

THE INFLUENCE OF PHYSICAL EDUCATION AT SCHOOL ON THE ATTENTION OF STUDENTS AGED 15-16 YEARS

O IMPACTO DA EDUCAÇÃO FÍSICA NA ESCOLA NA ATENÇÃO DE ESTUDANTES DE 15 A 16 ANOS

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ABSTRACT

Objectives: the influence of physical activity in physical education lessons on the attention indicators of schoolchildren. **Material and Methods:** 141 students, aged 15-16, who studied in the 9th grade, took part in the experiment. The main research method was the “Trondyke Test”, which determines the level of attention development of students. The test was used before and after the physical education lesson 1 time per month for 5 months. **Results:** students who did not engage in physical education in the lesson were not able to significantly improve their performance in the test, which indicates a possible adaptation to the test after its first performance before the lesson. Students who were engaged in physical exercises could significantly increase the test results. **Conclusion:** the results obtained determine the effectiveness of the influence of a physical education lesson at school on the indicators of students attention. This study will serve as an additional motivation for students to engage in physical culture, since the impact of physical exercises has a positive effect not only on the development of physical qualities, but also on the attention of schoolchildren. **Level of Evidence III; Retrospective Comparative Study.**

Keywords: Health; Mental processes; Physical Education and Training; Physical Exercise; Students.

RESUMO

Objetivos: a influência da atividade física nas aulas de Educação Física nos indicadores de atenção dos escolares. **Material e métodos:** participaram do experimento 141 escolares, de 15 a 16 anos, que estudaram na 9ª série. O principal método de pesquisa foi o “teste de Trondyke”, que determina o nível de desenvolvimento da atenção dos escolares. O teste foi utilizado antes e depois da aula de Educação Física uma vez por mês durante 5 meses. **Resultados:** Os estudantes que não praticaram Educação Física na aula não conseguiram melhorar significativamente seu desempenho no teste, o que indica uma possível adaptação ao teste após sua primeira apresentação antes da aula. Os estudantes que estavam envolvidas em exercícios físicos foram capazes de aumentar significativamente os resultados do teste. **Conclusão:** os resultados obtidos determinam a eficácia da influência de uma aula de Educação Física na escola nos indicadores de atenção das crianças. Este estudo servirá como uma motivação adicional para os estudantes se envolverem na cultura física, uma vez que o impacto dos exercícios físicos tem um efeito positivo não apenas no desenvolvimento das qualidades físicas, mas também na atenção dos alunos. **Nível de Evidência III; Estudo Comparativo Retrospectivo.**

Descritores: Saúde; Processos Mentais; Educação Física e Treinamento; Exercício Físico; Estudantes.

RESUMEN

Objetivos: la influencia de la actividad física en las clases de educación física en los indicadores de atención de los escolares. **Material y métodos:** Participaron en el experimento 141 escolares, de 15-16 años, que cursaban el noveno grado. El principal método de investigación fue la “Prueba de Trondyke”, que determina el nivel de desarrollo de la atención de los escolares. La prueba se usó antes y después de la lección de educación física una vez al mes durante 5 meses. **Resultados:** los jóvenes que no participaron en educación física en la lección no pudieron mejorar significativamente su rendimiento en la prueba, lo que indica una posible adaptación a la prueba después de su primera actuación antes de la lección. Los escolares que realizaban ejercicios físicos pudieron aumentar significativamente los resultados de la prueba. **Conclusión:** los resultados obtenidos determinan la efectividad de la influencia de una lección de educación física en la escuela sobre los indicadores de atención de los escolares. Este estudio servirá como una motivación adicional para que los estudiantes participen en la cultura física, ya que el impacto de los ejercicios físicos tiene un efecto positivo no solo en el desarrollo de las cualidades físicas, sino también en la atención de los escolares. **Nivel de Evidencia III; Estudio Comparativo Retrospectivo.**

Descritores: Salud; Procesos Mentales; Educación y Entrenamiento Físico; Ejercicio Físico; Estudantes.



INTRODUCTION

The topic of children's health and development is always relevant.^{1,2} From early childhood and throughout life, people try to make their health stable, stable to the effects of adverse factors of course, this is achieved in many ways. For example, there is such a thing as a healthy lifestyle. It includes such components as; Physical activity; Proper nutrition; Healthy sleep; Giving up bad habits; and some other factors.

