

Development of Attention Stability in Children Aged 9-10 Years with the Help of Exercises Classics

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Abstract

The purpose of the study is to reveal the influence of the "Classics" exercise on the attention span of 9-10-year-old children. The pedagogical experiment lasted 9 months in which 40 schoolchildren participated. The duration of one lesson was 40 minutes, two lessons a week, in total, 56 physical education classes were held during the year. Children in the control group (CG) – 3A class (20 people), were engaged in the ordinary physical education program. Shuttle run determined the level of coordination of children, and the stability of attention was determined by the Bourdon test. In the control group, coordination indicators improved by 2.9% ($P > 0.05$), and attention span from 3.5 ± 0.3 to 3.8 ± 0.3 ($P > 0.05$). In the experimental group, the indicators became higher than at the beginning in the Bourdon test by 32.4% ($P < 0.05$), and in the shuttle run they improved from 9.9 ± 0.5 to 8.5 ± 0.4 ($P < 0.05$). Thus, if children perform the classics exercise at physical education lessons at school, not only motor abilities but also attention stability will improve significantly.

Keywords: Schoolchildren, Physical culture, Classics, Attention stability, Coordination abilities

INTRODUCTION

The full health of children, the harmony of physical development and mental processes from early childhood, is a problem of our time. Diseases, obesity, heart, and vascular problems are getting younger now, even schoolchildren at school are experiencing them. Maintaining a healthy lifestyle, and most importantly, maintaining physical fitness at an optimal level – this is a way out of the current situation in the world. Since school years, it is necessary to purposefully and under control increase the mode of motor activity. Physical culture at school takes the leading position. A lesson at school is not just recommended, but mandatory in physical education, where children receive basic knowledge of physical exercises. They also increase their level of physical development. Each lesson is important, carries educational and educational tasks [1-3].

All lessons are fixed in the usual program at the school for children in grades 1-11 [4]. Despite some flexibility in the work of the program for schoolchildren, it does not sufficiently consider individual and differentiated approaches for younger schoolchildren. This approach allows you to unlock the potential of the schoolchildren, his physical and intellectual abilities, and internal reserves of the body [5, 6]. Therefore, there are several methods that the authors suggest to replace the existing standard program [7-9]. In our opinion, the existing program needs to be supplemented only slightly to increase the emotionality and movement of each physical education class. Exercise Classics effectively fits into the modern physical education program at school [10].

Coordination abilities are a set of motor abilities that determine the speed of learning new movements, as well as the ability of a person to reconstruct motor activity in unexpected situations. Such abilities are important not only for everyday life but also for the physical and sports life of a person. A high level of development of coordination abilities allows you to cope with almost any new situation without any problems [11, 12]. It is more effective to develop coordination abilities at the age of 7-11 years [13, 14].

A sufficient number of studies have been conducted on the study of physical abilities and their impact on mental processes. Of course, it is proved that physical culture, sports, and physical exercises have a beneficial effect on the formation of mental and cognitive processes [15-17]. There are also higher scores in children who are actively engaged in physical education and sports [18, 19].

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In this study, it is necessary to identify the significance of exercises Classics for the formation of attention stability of schoolchildren.

MATERIALS AND METHODS

Study Design and Population

Control study: The study involved primary school children in the number of 40 people. They were allowed to take physical education classes for health reasons. Schoolchildren of 9-10 years old, studied in the third grade of school №60 (city - Kirov, Russia).

Procedure

From September to May, during the school year, the pedagogical experiment lasted. The duration of one lesson was 40 minutes, two lessons a week, in total, 56 physical education classes were held during the year.

Children in the control group (CG) – 3A class (20 people), were engaged in the ordinary physical education program [4].

Schoolchildren from the experimental group (EG) studied in grade 3b and studied according to the usual program and performed the exercise "Classics" (Table 1).

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

Measuring Tools

In the gym, 9 squares of 60 centimeters are drawn, they have numbers (1-9). During the lesson, the children must jump from square number 1 to square number 2 and so on, then vice versa to number 1. If the students make a mistake, they start over. All numbers change in each lesson; students must overcome all 3 large squares (27 small ones) during the lesson. Before the study, the children passed the standards:

1. Shuttle run 3x10 m (coordination abilities) [20].
2. Methodic «Test Bourdon» (attention stability) (Fragment of the test is in Table 2) [21].

