

MYKHNO L.

A. S. Makarenko Sumy State Pedagogical University

THE ASSESSMENT OF SOME PARAMETERS OF PHYSICAL HEALTH OF PRIMARY SCHOOL PUPILS

Abstract. Purpose: *to determine the level of somatic health and adaptive-reserve capabilities of organism of primary school pupils. Material and Methods:* *physical health level was determined by the means of H. L. Apanasenko method. The methodology developed by S. V. Hosak and O. T. Elizarova was used for estimation the level of pupils' adaptation to environment. The study involved 55 pupils 6–7 years (27 boys and 28 girls) enrolled in 1-A and 1-B forms of comprehensive school № 7, Shostka, Sumy region. Results:* *it was determined that characteristics of physical health of most pupils of primary school conform to levels from low to medium, and most pupils have medium level of adaptive capabilities. Conclusions:* *there is an urgent necessity in organization and conduct of purposeful sports and preventive measures that contribute to improving health and adaptive-reserve capabilities of the organism in junior school.*

Keywords: *pupils, primary school, level of physical health.*

Introduction. Modern scientific researches testify to the considerable deterioration of a state of health of the population of Ukraine for the last decade. The growth rate of sickness among children and youth is the highest, in comparison with other age groups. So, about 90% of children have a deviation in a state of health, over than 59% – unsatisfactory physical fitness according to MHC of Ukraine. In recent years the sickness of children increased by 25,4%, and teenagers – on 23,7% [6].

Together with such factors as genetic tendency, adverse social and ecological conditions, essential influence on health of pupils have factors that which are directly connected with the studying process at school. Experts connect till 40% of children's and youthful pathologies exactly with a negative action of these factors to which the intensification and the irrational organization of the educational process belong, the discrepancy of techniques of study to century and psychological features of pupils and etc. [1].

According to experts, one of the main factors which negatively influence a state of health of children is a deficiency of physical activity which is observed already at a young school age [4]. Foreign experts call a physical divergence the leading risk factor of the development of diseases [11].

As the statistics testifies, the level of physical activity sharply decreases when a child goes from a kindergarten to a school, as a result – the state of health of the child worsens [1]. Specialists of the World Health Organization note the need to devote to physical activity of children at least 60 minutes per day. According to scientists, it

will promote the preservation of health, will allow adapting quicker in the society, and will develop strong-willed qualities of a child [9].

Studying of a state of health of children and youth in the interrelation with physical training is extremely important for the justification of prophylactic- health-improving actions, the definition of the content of classes on physical exercises, for strengthening of health of a growing up generation [4].

Therefore the researches are relevant during of which there will be a certain level of physical health and adaptation and reserve opportunities of organisms of pupils of the first classes of the comprehensive school.

Communication of the research with scientific programs, plans, subjects.

This work is included into the direction of the research of the chair of TMPC of educational- scientific IPC of Sumy A.S. Makarenko state pedagogical university – "The increase of the level of health and physical fitness of different groups of the population by means of physical culture", Institute of scientific- technical and economic information in Kyiv approved by the department of the state registration of Ukraine, the number of the state registration is 0111U005736.

The aim of the research: to estimate the level of physical health and adaptation- reserve opportunities of organisms of pupils of the first classes of the comprehensive school.

Research tasks:

1. To carry out a complex assessment of physical health, having defined Robinson's index, results of functional tests, a tone of activity of muscular tissue and compliance of a body weight of pupils to body length.

2. To find out a degree of the adaptability of organisms of pupils for conditions of the environment and the efficiency of the educational process at school.

3. To find the interrelation level between the level of somatic health and the level of adaptation- reserve opportunities of organisms of pupils.

Material and methods of the research. The object of the research became indicators of physical health of 55 pupils of the first classes of the comprehensive school No. 7 in Shostka of the Sumy area (28 girls and 27 boys). The technique of G. L. Apanasenko was used for the purpose of the determination of the level of physical health [1]. The technique of S. V. Gozak and O. T. Yelizarova was used for an assessment of adaptation- reserve opportunities of organisms of pupils used [2].

The choice of techniques is caused by their availability to the practical use and the sufficient informational content to forecasting of the sickness of children which gives the chance to carry out preventively improving actions in the system of physical training.

Results of the research and their discussion. Indicators of a body length and a body weight of pupils, thorax volume at rest of the vital capacity of lungs, heart rate, systolic and diastolic arterial pressure, dynamometry of the strongest hand, a breath delay time on a breath and an exhalation were estimated during the research.

