

Influence of Exercise Classics on Children's Concentration

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KEYWORDS Classics. Concentration. Coordination Abilities. Physical Education. School Children

ABSTRACT The study aims to determine the influence of exercise Classics on the development of concentration abilities of children 9-10 years old. The study was conducted over a period of 9 months, in which 40 9-10-year-olds participated. The level of development of coordination abilities was assessed by the «Shuttle run» test, and the indicators of concentration of attention by the Methodic «Bourdon test». The programs Bio-stat 2009, Microsoft Excel 2016 and t-student were used for mathematical and statistical processing of results. After the end of the study, the indicators in both groups improved. These results indicate the effectiveness of using exercise Classics in physical education lessons in working with younger schoolchildren. If schoolchildren perform exercise Classics in physical education classes at school, they will improve the indicators of not only coordination abilities, but also the ability to concentrate attention.

INTRODUCTION

Problems of health and physical education are relevant, especially at school age (Jyoti et al. 2018; Thanyani et al. 2019). From early childhood, it is necessary to pay attention to optimal motor activity. Lack of movement leads to a large number of diseases, including heart disease, obesity and other diseases. At school, children have the opportunity to engage in physical education under the supervision of a teacher. Physical culture lesson is the main and mandatory form of physical education at school. In physical education classes, the schoolchildren receive a comprehensive harmonic development and develop basic physical qualities. In the process of learning at school, children improve their health and form motor skills (Wallhead et al. 2012; Chen et al. 2014). In Russia, there is a physical education program for schoolchildren in grades 1-11 (Lyakh 2013).

However, there are some problems in implementing the goals and objectives of the physical education program, such as insufficient material resources, including a sports hall. Not every school has a large, bright and spacious sports hall that would comfortably accommodate the entire class of schoolchildren. In this regard, exercise Classics was developed, which proved its effectiveness (Polevoy 2019).

Exercise Classics allow one to increase the emotional background of classes and motor activity of schoolchildren, especially in primary

school age, which is sensitive for the development of most physical abilities, including coordination abilities. The natural increase in the indicators of coordination abilities reaches its maximum values in primary school age (Viru et al. 2006; Charles et al. 2011).

Coordination abilities are the capabilities of an individual that determine their readiness for optimal control of their motor actions. A high level of development of coordination abilities allows a person to effectively solve motor tasks, save its movement, preventing injuries at home, at work and in sports. Coordination abilities play an important role in sports that require the ability to adapt to rapidly changing situations (like sports games) (Lyakh 2011; Tuchak 2018).

The differentiated approach that is used in school education is also taken into account when performing the exercise Classics. This approach is important, as it allows one to unlock the potential of physical abilities of schoolchildren and increase their activity in the physical education lesson (Breuer et al. 2011; Barker et al. 2015).

Some authors suggest replacing the standard physical education programs at school, but in the researchers' opinion, they need to be supplemented only slightly (Chiodera et al. 2008; Dobbins et al. 2013; Dallolio et al. 2016).

The influence of physical activity and sports activities on mental processes has taken place in some studies. The authors proved that physical education and sports improve the indica-

tors of mental processes (Gerber et al. 2012; Chang et al. 2017; Pietsch et al. 2017). Also, children who were physically active had higher scores for theoretical tasks than those who were less engaged in physical education and sports (Esteban Cornejo et al. 2014; Carral et al. 2016)

However, it was important for one to know not only the level of development of coordination abilities of school children, but also the impact of exercise Classics on mental processes of children, such as the ability to concentrate.

Aim

To determine the influence of exercise Classics on the development of concentration abilities of children 9-10 years old.

Hypothesis of the Study

It is assumed that if one uses the exercise Classics in physical education lessons, the indicators of concentration of schoolchildren attention will improve.

MATERIAL AND METHODS

Participants

The pedagogical study involved 40 boys and girls aged 9-10 from the third grade in school number 60 (Russia). All schoolchildren were in good health and were allowed to take physical education classes.

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

Procedure

The pedagogical experiment continued throughout the school year (9 months). Lessons were held twice a week for forty minutes each lesson. A total of 56 physical education classes were held.

