the lesson. Among them, one can distinguish the method of circuit training, one of the most effective in organizing and teaching of primary school children [1; 4; 17].

The method of circuit training provides high motor density of the lesson and elevated emotional state of primary school children, allows to carry out a large amount of exercise, get a great deal of work and increase the level of physical fitness of pupils [6; 8].

The organizational and methodical form of lessons with physical exercises which corresponds to the modern method of circuit training was first used by English specialists R. Morgan and G. Adamson in order to increase the interest of pupils in the classes. They called this method «Circuit training». Subsequently, the method of circuit training called «kreistraining» has gained wide popularity in the former GDR and in other countries [5; 7; 17].

Numerous studies [2; 3] are devoted to the optimization of physical education in a primary school. However, one of the reasons for the poor state of the younger generation's health is the limited driving regime and the fact that the physical education program is implemented only by 50 percent as well as the aspect that pupils are not interested in attending the same lessons. In this regard, we propose the usage of circuit training method in the system of physical culture lessons for primary school children in general schools, as one of the most interesting one [9; 13; 14].

A characteristic feature of the circuit training method is the alternative dosage of 6–12 exercises (stations) complex, the training effect of which is aimed at the development of specific motor quality or several ones, as well as the development of certain functional systems of the body. The training task consists of 2–4 repetitions of a particular complex for a precisely defined time. At the same time, depending on the task 2–4 times, one and the same exercise is performed, and then in the same mode 2-th, 3-th, etc., or at each station is done in one approach, and in this version all stations are repeated several times. And most importantly, it is interesting for children to perform exercises, which promotes motivation for occupations and, as a consequence, increases the level of physical fitness.

Ways of circuit training are simple techniques and well-mastered physical exercises. The content of the training task can be expressed in the form of a scheme using symbols, which positively affect the motivation to engage in physical education [1, 10]. In connection with data listed above, the selected topic is relevant and timely.

Material and Methods. *The Purpose of the Study* – to elaborate and scientifically substantiate the training methods for physical education classes optimization for primary school children.

Participants – the experiment was conducted at the Mykhaylivskiy educational institution of I–II stages from September 2016 to May 2017. There were 107 pupils of 9–10 years old who were divided into experimental and control groups (experimental groups: 27 – boys, 26 girls, control groups: 28 – boys, 26 girls). The experiment was attended by boys and girls 9-10 years old who for health reasons, were included in the main medical group.

Organization of Research. While developing our methodology, the next main requirements were taken into account:

a) consistency with the main standards: correspondence of purpose, objectives and content; compliance with the general didactic principles: consciousness and activity, visibility, accessibility and individualization, systematicity and consistency; strength and scientific knowledge; systematic and consistent; the principle of the assimilation of knowledge, skills and abilities; the principle of emotion; conformity of the chosen teaching of methods to the structural components of the training content (understanding of the basic concepts, patterns of the subject etc., the significance of the learned in the development of personality);

b) suitability for all children: taking into account age-specific characteristics; taking into account sexual characteristics; also taking into consideration regional (local) features; the ability of pupils to be taken into account;

c) continuity and progress: the continuity of the method content; succession of achievements of pupils;

d) ease of use: degree of detail; availability of approach understanding to the construction of the method; the availability of the terms used; is available for nonprofessional spelling language.

In the state program, educational material is distributed not by sports, but by modes of motor activity, which enables students to master the basics of motor activities that can be further developed in any form of sport chosen by the child. In developing our methods, we relied on the state standard, so that there were no problems in comparing the results of the control and experimental groups.

Exercises for developing physical qualities are systematized on the basis of functional action for the development of certain physical abilities. This allowed us to select the necessary exercises, to develop on their basis a variety of complex training courses (16 complexes), the usage of which allowed to plan the load and ensure continuity in the development of basic physical qualities.

Taking into consideration the psychological peculiarities of primary school children, in our method we were planning complex lessons that made it possible to include various physical exercises in a lesson that would increase the interest and emotional state of the children.

In accordance with the tasks of the control and experimental groups to increase the student's motivation to self-improvement, it is recommended to use the following components (table 1).

