



## Development of coordination and speed-power abilities in children 8-9 years with the help of exercise Classics

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### Abstract

The aim of the study is to study the impact of the exercise «Classic's» on the performance of coordination and speed-power abilities of younger schoolchildren. Methods – pedagogical experiment lasted for 9 months, it was attended by 50 children who study in a regular school in the second grade. Physical education lessons were held twice a week, for 40 minutes. Speed-power abilities were determined by the test «long Jump». Coordination abilities were determined by the «Shuttle run» test. Programs Excel-2016 and Biostatistica-2009, t-test ( $p < 0.05$ ) were used. Results – after a pedagogical study, the indicators of schoolchildren in CG improved, but not significantly. Children from EG, who performed the exercise «Classic's» at each lesson in physical education in school, were able to significantly improve their performance in both tests. In the «Shuttle run» test, the results were 19.1% higher ( $p < 0.05$ ), while the «long Jump» test improved from  $113.3 \pm 6.1$  cm to  $141.4 \pm 7.4$  cm ( $p < 0.05$ ). The results of schoolchildren from EG, show the effectiveness of the use of exercises «Classic's» in physical education lessons at school, as an addition to the standard program. Conclusion – if the lessons of physical culture in school with children 8-9 years to perform the exercise «Classic's», the performance of speed-power and coordination abilities will improve significantly.

**Keywords:** physical culture, lesson, coordination abilities, speed-power abilities, schoolchildren

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## INTRODUCTION

Today the problem of insufficient motor activity of schoolchildren is urgent. Sedentary position at the Desk or Desk affects the functioning of many systems of the body of the schoolchildren, reduced efficiency of the whole body. Every year the number of children who cannot fully engage in sports or perform physical exercises of different complexity increases. The problem of motor activity of younger schoolchildren is actively engaged in some specialists [1-3]. Including their physical development [4-5]. The lesson on physical culture at school is obligatory for visiting by pupils. The main purpose of the lesson – a comprehensive harmonious development of schoolchildren. Discipline and development of physical abilities [6-7]. Since primary school age, special attention should be paid to the development of coordination and speed-power abilities. Purposeful development of specific abilities in sensitive periods gives the greatest effect and the rate of their growth [8-9]. The high level of development of coordination abilities allows schoolchildren to quickly master complex technical actions, solve motor problems in a short time [10-12]. Speed-power ability of schoolchildren – is the ability to develop maximum muscle tension in a minimum period of time [13-14].

Modern school curriculum on physical culture for pupils of Junior, middle and senior management involves a wide range of tools, techniques, principles, necessary and sufficient for the teaching of physical culture at school [15]. In many schools in the country to implement the program is not easy, there are several difficulties. For example, the lack of a comfortable gym at school. Lack of space for a lesson in physical culture reduces the motor activity of schoolchildren and motor density of the lesson as a whole. The solution to the problem is seen in the development of new physical exercise, which will develop the basic physical abilities of younger schoolchildren. At the same time, the exercise should not be difficult to perform and do not require additional equipment or space to perform it. At the same time, its implementation should not distract schoolchildren from solving a new problem of each lesson in physical education at school.

The hypothesis of the study: if at each lesson on physical culture in school with children of primary school age to perform the exercise «Classic's», the indicators of coordination and speed-power abilities of children will significantly improve, and thus increase the motor activity of schoolchildren will increase the motor density of the lesson.

The purpose of the study: to study the effect of the exercise of «Classic's» on the performance of coordination and speed-power abilities of younger school schoolchildren.

## MATERIALS AND METHODS

### Participants

Pedagogical experiment lasted for the school year in a regular school №60, Moscow, Russia. The study involved boys and girls from 2-A class and 2-B class. In each class there were 25 people (50 in total). All schoolchildren for the period of the study were healthy and admitted by a doctor to practical lessons in physical education at school. Physical education classes were held twice a week for 40 minutes each lesson.

Table 1. Exercise «Classic's»

1	5	6		5	1	8		3	7	1
8	2	3		2	6	4		8	2	5
9	7	4		9	3	7		4	9	6
Square 1				Square 2				Square 3		

### Procedure

Disciples 2-a class formed the Control group (CG), and grade 2-B class – the Experimental group (EG). Children in CG were engaged according to the standard program, and children from EG in addition carried out exercise «Classic's» (table 1).