Table 2. Fragment of the Test Bourdon

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 6 | 7 | 9 | 8 | 6 | 5 | 2 | 4 | 3 | 5 | 6 | 1 | 9 | 5 | 6 | 4 | 2 | 8 | 3 | 7 | 6 | 4 | 9 | 4 | 6 | 5 | 3 | 8 | 2 | 3 |
| 5 | 6 | 7 | 9 | 8 | 6 | 5 | 2 | 4 | 3 | 5 | 6 | 1 | 4 | 6 | 5 | 9 | 8 | 3 | 7 | 6 | 4 | 5 | 8 | 2 | 5 | 3 | 7 | 6 | 9 | 4 | 6 |
| 6 | 8 | 5 | 4 | 2 | 1 | 3 | 5 | 6 | 8 | 9 | 7 | 5 | 4 | 6 | 8 | 3 | 3 | 7 | 6 | 4 | 9 | 8 | 6 | 7 | 5 | 2 | 4 | 3 | 5 | 6 | |
| 8 | 9 | 7 | 5 | 4 | 3 | 1 | 6 | 5 | 2 | 8 | 6 | 7 | 9 | 4 | 6 | 5 | 3 | 8 | 7 | 2 | 7 | 7 | 6 | 5 | 6 | 5 | 4 | 8 | 4 | 8 | |
| 9 | 7 | 9 | 8 | 3 | 7 | 6 | 4 | 9 | 4 | 6 | 7 | 6 | 3 | 2 | 1 | 5 | 3 | 4 | 5 | 6 | 4 | 9 | 7 | 9 | 8 | 7 | 9 | 8 | 5 | 6 | |
| 4 | 2 | 4 | 3 | 3 | 2 | 4 | 6 | 3 | 2 | 1 | 6 | 3 | 9 | 5 | 9 | 7 | 7 | 6 | 4 | 5 | 8 | 2 | 5 | 3 | 7 | 6 | 9 | 4 | 6 | 6 | |
| 7 | 9 | 8 | 6 | 5 | 2 | 4 | 3 | 5 | 6 | 1 | 4 | 6 | 5 | 9 | 8 | 3 | 7 | 6 | 4 | 5 | 8 | 2 | 5 | 3 | 7 | 6 | 9 | 4 | 6 | 8 | |
| 5 | 4 | 2 | 1 | 3 | 5 | 6 | 8 | 9 | 7 | 5 | 4 | 6 | 5 | 3 | 8 | 7 | 2 | 7 | 6 | 5 | 6 | 5 | 3 | 6 | 4 | 2 | 6 | 2 | 6 | 5 | |
| 6 | 5 | 4 | 8 | 4 | 8 | 9 | 7 | 9 | 8 | 7 | 6 | 3 | 2 | 1 | 5 | 3 | 4 | 5 | 6 | 4 | 9 | 7 | 9 | 8 | 7 | 9 | 8 | 5 | 6 | 4 | |
| 2 | 4 | 3 | 3 | 2 | 4 | 6 | 3 | 2 | 1 | 6 | 3 | 9 | 5 | 9 | 7 | 5 | 9 | 7 | 5 | 6 | 4 | 9 | 7 | 5 | 6 | 4 | 8 | 4 | 8 | 4 | |

In 150 seconds, the children must cross out the number that the teacher says, for example, the number "3".

$$\text{Formula results } S = (0.5N - 2.8n) / t; \tag{1}$$

N – numbers that the student looked at during the test; t – working time; n – sum of errors.

At the end build a graph with indicators S (up) every 0.25 points and t (to the right) every 30 seconds.

5 points – the line does not go beyond one zone (an excellent indicator of attention stability).

4 points – 2 zones, 3 points – 3 zones, 2 points – 4 zones, 1 point – 5 zones.

Data Analyses

In the course of processing the results, Microsoft excel 2016 programs were used (calculating the arithmetic mean), biostat 2009, in which the indicator of the parametric criterion t-student was determined, the result was considered significant at P<0.05 [22, 23].

RESULTS AND DISCUSSION

Before and after the study, all schoolchildren in class 3A and 3B took the «Shuttle run» test and Methodic «Test Bourdon». After the experiment ends, the results look different (Table 3).

Table 3. Coordination abilities and attention stability of children 9-10 years old n=20 in CG, n=20 in EG

| Test | Control group | | | |
|------------------------|--------------------|---------|------|--------|
| | Before | After | % | P |
| Shuttle run 3x10 m (s) | 10.2±0.6 | 9.9±0.5 | 2.9 | P>0.05 |
| Test Bourdon (points) | 3.5±0.3 | 3.8±0.3 | 8.6 | P>0.05 |
| | Experimental group | | | |
| Test | Before | After | % | P |
| Shuttle run 3x10 m (s) | 9.9±0.5 | 8.5±0.4 | 14.1 | P<0.05 |
| Test Bourdon (points) | 3.4±0.3 | 4.5±0.4 | 32.4 | P<0.05 |

According to the results of **Table 3**, it can be seen that the indicators of all schoolchildren became higher than they were. Children of their CG improved motor performance by 2.9% ($P > 0.05$), and stability of attention from 3.5 ± 0.3 to 3.8 ± 0.3 ($P > 0.05$). Thus, children in grade 3A who were involved in a regular physical education program were able to improve their physical and mental qualities, but not significantly.