Table 1

Distribution of the Percentage of Forming Components

№ p/p	Forming Components	% in Defining Academic Achievements		Evaluation Method
		CG	EG	
1	Attitude to lessons, attendance, participation, preparation for the lesson	10 %	10 %	Teacher supervision
2	Experience and skills, determined methodical ability to apply them in game situations	15 %	20 %	Teacher supervision, self-grading
3	Development of physical qualities (strength, endurance, speed, flexibility, coordination)	20 %	25 %	Monitoring
4	Pupil's personal progress in indicators, level of physical fitness	15 %	20 %	Monitoring
5	Knowledge and their application in practice (basic concepts, rules of the game, understanding of the processes occurring in the body during exercises, etc.)	15 %	15 %	Teacher supervision, self-grading
6	Behavior: social behavior, participation in competitions, adherence to safe conduct rules and health at school lessons	25 %	10 %	Teacher supervision, mutual evaluation
	Total:	100 %	100 %	

Both in the control and the experimental groups, classes took place three hours per week. Considering the level of physical fitness of pupils, their interests and abilities, the state of the material and sports facilities of the educational institution, the climatic conditions, the teacher independently allocates a certain number of hours to study the components of each type of motor activity.

In the lessons of physical education in the experimental group there were interdisciplinary connections with history, music, choreography, health basics and other subjects.

When planning classes using the method of circuit training in the physical education lesson, a large number of varied, high-quality and vibrant inventory and equipment is a very important factor. This is due to the increased perception of bright subjects of primary school children, which increases interest in the lesson.

When choosing exercises for complex training, it is necessary to take into account the content of the lesson and the place of its conduct. It's important to pay attention to the fact that physical education classes during the school year take place both outdoor and indoor. Changing the environment positively affects the emotional state of the child in the learning process.

In the education of adroitness, we improved the ability of 9–10 year old children to navigate the space and accuracy of movements in time and power characteristics. Exercises were used: jumps from different starting positions to a specific label; juggling balls, throwing at target; climbing gymnastic wall and sloping bench.

By raising speed, we paid attention to all components: time of motor reaction, speed of single movement and frequency of movement. Exercises were used: rapid response to a signal, pre-determined way (start, jump, and splash), running and jumping at place, running and jumping on skipping-rope, basketball/volleyball handball elements, simple movements in different joints.

By improving children's strengths, we focused on raising the level of «explosive» force, and then on the dynamic force. Ways of upbringing the first one – throwing of small weights, starting run, various jumps; the second one – exercises with partner's resistance, stretching or compression of shock absorbers.

Exercise for flexibility we performed in each complex as a calming point, thus controlling heart rate during exercise. But we did not achieve the maximum flexibility during the exercises, so that there was no trauma of the musculoskeletal system.

We improved our endurance by increasing the number of exercises.

We paid a lot of attention to the final part. This is due to the fact that this age is characterized by increased excitability, so the activity in the final part should end with a sedentary game, which reduces the excitability of the organism; gradually bring it to the norm. Children were offered a game that caused only positive emotions (joy and pleasure), regardless of the outcome of the game (such as loser), easy jogging, «soothing» walking, exercises and games of attention, dance exercises with music (slow pace of music), exercises on relaxation (with objects and without objects). Important is the use of promotion (approval, praise), which is a stimulus aimed at self-development and self-improvement. Due to our method, the body is faster recovered and the child is ready for the next lesson in the schedule.

At the beginning and at the end of the study, all pupils met the control standards which allowed determining the level of development of physical qualities and level of physical preparedness:

1. Sit and reach (cm) – flexural testing.
2. Do sit-ups for 1 minute (number of times) – testing abdominal muscle strength abilities.
3. Floor dips (number of times) – testing strength abilities of the muscles of the hands.
4. Standing long jumps (cm) – develops such qualities as strength, speed, learn to navigate in space, concentrate efforts (testing of speed-strength abilities).
5. Shuttle run 4x9 (sec) – development of coordination, finishing jerk (testing of coordination abilities).
6. Running 30 m (sec) – Testing of speed abilities.
7. Throw of a stuffed ball weighing 2 kg (m) – testing strength abilities [15, 18].

At the beginning and at the end of the study, all children performed norms that allowed determining their level of physical fitness development.

Statistical analysis of data was carried out using the SPSS Statistics program.

Results. Table 2 shows the results of testing the level of development of physical abilities of pupils before and after the experiment.