### Exercise «Classic's»:

On the floor of the sports hall there are three squares. The side of each square is 180 cm. Inside each square there are nine small identical squares. Inside each small square there are numbers (1-9). Each schoolchild must jump from square to square from the first number to the second, and so on, then in reverse order to number one. You can jump in any way during the physical education lesson. In case of an error, you need to return to the previous square. You need to overcome all the squares in the lesson, before each lesson the teacher changes the numbers in the squares.

Before the beginning and after the end of the study all the schoolchildren had completed two controlled test:

- 1) Shuttle run 3x10m (assessment of general coordination abilities) [16];
- 2) Long jump from the place, push with two legs (assessment of speed-power abilities). The result is the best of two attempts [17].

### Statistical analysis:

The statistical and mathematical analysis of the results used Excel 2016 and Bio-stat 2009, t-test criterion,  $p < 0.05$  [18-19].

## RESULTS

Before the study and after the end of the study, all schoolchildren passed tests, at the beginning of the study, the difference in the indicators of CG and EG was unreliable (table 2). From the results presented in table 2 it can be seen that after the end of the pedagogical experiment, the indicators in both groups for the two tests improved. In CG, in which schoolchildren from grade 2 were engaged in the standard program, indicators in the test «Shuttle run» improved by 3.9% ( $P < 0.05$ ), and indicators in the test «long Jump» improved from  $107.3 \pm 4.4$  cm to  $119.4 \pm 7.0$  cm ( $P < 0.05$ ). The results of schoolchildren, shown from the beginning to the end of the study, indicate the effectiveness of the use of the standard program in physical education lessons, it should also be noted the natural increase in the indicators of speed-power and coordination abilities in primary school age.

In EG indicators improved significantly in both tests. In the «Shuttle run» test, the results were 19.1% higher ( $p < 0.05$ ), while the «long Jump» test improved from  $113.3 \pm 6.1$  cm to  $141.4 \pm 7.4$  cm ( $p < 0.05$ ). The results of schoolchildren from EG, show the effectiveness of the use of exercise «Classic's» in physical education lessons at school, as an addition to the standard program.

Table 2. Indicators of speed endurance and coordination abilities of schoolchildren 8-9 years

Test	CG				EG			
	Before	After	%	significance	Before	After	%	significance
Jumping through rope (number of jumps)	$107.3 \pm 4.4$	$119.4 \pm 7.0$	11.3	$p < 0.05$	$113.3 \pm 6.1$	$141.4 \pm 7.4$	24.8	$p < 0.05$
Long jump (cm)	$10.1 \pm 0.9$	$9.7 \pm 0.5$	3.9	$p < 0.05$	$10.5 \pm 0.8$	$8.5 \pm 0.5$	19.1	$p < 0.05$

CG - Control group, EG - Experimental group

## DISCUSSION

In modern literature increasingly raises the question of motor activity of schoolchildren [6,7,20]. In practice, teachers and educators see more and more children who have medical contraindications not only to sports activities, but also to physical education. Some experts propose to change the standard program of physical education for schoolchildren or replace it with a completely new method [21-23]. In our opinion, this is not the right decision, as the standard program of physical culture in the school includes not only the development of physical abilities, but also the education of discipline,

moral and volitional qualities and many other psychological aspects. In addition, one of the important tasks of the standard program is to teach schoolchildren new physical exercises. The solution to the problem of physical activity of schoolchildren is possible only by supplementing the standard program of physical culture with new elements. The effectiveness of the modern program is proved by the results of the study, as children who were engaged in the standard program were able to improve performance in both control tests.

The results of the pedagogical experiment confirm the fact that the sensitive period for the development of coordination and speed-power abilities is the primary school age. All children, without exception, were able to improve the results in both control tests [8,9,24].