Before the beginning of the pedagogical experiment, two groups were formed. In the first group (Control Group (CG)) there were schoolchildren from class 3A (20 children), and schoolchildren in this class were engaged in the main program of physical culture (Lyakh 2013).

In the second group (Experimental Group (EG)) there were schoolchildren from class 3B (20 children), wherein schoolchildren in this class were engaged in the main program, but additionally performed the exercise Classics at each lesson. The exercise is presented in Table 1.

Table 1: Exercise classics

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

Exercise Classics

In the gym, there are three large squares on the floor. The side of one square is 180 cm. and the inside each large square there are nine small squares. The side of the small square is 60 cm. and the inside each small square are numbers from 1 to 9.

Task

The schoolchild must use jumps from square to square to get from number 1 to number 2, then to number 3, and so on, to number 9. After that, he/she should jump on the same squares in reverse order (from number 9 to number 1). They can move around the squares in any way (from one leg to the other, jump on one leg or on two). If the schoolchild makes a mistake, he returns to the previous square. During the lesson, each schoolchild must overcome three large squares. The teacher must change the numbers in the squares before each lesson. They can perform the exercise during any part of the lesson.

Before and after the pedagogical experiment all schoolchildren took control tests:

1. Shuttle run 3x10 m (indicator of coordination abilities) (Polevoy 2017).
2. Methodic «Bourdon test» (indicators of concentration). Numbers from 1 to 9 are shown in random order on a piece of paper (Table 2) (Book and Shirm 1997).

Task: Quickly cross out a certain number, for example, the number 8 for 5 minutes. The number of crossed out and skipped digits are calculated. Concentration indicators are determined by the formula: $C = (N1 - N2 - N3) : N \times 100\%$

Table 2: Fragment of the Bourdon Test

5 9 7 5 3 7 6 9 4 6 8 5 4 2 1 3 5 6 8 9 7 5 4 5 3 8 2 5 3 7 6 9 4 6 8 5 4 2 1 3 5 6 8 9 5 3 8 2 4 6 5 9 8 3 7 6 4 5
7 5 4 6 7 9 8 7 9 8 5 6 4 2 4 3 3 2 4 3 7 6 8 2 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 8
3 3 7 6 4 9 8 6 7 5 2 4 3 5 5 3 8 2 5 3 7 6 9 4 6 8 5 4 2 1 3 5 6 8 9 5 3 8 2 4 6 5 9 8 3 7 6 4 5 7 5 4 6 7 9 8 7 9
8 5 6 4 2 4 3 3 2 4 3 7 6 4 9 8 6 7 5 6 3 2 1 6 3 9 5 9 7 5 9 7 5 6 3 6 1 2 9 7 5 3 8 2 4 6 5 9 8 3 7 6 4 5 8 9 7 5 4
5 3 8 2 4 6 5 9 9 8 3 7 6 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 8 3 3 7 6 4 9 8 6 7 5 2 4 7 5 2
4 3 5 7 5 4 9 7 5 3 2 8 7 3 0 5 2 9 8 5 2

Where,

C: concentration of attention

N1: the number of digits crossed out correctly

N2: number of missing digits

N3: the sum of digits that were crossed out incorrectly

N: the total number of digits in the viewed rows to cross out

Scale for assessing the concentration of attention:

Excellent: 81-100%

Good: 61-80%

Medium: 41-60%

Poor: 21-40%

Very poor: 0-20%

Statistical Analysis

The programs that were used in the study include Biostat 2009 (statistical processing of results), Microsoft Excel 2016 (arithmetic mean), and t-student (parametric criterion, significance at $P < 0.05$) (Tong and Zhang 2012; Khusainova et al. 2016).

RESULTS

Before the beginning of the pedagogical experiment, all schoolchildren from grades 3A and 3B passed the control standards, and the difference between the indicators in the results of the study was not reliable ($P > 0.05$). However, after the end of the experiment, the difference between the indicators in EG (class 3B) reached reliable values ($P < 0.05$) (Table 3).