Such a classification is offered by a fairly large number of studies. At the same time, the percentage of components practically does not change. However, none of the researchers ranked physical activity last in importance, noting its value for human development and health.^{3,4}

Unfortunately, today, children who enroll in colleges and universities after school increasingly have a preparatory or special health group. Children with the main health group, which allows them to engage in physical culture and sports without restrictions, began to meet less frequently. At the same time, these are not only congenital problems and pathologies, most of them are acquired health problems, such as obesity, hypertension, that is, for the most part, a consequence of a sedentary lifestyle.^{5,6} At the same time, a sedentary lifestyle since childhood leads to an increase in chronic diseases, a decrease in functional and physical fitness.^{7,8} Thus, it is important to form children's desire and needs for physical culture and sports from childhood.⁹

One of the most important tasks of physical culture is the development of motor skills and increasing the level of physical fitness.^{10,11}

Physical education lessons at school are indispensable tools for the implementation of such a component of a healthy lifestyle as physical activity. A lesson at school is mandatory to attend and is conducted under the influence and supervision of a teacher.¹² A fairly large number of studies have been presented on the benefits of physical education lessons at school for the development of physical qualities (strength, speed, motor abilities, endurance, flexibility, and others). The authors note the effectiveness of a particular methodology, school curriculum for the development of physical qualities of schoolchildren of different genders and ages.^{13,14}

Some studies mention that physical activity has a positive effect not only on the development of physical qualities, but also on the development of cognitive and some mental processes.¹⁵⁻¹⁷ It is known that physical exercises have proved to be an effective means for developing the creative abilities of schoolchildren.^{18,19}

The aim of our study is to determine the influence of physical activity in physical education lessons on the attention indicators of schoolchildren. Perhaps this would serve as an additional motivation for schoolchildren to take physical education classes at school, college or university.

Research hypothesis: it is assumed that the motor activity of schoolchildren at a physical education lesson has a positive effect on the indicators of schoolchildren's attention

MATERIAL AND METHODS

The study involved ninth grade students of secondary school number 60 (Kirov, Russia), aged 15-16 years. A total of 141 students took part in the pedagogical experiment. The 9th grade students are graduates of the school and treated the study with maximum responsibility, all exercises and tests were performed consciously. The pedagogical study involved children regardless of gender and age, weight and height and level of physical fitness. Children with basic and preparatory health groups were admitted to physical education classes by the doctor. All procedures met the ethical standards of the Declaration of Helsinki.²⁰ Informed consent was obtained from all parents of the children included in the study. This study was approved by Research Ethics Committee, Vyatka State University from the record of the meeting of the ethics committee on January 17, 2022 №1.

The study was conducted for five months (January – May 2022). According to the schedule, physical education classes in the ninth grade were held 2 times a week for 45 minutes according to the physical education curriculum at the school for children of grades 1-11.¹²

The current study did not take into account the favorable period and the natural increase in attention indicators in children. Differentiation of children into control and experimental groups was not provided. In our study, the main fact was the active physical participation or non-participation of the student in the process of physical education. Therefore, only the impact of physical activity of schoolchildren on their attention indicators was considered. All physical exercises were performed under the supervision of a physical education teacher. Before the lesson, the children sat down in a regular classroom and performed the "Trondyke test" for 2 minutes.²¹

There are 70 three-digit numbers in any order in front of the student (Table 1). Within 2 minutes, the student must find and cross out the numbers given by the teacher. The numbers can be searched in any order. The numbers changed each time. There are no duplicate numbers in the main table.

the number of correctly crossed out numbers within 2 minutes. Before the start of the physical education lesson, testing was conducted in order to assess the current level of attention. After the end of the physical education lesson, the children sat in the same class and performed this test again. After the end of the physical education lesson, testing showed the effect of children's active activity on attention indicators. It should be noted that the time interval (before and after the lesson) was not chosen by chance, since during the day or week students carry out other activities that could affect the test results. For the accuracy of the result, the procedure was performed once in the middle of each month from January to May. All students took the test, including those who were not allowed to attend classes for one reason or another. But, as a rule, such children are simply present at the lesson, without active participation in it. Children who were not present at school on the day of the test were not included in the results.

Mathematical and statistical processing of results

All the indicators of schoolchildren according to the test results were entered in an Excel spreadsheet. The average value of the indicators before and after the study and their percentage increase were determined, the reliability of the increase in indicators was determined by the Student's T-criterion ($p > 0.05$).