Exercise «Classic's», which was performed by schoolchildren in the experimental group, proved to be effective. The children significantly improved their coordination and speed-power abilities in both control tests. The uniqueness of the exercise «Classic's» – is easy to perform, does not require additional space, specialized training or the presence of complex equipment. Exercise «Classic's» can fill any pause in the lesson and perform in any part of the lesson, without being distracted from the main tasks of the lesson.

The school group, in which children performed the exercise «Classic's», engaged in physical culture with greater interest than children who were engaged in the standard program. The children of the EG jumped enthusiastically from square to square ahead of each other. This confirms the effectiveness of the competitive method in working with children of primary school age [25]. And proves the effectiveness of the exercise «Classic's» in the classroom at school.

It should be noted the importance of using a differentiated approach in working with children of school age [26-28]. In this study, the essence of the approach is an independent and individual selection of the load when performing the exercise «Classic's». Children, based on their own state of health, well-being and mood, began to perform the exercise «Classic's» in any part of the class. They chose the duration and height of the jumps, the speed of movement and the time of the exercise.

## CONCLUSION

In order to increase the motor activity of schoolchildren, it is important to use the exercise «Classic's» in physical education lessons at school. When using the exercise «Classic's» in physical education lessons significantly increased performance coordination and speed-power abilities of schoolchildren 8-9 years. This exercise increases the emotional background of the lesson and its motor density. The results of the study are relevant and useful for teachers of physical education in school.

## REFERENCES

1. Galan Y, Koshura A, Moseychuk Y, Paliichuk Y, Moroz O, Tsybanyuk O, Yarmak O. Characteristics of physical conditions of 7-9-year-old schoolchildren within the process of physical education. *Journal of Physical Education and Sport* 2018; 18(5): 1999-2007
2. Bodnarchuk O, Rymar O, Solovey A, Malanchuk H. The interaction of school and family in physical education of first grade students. *Journal of Physical Education and Sport* 2018; 18(2): 1092-1098
3. Pavlova I, Bodnar I, Mosler D, Ortenburger D, Wasik J. The influence of karate training on preparing preschool girls for school education. *Ido Movement for Culture* 2019; 19(2): 12-20. doi: 10.14589/ido.19.2.3
4. Chovanova E. Differences in motor coordination levels between the Slovak and Portuguese school-aged populations. *Physical Activity Review* 2018; 6: 251-256 Doi: 10.16926/par.2018.06.29
5. Ivashchenko O, Khudolii O, Iermakov S, Chernenko S, Honcharenko O. Full factorial experiment and discriminant analysis in determining peculiarities of motor skills development in boys aged 9. *Journal of Physical Education and Sport* 2018; 18(4): 1958-1965
6. Castelli D, Hillman C, Erwin H. Physical fitness and academic achievement in third- and fifth-grade students. *Journal of Sport & Exercise Psychology* 2007; 29(2): 239-352. doi: 10.1123/jsep.29.2.239
7. Donnelly J, Hillman C, Castelli D, Etnier J, Lee S, Tomporowski P, Lambourne K, Szabo-Reed A. Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review. *Medicine and science in sports and exercise* 2016; 48(6): 1197-1222. doi: 10.1249/MSS.0000000000000901