Table 2

Statistical Indicators of Motor Abilities Development of Pupils of Both Sexes Before and After the Experiment

Tests	Statistical Characteristics	Control Group				Experimental Group			
		Boys		Girls		Boys		Girls	
		n – 28		n – 26		n – 27		n – 26	
		Experiment							
1	2	3	4	5	6	7	8	9	10
Sit and reach, cm	\bar{x}	6,1	8,76	8,00	12,08	6,2	11,47	8,10	14,77
	σ	0,93	1,74	0,62	0,41	6,74	1,38	0,68	0,50
	V	7,27	5,51	8,63	8,04	7,31	5,16	8,66	7,18
	m	0,15	0,85	0,54	0,67	0,21	0,67	0,57	0,72

The End of the Table 2

1	2	3	4	5	6	7	8	9	10
Do sit-ups for 1 minute, number of times	\bar{x}	23	27	22	28	22	31	21	30
	σ	0,79	0,64	0,72	0,89	0,69	0,61	0,79	0,91
	V	7,22	5,43	6,06	7,28	7,03	5,05	6,11	5,62
	m	0,73	0,59	0,73	0,61	0,67	0,70	0,67	0,74
Floor dips, number of times	\bar{x}	17	18	7	10	17	21	7	11
	σ	1,65	1,22	0,72	0,71	1,87	1,56	0,66	0,51
	V	7,71	6,47	6,53	6,95	7,39	6,89	6,79	6,05
	m	0,10	1,29	0,10	0,29	0,13	1,31	0,11	0,42
Standing long jumps, cm	\bar{x}	141	148	121	129	141	155	120	136
	σ	5,01	4,91	2,61	3,48	5,01	4,12	2,08	3,66
	V	9,03	7,84	8,18	7,85	9,06	7,76	8,26	7,52
	m	2,26	3,09	2,15	3,28	2,27	3,02	2,18	3,81
Shuttle run 4x9 m, sec	\bar{x}	12,04	11,24	13,34	12,94	12,03	11,14	13,30	12,17
	σ	0,71	0,64	0,71	0,33	0,72	0,65	0,81	0,60
	V	5,21	5,22	6,22	7,18	5,61	5,16	6,76	6,08
	m	0,12	0,19	0,11	0,14	0,12	0,21	0,12	0,19
Running 30m, sec	\bar{x}	5,96	5,63	6,65	6,90	5,97	5,13	6,63	5,90
	σ	0,39	0,36	0,35	0,33	0,40	0,34	0,45	0,39
	V	6,91	7,11	8,91	8,72	6,34	6,25	8,34	8,12
	m	0,14	0,19	0,14	0,21	0,15	0,18	0,17	0,16
Throw of a stuffed ball weighing 2 kg, m	\bar{x}	4,30	5,10	4,30	5,00	4,50	7,20	4,50	6,90
	σ	0,62	0,49	0,53	0,31	0,69	0,37	0,58	0,43
	V	6,16	4,67	6,78	5,15	6,72	4,49	6,91	4,11
	m	0,51	0,41	0,43	0,24	0,59	0,49	0,49	0,39

Listed in table 2 data before and after the experiment indicates that all the groups are more homogeneous in terms of the tests for the experiment (V to 9,06 % of the boys, V to 8,91 % of the girls) and after the experiment (V to 7,84 % of the boys; V to 8,04 % – girls).

The rationally organized process of using the method of circuit training for pupils of experimental groups is aimed at the versatile and simultaneously proportional development of motor abilities as evidenced by the obtained data.

So, analysing the benchmarks of the flexibility test – «Sit and reach» received the following increment rates after the experiment. Boys: control group 8,76±0,85 cm; the experimental group was 11,47±0,67 cm ($p < 0,01$). Girls: control group: 12,08±0,67 cm; the experimental group was 14,77±0,72 cm ($p < 0,01$).

Testing of abdominal muscle strength abilities – «Do sit-ups for 1 minute» after the introduction of the experiment showed the following indicators. Boys: control group 27±0,59 times; the experimental group was 31±0,70 times ($p < 0,05$). Girls: control group 28±0,61 times; the experimental group was 30±0,74 times ($p < 0,05$).

The «Floor dips» with the boys after the study were as follows: control group: 18±1,29 times; Experimental group: 21±1,31 times ($p < 0,05$). In girls: control group: 10±0,29 times; Experimental group: 11±0,42 times ($p < 0,05$).

Indicators of the «Standing long jumps» from boys and girls experimental groups at the end of the experiment were within the average and above average. And in boys and girls, control groups are only on average level. Boys: control group: 148±3,09 cm; Experimental group: 155±3,02 cm ($p < 0,01$). Girls: control group: 129±3,28 cm; Experimental group: 136±3,81 cm ($p < 0,05$).