RESULTS

Before the beginning of the physical education lesson and after its completion, all children passed the control "Trondyke Test". The test results are presented in Table 2.

Table 1. Fragment of the "Trondyke test".

Find and cross out these numbers in the main table									
051	214	263	584	117	533	519	309	073	638
Main table									
573	371	672	615	714	284	179			
385	117	295	369	503	519	016			
703	649	104	491	274	439	667			
048	309	482	263	023	184	358			
561	691	316	625	653	193	082			
392	554	031	327	093	341	205			
683	129	548	416	333	073	168			
584	404	051	427	468	154	527			
259	591	137	069	145	214	447			
638	246	473	533	231	459	606			

Table 2. "Trondyke test" results.

Month	Physical education lesson	Number of children in lessons	Test before the lesson	Test after the lesson	%	p
January	engaged	361	7.1	8.2	15.2%	<0.05
	not engaged	34	8.1	8.3	2.3%	>0.05
February	engaged	348	7.4	8.6	16.4%	<0.05
	not engaged	41	7.6	7.8	2.8%	>0.05
March	engaged	372	7.5	8.8	17.1%	<0.05
	not engaged	33	7.4	7.5	1.9%	>0.05
April	engaged	368	7.8	9.1	16.1%	<0.05
	not engaged	29	7.9	8.2	3.1%	>0.05
May	engaged	350	7.9	9.1	14.9%	<0.05
	not engaged	42	7.5	7.7	2.8%	>0.05

Table 2 shows that children who did not engaged, but completed the test, were able to improve their performance only slightly. This trend is observed every month. On average, the indicators improved from 1.9% to 3.1% ($p>0.05$). The situation is different for children who were engaged in a physical education lesson. In each of the five months, the test indicators improved significantly, on average from 14.9% to 17.1% ($p<0.05$).

Such results of the pedagogical experiment indicate the effectiveness of the influence of physical exercises and physical education lessons on the attention of schoolchildren.

DISCUSSION

The aim of this study was to determine the effect of physical activity of schoolchildren on their attention indicators. The main conclusion of this study is that children who were engaged in physical education were able to significantly improve their attention indicators. Of course, this indicates the effectiveness of the influence of a variety of physical exercises on attention indicators. Children who did not do physical exercises in the physical education lesson were not able to significantly improve their performance in the Thorndike test. This can probably be explained by the fact that performing the test before the start of the lesson served as some kind of training or adaptation to it, since all the children performed it again after the physical education lesson. This trend was observed throughout the study.

A review of the literature on the problem shows the relevance of the issue of the health and development of children.^{1,2} Physical education

has a great importance on the sedentary lifestyle of children.^{3,4} Despite the fact that a fairly large number of studies prove the effectiveness of physical education lessons for the health of children and the development of their physical qualities,^{13,14} there are studies that speak about the impact of physical exercise on development of cognitive processes.¹⁵⁻¹⁷ and creative abilities of children.^{18,19} However, it is also important that physical exercises have an impact on some mental processes, which is confirmed by some studies conducted.^{22,23}

In this study, for the first time, the influence of a physical education lesson at school on attention indicators is investigated. During the study period, attention indicators improved in each month, regardless of the goals and objectives of a particular lesson, whether it was athletics, endurance running, forward somersault or the use of outdoor games, or sports games as a means of physical culture in the lesson. From a physiological point of view, in all likelihood, physical exercise increases the activity of metabolic processes.^{2,3} Under the influence of physical exercises, blood circulation improves,²⁴ as a result of which mental processes are mobilized.

The results obtained will serve as additional motivation for physical education classes, since in the process of motor activity not only physical qualities develop, but also the attention of children. This study is relevant and promising for further study of the health and physical activity of children at school, as well as its impact on mental and cognitive processes.

CONCLUSION

This study examines the problem of children's health, their sedentary lifestyle. The role of the physical education lesson for the health and development of schoolchildren is determined. As a result of the study, the effectiveness of the influence of physical activity of schoolchildren in the physical education lesson on the attention indicators of schoolchildren has been proved. In the future, research should focus on the impact of physical activity and physical activity in physical education lessons not only on the physical qualities of schoolchildren, but also on different mental processes of children of different ages.

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