8. Larisa S. Extremely Early High Abilities, Sensitive Periods, and the Development of Giftedness: a conceptual proposition. *High Ability Studies* 2006; 8(2): 247-258. doi: 10.1080/1359813970080209
9. Charles HZ, Megan RG, Robert BM, Jana MK, Nathan AF. Sensitive Periods. *Monographs of the society for research in child development* 2011; 76(4): 147-162. doi: 10.1111/j.1540-5834.2011.00631.x
10. Lyakh VI, Sadowski J, Witkowski Z. Development of coordination motor abilities (CMA) in the system of long-term preparation of athletes. *Polish Journal of Sport and Tourism* 2011; 3: 187-97. doi: 10.2478/10197-011-0014-6
11. Shawkat R. The impact of development of the special coordination abilities on the general skill ability for table tennis juniors under 12 years old. *International journal of science culture and sport* 2014; 2(2): 30-42. Doi: 10.14486/ijscs71
12. Jaakkola J, Watt A, Kalaja S. Differences in the Motor Coordination Abilities Among Adolescent Gymnasts, Swimmers, and Ice Hockey Players. *Human Movement* 2017; 18(1): 44-49. doi: 10.1515/humo-2017-0006
13. Loturco I, Pereira LA, Moraes JE, Kitamura K, Cal Abad CC, Kobal R. Jump-Squat and Half-Squat Exercises: Selective Influences on Speed-Power Performance of Elite Rugby Sevens Players. *PLoS ONE* 2017; 12(1). doi: 10.1371/journal.pone.0170627
14. Behm DG, Young JD, Whitten JHD, Reid JC, Quigley PJ, Low J, Li Y, Lima CD, Hodgson DD, Chaouachi A, Prieske O, Granacher U. Effectiveness of Traditional Strength vs. Power Training on Muscle Strength, Power and Speed with Youth: A Systematic Review and Meta-Analysis. *Frontiers in physiology* 2017; 8: 423. doi: 10.3389/fphys.2017.00423
15. Lyakh VI, Zdanevich AA. *Work program on physical culture, grade 1-4*. Moscow: Education, 2010; 80.
16. Polevoy GG. Training of motor rhythm in students, practicing football. *Physical education of students* 2017; 21(4): 189-192. Doi: 10.15561/20755279.2017.0407
17. Polevoy GG. The development of speed-power qualities of schoolchildren with different typologies applying coordination training. *Pedagogics, psychology, medical-biological problems of physical training and sports* 2019; 23(1): 43-46. doi: 10.15561/18189172.2019.0107
18. Oldham J. Statistical tests (Part 2): parametric tests. *Nursing standard* 1993; 44: 28-30. doi: 10.7748/ns.7.44.28.s54
19. Khusainova RM, Shilova ZV, Curteva OV. Selection of appropriate statistical methods for research results processing. *Mathematics Education* 2016; 11(1): 303-315. doi: 10.12973/iser.2016.21030a
20. Francois T, Roy JSh. School physical activity, school sports and academic performance. *The international journal of behavioral nutrition and physical activity* 2008; 5(10). doi: 10.1186/1479-5868-5-10
21. Gregor S, Janko S. Influence of the quality implementation of a physical education curriculum on the physical development and physical fitness of children. *Journal BMC Public Health* 2012; 12(61). doi: 10.1186/1471-2458-12-61
22. Maureen D, Heather H, Kara D, Rebecca LL. School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18. *Journal Cochrane Systematic Review* 2013; 1-10. doi: 10.1002/14651858.CD007651.pub2
23. Dallolio L, Ceciliani A, Sanna T, Garulli A. Proposal for an Enhanced Physical Education Program in the Primary School: Evaluation of Feasibility and Effectiveness in Improving Physical Skills and Fitness. *Journal of physical activity & health* 2016; 13(10). doi: 10.1123/jpah.2015-0694
24. Starosta W, Hirtz P. Sensitive and critical periods of motor coordination development and its relation to motor learning. *Journal of Human Kinetics* 2002; 7: 19-28.
25. Wood C, Hall K. Physical education or playtime: Which is more effective at promoting physical activity in primary school children? *BMC Research Notes* 2015; 8(1): 12. doi: 10.1186/s13104-015-0979-1
26. Whipp P, Taggart A, Jackson, B. Differentiation in outcome-focused physical education: pedagogical rhetoric and reality. *Journal Physical Education and Sport Pedagogy* 2014; 19(4): 370-382. doi: 10.1080/17408989.2012.754001
27. Elghoul Y, Bahri F, ChaariN, Ezeddinie S, Masmoudi L, Souissi N, Frikha M. Effect of difficulty manipulation strategies on acquisition, retention and associated perceptions in fine motor coordination task learning in young school boys. *Physical Activity Review* 2018; 6: 100-109. doi: 10.16926/par.2018.06.14
28. Milic M, Grgantov Z, Chamari K, Ardigo LP, Bianco A, Padulo J. Anthropometric and physical characteristics allow differentiation of young female volleyball players according to playing position and level of expertise. *Biology of Sport* 2017; 34(1): 19-26. doi: 10.5114/biolSport.2017.63382