Children from grade 3B also improved in both tests, but their results were significantly higher. In the test for coordination ability indicators, there were improvements from 9.9 ± 0.5 to 8.5 ± 0.4 ($P < 0.05$), and in the «Test Bourdon» test, the indicators improved by 32.4% ($P < 0.05$). Indicators of schoolchildren from class 3B indicate the absolute effectiveness of introducing exercise Classics in the process of younger schoolchildren in physical culture.

Special attention should be paid to the health and optimal state of physical abilities from early childhood. That is why there is a lesson in physical culture in secondary schools. It is mandatory to attend and very important from the point of view of improving children's health, and the results of all classes are summed up every year [1-3].

Of course, there is a standard physical education program at school, it is not ideal and requires minor adjustments. However, some authors believe that the standard program should be completely replaced with new methods and exercises [7-9]. We believe that this is wrong because the standard physical education program at school provides a significant amount of physical exercises that we can apply in everyday life. The usual program gives a complex of all exercises for different muscle groups.

The addition of the ordinary program can be attained through the employment of exercise Classics in each physical education lesson. Previously, it was proved that exercise Classics improves the indicators of physical and coordination abilities [10].

A new study confirms the effectiveness of the introduction of an individual approach to the educational process of schoolchildren. Using this approach in physical education classes, we more effectively develop each schoolchild physical development [5, 6, 24].

The results of the new study not only complement the existing physical education program at school, but also show an effective relationship between physical abilities and mental processes. It has been proven that those kids who perform the hopscotch exercise in each physical education class at school will significantly improve motor and mental abilities, such as attention stability. In some studies, the relationship between mental abilities and physical qualities has been proven [15-17], as well as the impact of physical education in school on schoolchildren's performance in school [18, 19]. The article

is promising, since the topic of public health in different countries is relevant [25-29].

CONCLUSION

Based on the results of the study, it can be concluded that the indicators of motor abilities of younger students will improve significantly if children perform the Classics exercises. In addition, the indicators of attention stability will become higher. The effectiveness of physical education classes at school will increase. Such studies are relevant and promising for further studies.

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ETHICS STATEMENT: All procedures met the ethical standards of the 1964 Declaration of Helsinki. Informed consent was obtained from all parents of the children included in the study.

REFERENCES

- Chen S, Kim Y, Gao Z. The contributing role of physical education in youth's daily physical activity and sedentary behavior. *BMC Public Health*. 2014;14(1):1-7. doi:10.1186/1471-2458-14-110
- Wallhead T, Garn A, Vidoni C. Sport Education and social goals in physical education: relationships with enjoyment, relatedness, and leisure-time physical activity. *Phys Educ Sport Pedagogy*. 2012;18(4):427-41. doi:10.1080/17408989.2012.690377
- Carpenter P, Morgan K. Motivational Climate, Personal Goal Perspectives, and Cognitive and Affective Responses in Physical Education Classes. *Eur J Phys Educ*. 1999;4(1):31-44. doi:10.1080/17408989900401003
- Lyakh VI. Physical culture. Grades 1-4: Textbook for general education institutions. – Moscow: Education; 2013. p. 190.
- Kühnhausen J, Dirk J, Schmiedek F. Individual classification of elementary school children's physical activity: A time-efficient, group-based approach to reference measurements. *Behav Res Methods*. 2016;49(2):685-97. doi:10.3758/s13428-016-0724-2
- Barker D, Quennerstedt M, Annerstedt C. Learning through group work in physical education: a symbolic interactionist approach. *Sport, Educ Soc*. 2015;20(5):604-23. doi:10.1080/13573322.2014.962493
- Dobbins M, Husson H, DeCorby K, LaRocca RL. School-based physical activity programs for promoting physical activity & fitness in children and adolescents aged 6 to 18. *Cochrane Database Syst Rev*. 2013;2. doi:10.1002/14651858.CD007651.pub2
- Chiodera P, Volta E, Gobbi G, Milioli MA, Mirandola P, Bonetti A, et al. Specifically designed physical exercise programs improve children's motor abilities. *Scand J Med Sci Sports*. 2008;18(2):179-87. doi:10.1111/j.1600-0838.2007.00682.x
- Dallolio L, Cecilian 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. *J Phys Act Health*. 2016;13(10):1024-34. doi:10.1123/jpah.2015-0694
- Polevoy G. Development of a sense of rhythm in children 8-9 years old with the help of exercise 'Classic's'. *Sri Lanka J Child Health*. 2020;49(2):140-4. doi:10.4038/sljch.v49i2.8961
- Bokin, A. Influence of coordination abilities of young karatekas on productivity of their sports activity. *Soc-Econ Phenom Proc*. 2013;12(58):198-201. doi:10.3200/JMBR.40.5.400-408
- Erecz M, Zagorac N, Katić R. The impact of football training on motor development in male children. *Coll Antropol*. 2008;32(1):241-7.
- Charles HZ, Megan RG, Robert BM, Jana MK, Nathan AF. Sensitive Periods. *Monogr Soc Res Child Dev*. 2011;76(4):147-62. doi:10.1111/j.1540-5834.2011.00631.x