The coordination of the boys after the experiment in the test «Shuttle run 4x9 m» was as follows: control group 11,24±0,19 s; the experimental group 11,14±0,21 s ($p < 0,05$). In girls: control group 12,94±0,14 s; the experimental group 12,17±0,19 s ($p < 0,05$).

The development of speed capabilities received with the test «Running 30 m». Indicators grew both in the control and in the experimental groups of both sexes. Boys: control group: 5,63 ± 0,19 s; Experimental group: 5,13±0,18 s ($p < 0,05$). Girls: control group 6,10±0,15 s; Experimental group 5,90±0,16 s ($p < 0,05$).

Also, after the introduction of the experimental method, the test results «Throw of a stuffed ball weighing 2 kg» improved only in experimental groups. This is due to the fact that many exercises with partner countermeasures and exercises, with various equipment weighing from 0,5kg to 2kg, were included into the exercise complexes. Boys are: control group: $5,10 \pm 0,41$ m. Experimental group: $7,20 \pm 0,49$ m ($p < 0,05$). Girls: control group $5,00 \pm 0,24$ m. Experimental group $6,90 \pm 0,39$ m.

It should be noted that for the effective development of physical qualities in the control and experimental groups the decisive factor was taking into account sensitive periods and a comprehensive approach to physical education classes.

Discussion. Human life is a continuous process of development. The child's body is constantly in the process of growth and development, which take place continuously in a certain regular sequence. That's why, physical culture is considered an important part of development – from birth to adulthood [4, 17]. Physical culture is considered as the most important, sometimes decisive factor in strengthening the health of the younger generation and overcoming adverse environmental conditions [7; 8; 11].

It is noted that in comparison with the middle and older age, provided the correct organization of movements, physical activity is most effective for primary school children, and the most significant changes in the development of physical properties occur at 6–12 years [2; 4]. In this way, provided that the age characteristics of children's development are taken into account, it is possible successfully and purposefully to develop basic physical abilities in children of primary school age [1; 5; 11; 16].

While constructing the method, we noted to this feature for primary school children and it contributed to the positive results of the study. The data obtained (table 2) in the study, showed that the level of physical fitness in the beginning was the same in all groups regardless of gender. During the experiment, positive dynamics was observed in all groups, but the experimental groups gave a more positive increase in performance due to the developed methodology. In the experimental groups (boys, girls) – the indicators improved by 39,52 %, in the control groups (boys, girls) the indicators improved by 20,11 %. The data obtained during the implementation of the developed methodology indicate that we not only confirmed the research of scientists [2; 6; 11; 17], but also supplemented them. Analysis of changes in physical fitness also allows us to note the positive effect of «circuit training» on improving flexibility, muscle strength of the hands and core, speed-strength abilities.

Qualitative increase in the level of physical fitness showed that the use of the developed methodology for almost all indicators ensured the achievement of the highest indicators in the tests of physical fitness.

Conclusions. According to the results of the analysis of the literature it was established that in the presence of a significant number of studies aimed for finding ways of increasing the physical education effectiveness for 9–10 year old children using the method of circuit training, the main problem is the search for innovative approaches to the organization of occupations also considering interests and age characteristics of children.

It is proved that the leading role in optimization of physical education lessons for 9–10 year old children with the usage of the method of circuit training belongs to scientifically substantiated and adequate relations of external and internal factors of the child's development.

Qualitative characteristic of the level of physical fitness showed that the use of experimental techniques in almost all indicators ensured the achievement of the highest values of standards.

The largest absolute increase in physical fitness indicators in experimental groups was found in the development of such motor qualities as flexibility, muscle strength of the hands and trunk, and speed-power. The growth rates of the indicators of the physical fitness of the experimental group pupils were significantly higher than that of the control group, namely: the muscle strength of the hands was 4,93 and 2,99 times (respectively, for boys and girls); speed-strength physical qualities – 4,81 and 4,75 times; muscle strength of the body – at 4,64 and 4,24 times; coordination at 4,00 and 3,88 times; flexibility – in 3,19 and 3,73 times; speeds – at 2,08 and 2,13 times, respectively, for boys and girls in the experimental group.

Thus, the obtained results proved the effectiveness of our method of using the method of circuit training as an upgraded way for the development of physical abilities of 9–10 year old primary school children.

Conflicts of Interest. The authors declare that there is no conflict of interest.

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