Table 3 shows that schoolchildren who took part in the regular physical education program

for regular schools improved their performance, but not significantly. For example, coordination abilities in CG increased by only 2.9 percent. The results in the concentration test also improved from 67.5 ± 5.3 to 73.1 ± 6.6 ($P > 0.05$). The results of the work of schoolchildren from class 3A in physical education classes according to the standard program indicate that it is not very effective for the development of children's concentration.

In EG, in which children were engaged in the standard program and performed the exercise Classics in each physical education lesson, there were significant and positive changes in both tests. Coordination abilities in the «Shuttle run» test improved from 9.9 ± 0.5 to 8.5 ± 0.4 ($P < 0.05$). Concentration indicators in the «Bourdon test» improved by 23.6 percent ($P < 0.05$). Such results in EG indicate the effectiveness of introducing exercises Classics in the educational process of physical culture at school. Exercise Classics has a positive and significant effect on the concentration of attention of younger schoolchildren.

The results of this experiment in CG show the effectiveness of the standard program in physical education lessons at school, as well as reflect the natural increase in the studied indicators in this age period. Indicators in the EG show the effectiveness of the exercise Classic's in physical education lessons in school with children of primary school age.

DISCUSSION

Close attention to health should be paid from early childhood. At school, in physical education classes, schoolchildren perform exercises

Table 3: Indicators of coordination abilities and concentration of attention of children 9-10 years

Test	CG				EG			
	Before	After	%	P	Before	After	%	P
Shuttle run 3x10 m (s)	10.2 ± 0.6	9.9 ± 0.5	2.9	$P > 0.05$	9.9 ± 0.5	8.5 ± 0.4	14.1	$P < 0.05$
Bourdon test (%)	67.5 ± 5.3	73.1 ± 6.6	8.3	$P > 0.05$	69.4 ± 5.7	85.8 ± 4.9	23.6	$P < 0.05$

that promote their comprehensive development and prepare them for physical difficulties that may arise in the course of their social life. The value of a physical education lesson in school is very high (Carpenter and Morgan 1999; Wallhead et al. 2012; Chen et al. 2014).

Standard physical education programs in schools in Russia cover a significant range of schoolchildren knowledge and skills that need to be developed day by day. It is true that the programs are partially imperfect, but some authors see the solution to this problem in the complete replacement of existing programs (Chiodera et al. 2008; Dobbins et al. 2013; Dallolio et al. 2016). In the researchers' view, this approach is wrong. The physical education program can be modified or supplemented. One of the most effective additions to the standard program is the use of exercise Classics in physical education classes at school. This exercise has a positive effect on the development of the leading physical qualities of children, especially increases the level of development of coordination abilities of schoolchildren (Polevoy 2019).

In this study, with the help of exercise Classics, the effectiveness of the influence of physical exercise on the development of mental processes is proved. Previously, this hypothesis was confirmed by some authors (Gerber et al. 2012; Chang et al. 2017; Pietsch et al. 2017). The positive impact of physical education at school is proved not only on the development of mental processes, but also as a result, the acquisition of positive ratings as a result of intellectual activity (Trudeau and Shephard 2008; Esteban Cornejo et al. 2014; Carral et al. 2016).

The level of development of coordination abilities is especially important for children of school age, as this period is favourable for the development of most physical and coordination qualities. This is evidenced by previous research (Viru et al. 2006; Charles et al. 2011).

In addition, one should not underestimate the effectiveness of using game and competitive methods in physical education classes at school, which not only increase the emotional background, but also further motivate schoolchildren to improve their own physical conditions (Serra-Olivares et al. 2016).

The effectiveness of using a differentiated and individual approach in classes with children

has been proven previously by several studies (Breuer et al. 2011; Barker et al. 2015; Kühnhausen et al. 2016). Of course, the current experiment confirmed this. This approach to children allows them to improve performance selectively, and raise the physical health bar for each schoolchild to their own level.

CONCLUSION

Thus, if at each physical education lesson in school children will perform exercise Classics, then their coordination abilities will improve, as well as their concentration indicators will improve.

RECOMMENDATIONS

This exercise is a great addition to the standard physical education program at school. The research is relevant and promising for studying in the field of sports and physical culture.

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Paper received for publication in July, 2020
 Paper accepted for publication in October, 2020