14. Viru A, Loko J, Harro M, Volver A, Laaneots L, Viru M. Critical Periods in the Development of Performance Capacity During Childhood and Adolescence. *Eur J Phys Educ.* 2006;4(1):75-119. doi:10.1080/1740898990040106
15. Bidzan-Bluma I, Lipowska M. Physical Activity and Cognitive Functioning of Children. *Int J Environ Res Public Health.* 2018;15(4):800. doi:10.3390/ijerph15040800
16. Pietsch S, Böttcher C, Jansen P. Cognitive Motor Coordination Training Improves Mental Rotation Performance in Primary School-Aged Children. *Mind Brain Educ.* 2017;11(4):176-80. doi:10.1111/mbe.12154
17. Gerber M, Kalak N, Lemola S, Clough PJ, Pühse U, Elliot S, et al. Adolescents' exercise and physical activity are associated with mental toughness. *Ment Health Phys Act.* 2012;5(1):35-42. doi:10.1016/j.mhpa.2012.02.004
18. Fernandes VR, Ribeiro MLS, Melo T, Maciel-Pinheiro PdT, Guimarães TT, Araújo NB, et al. Motor coordination correlates with academic achievement and cognitive function in children. *Front Psychol.* 2016;7:318. doi:10.3389/fpsyg.2016.00318
19. Carral, JMC, Ayán C, Espiño MJS. The relationship between physical fitness and academic performance in spanish secondary education students: A longitudinal study. *Cultura, Ciencia y Deporte.* 2016;11:7-16. doi:10.12800/ccd.v11i1.638
20. Polevoy GG. Training of motor rhythm in students, practicing football. *Phys Educ Stud.* 2017;21(4):189-92. doi:10.15561/20755279.2017.0407
21. Book J, Shirn C. Almanac of psychological tests. Moscow: KSP; 1997. P. 320.
22. Khusainova RM, Shilova ZV, Curteva OV. Selection of appropriate statistical methods for research results processing. *Math Educ.* 2016;11(1):303-15. doi:10.12973/iser.2016.21030a
23. Tong X, Zhang ZY. Diagnostics of Robust Growth Curve Modeling Using Student's t Distribution. *Multivariate Behav Res.* 2012;47(4):493-518. doi:10.1080/00273171.2012.692614
24. Breuer C, Hallmann K, Wicker P. Determinants of sport participation in different sports. *Manag Leis.* 2011;16(4):269-86. doi:10.1080/13606719.2011.613625
25. Lanting Zh, Rong He, Yuanwei L, Fei Sh, Ying X, Ping Zh. Report of a patient with refractory atrial tachycardia whose heart rate was controlled using ivabradine. *J Int Med Res.* 2022;50(3):03000605221081727. doi:10.1177/03000605221081727
26. Ghaderpour S, Ghiasi R, Hamidian G, Heydari H, Keyhanmanesh R. Voluntary exercise improves spermatogenesis and testicular apoptosis in type 2 diabetic rats through alteration in oxidative stress and mir-34a/SIRT1/p53 pathway. *Iran J Basic Med Sci.* 2021;24(1):58-65. doi:10.22038/ijbms.2020.49498.11314
27. Gholamian S, Attarzadeh Hosseini S, Rashidlamir A, Aghaalijad H. The effects of interval aerobic training on mesenchymal biomarker gene expression, the rate of tumor volume, and cachexia in mice with breast cancer. *Iran J Basic Med Sci.* 2020;23(2):244-50. doi:10.22038/ijbms.2019.39535.9375
28. Koelen JA, Mansueto AC, Finnemann A, deKoning L, vander Heijde CM, Vonk P, et al. COVID-19 and mental health among at-risk university students: A prospective study into risk and protective factors. *Int J Methods Psychiatr Res.* 2022;31(1):e1901. doi:10.1002/mpr.1901
29. Passavanti G, Paoli A, Rizzato A, Ceccarelli I, Fiorenzani P, Casini I, et al. Age and training intensity differently affect male runners' endocrine and sexual parameters. *Chin J Physiol.* 2022;65(1):37-45.