Relationship between indicators of motor activity and physical workability of primary school students

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Abstract
Objective of the study was to reveal the relationship between indicators of motor activity and physical performance of primary school students.
Methods and structure of the study. The experiment involved 60 primary school students in Belgorod and the Belgorod region. In the course of the study, the physical performance of primary school students was determined according to the one-stage step test PWC_{170} and the value of the pulse debt accumulation index (PDI). The shagometry method consisted in counting the number of movements of primary school students during the day. To obtain objective data on the average daily volume of physical activity of students, fitness bracelets with a pedometer function were used. To determine the presence or absence of a linear relationship between the indicators of motor activity and physical performance of primary school students, the method of parametric statistics was used - the Pearson correlation coefficient.
Results and conclusions. The results of the correlation analysis made it possible to state the absence of influence on the improvement of the indicators of physical performance of younger schoolchildren only by the volume of physical activity. The solution to this problem is possible by changing the nature and intensity of physical activity of students during organized at school during the school day and independent physical education classes.

Keywords: *motor activity, physical performance, hypokinesia, primary school students, full-time school.*

Introduction. Hypokinesia in childhood, as noted by S.V. Grudina interferes with the normal and timely development of the functional capabilities of their growing organisms. Inhibition in the development of organs and structures of the body leads to the development of various deviations [2].

Educational opportunities, intellectual and motor abilities of children of primary school age largely depend on the level of development of physical and mental performance. Younger schoolchildren with a high level of working capacity study well at school, get sick less and miss classes. In addition, high working capacity allows them to master various skills, habits, methods of action without stress, ensures the development of physical and moral-volitional qualities [1].

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Results of the study and their discussion. Determination of indicators of the average daily volume of physical activity and physical performance of primary school students was carried out in schools in Belgorod and the Belgorod region with different working hours (Table 1). Thus, in a full-time school (school

Table 1. *Indicators of motor activity and physical performance of primary school students*

Indicators	school 1, M ± m	school 2, M ± m	t	p
Volume of physical activity	12957±749	10095±312	3,53	<0,01
PWC_{170}	327,38±11,75	362,9±15,9	1,79	>0,05
Pulse Debt Accumulation Index (PDAI)	1,123±0,048	1,261±0,062	1,75	>0,05

1), the average daily volume of physical activity of junior schoolchildren was 12957 steps/day, which is significantly higher than this indicator by 2862 steps/day for students studying in a regular school (p<0.01).

According to academician A.G. Sukharev, the daily rate of motor activity for children aged 6–10 years is 15,000–20,000 steps/day [3]. When comparing the revealed indicators of the average daily volume of motor activity of students of both schools with the daily norm of motor activity of children of this age, it can be noted that even in a full-time school, elementary school students are not provided with an optimal motor regime that would satisfy the daily need for movement of younger students.

The determination of the general physical performance was carried out according to the modified method of L.I. Abrosimova. The revealed indicators of PWC_{170} and PDAI indicate that the results of the single-stage step test are within the normal range for children of this age and do not have significant differences between students in the elementary grades of a full-time school and a regular school.

In order to determine the presence or absence of a linear relationship between the indicators of motor activity and physical performance of primary school students, a correlation analysis of the data obtained was carried out (Tables 2, 3). The revealed results indicate a weak correlation at a non-significant level of significance between the indicators of the volume of physical activity and PWC_{170}, the volume of physical activity and PDI (p>0.05) of primary school students in both schools.

It should be noted that the indicators of the volume of physical activity of students in a full-time school are significantly higher than this indicator of students in a regular school, but they also have a weak correlation between indicators of physical activity and physical performance. This fact can be explained by

the fact that in junior schoolchildren, an increase in physical performance indicators is possible not only by increasing the volume of motor activity, but also by changing its nature and intensity during organized at school during the school day and independent physical education classes.

Conclusions. As a result of the study, it was revealed that the indicators of the average daily volume of physical activity of students from both schools are lower than the daily norm of motor activity of children of this age. The conducted correlation analysis indicates a weak correlation between the indicators of the volume of physical activity and physical performance of primary school students in both schools (p>0.05).

The solution to this problem is possible by changing the nature and intensity of physical activity of students during organized at school during the school day and independent physical education classes.

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Table 2. *Interrelation of indicators of motor activity and physical performance of primary school students (school 1)*

Coefficient correlations	PWC_{170}	PDI
r	0,07	0,05
p	>0,05	>0,05
connection strength	weak	weak

Table 3. *Interrelation of indicators of motor activity and physical performance of primary school students (school 2)*

Coefficient correlations	PWC_{170}	PDI
r	0,32	0,1
p	>0,05	>0,05
connection strength	weak	weak