It is known that an important indicator of physical development of the child is proportionality of the sizes of a body [7]. The percentile method of an assessment showed to thorax perimeter depending on a growth that 70,4% of boys and 39,3% of girls have harmonious physical development. Other first-graders have not respectively thorax perimeter to a body length. So, high rates of a thorax perimeter have 3,6% of girls and 11,1% of boys. Above the average values have 14,4% of girls

and 3,7% of boys. 17,8% of girls and 7,4% of boys got to the area of sizes below the average. Low indicators of volume of a thorax depending on a body length have 7,4% of boys and 17,8% of girls. Very high rates of volume of a thorax have 7,1% of girls, somatoscopy testifies to the existence of an obesity at these girls.

By means of the percentile method of an assessment to thorax perimeter depending on the growth it was established that the percent of boys who have a harmonious constitution, is much more, than percent of girls is. In our opinion, it is connected with that girls, since the younger school age feel much more deficiency of physical activity, than boys do.

It is established that in most of first-graders indicators of heart rate (by V. K. Tatochenko, 1997) are in limits of the age norm (57,1% of girls and 55,5% of boys), slight bradycardia is found in 7,1% of girls and 18,5% of boys, moderate bradycardia, – in 3,7% of girls and 11,1% of children. Slight tachycardia is found in 25% of girls and 11,1% of boys, moderate tachycardia, – in 3,7% of boys, considerable tachycardia, – in 7,1% of girls [3].

Indicators of the vital capacity of lungs estimated in the ratio with the standard values calculated for each pupil by a formula of Ludovic (V. S. Yazlovetsky, 1991). The value of the vital capacity of lungs of most of pupils (63,4% of girls and 88,9% of boys) is exceeded by standard indicators that points to a high functional condition of lungs. At the same time the value of the vital capacity of lungs norms are lower in 35,7% of girls and 11,1% of boys [4].

The received average indexes of Shtange's and Genchi tests are also lower than norm, both at boys, and at girls, in norm [4] the duration of a delay of breath on a breath at children of 7-11 years old makes 30–35 s, on an exhalation – 20–39s.

The reliability of differences of average sizes of indicators of groups of boys and girls was defined by calculation of Student criteria (t). At the set reliability of $P=0,95$, $t_{gr.} = 2,064$. Having analyzed data, we defined that the majority of indicators of a physical condition of children of 6-7 years old have no reliable statistical differences depending on a sex. The exception is made only indicators of heart rate and vital capacity of lungs (HR is lower at boys, than at girls, and the vital capacity of lungs is bigger) (tab. 1).

Table 1

Midgroup indicators of a physical condition of pupils of the first classes

№	Category	Boys		Girls		t	$t_{gr.}$
		\bar{X}	σ	\bar{X}	σ		
1	Body length, sm	120,9	5,9	122,75	5,2	1,244	2,064
2	Body weight, kg	23,1	3,2	23,5	3,7	0,432	2,064
3	Size of thorax, sm	59,2	3,1	58,5	4	0,729	2,064
4	Heart rate, bpm^{-1}	88	8,8	92	9,6	2,135	2,064
5	Blood pressure systolic, mm mer.col.	90	9,9	87	7,8	1,632	2,064
6	Blood pressure diastolic, mm mer.col.	57	9,3	57	7,6	0	2,064
7	Vital capacity of lungs, ml	1399	229	1377	186	2,471	2,064
8	Dynamometry of the strongest hand, kg	13,7	4,7	12,6	4,8	0,817	2,064
9	Shtange's test, s	20,8	4,5	21,4	7	0,404	2,064
10	Genchi's test, s	12,9	3,9	14,5	4,9	1,230	2,064

Five indicators were defined during the complex estimation of physical health: indexes of Ruffier and Robinson, vital and power indexes, compliance of a body weight to a body length. The research showed that first-graders have the best indicators in a power index. But the worst results were shown by pupils in Ruffier test, both boys, and girls. These data testify that the vast majority of pupils of the first class have a below the average level and a low level of physical working capacity. Therefore, there is an urgent need of the organization and carrying out with them the directed sports and preventive actions.

The percentage ratio of pupils by the level of functional indicators is defined as a result of the analysis of the obtained data (tab. 2).

Table 2

Distribution of pupils of the first classes by the level of functional indicators, %

№	Level	Boys				Girls			
		VI	PI	Index of Robinson	Index of Ruffier	VI	PI	Index of Robinson	Index of Ruffier
1	High	7,4	44,4	25,9	0	3,6	50	28,6	0
2	Above the average	18,5	7,4	25,9	0	39,3	3,6	17,8	0
3	Average	48,2	7,4	14,8	14,8	39,3	10,7	28,6	7,1
4	Below the average	14,8	14,9	14,8	59,3	17,8	7,1	10,7	64,3
5	Low	11,1	25,9	18,6	25,9	0	28,6	14,3	28,6

Note. VI – vital index, PI – power index

During the research it was found out that most of pupils have low, below the average and average level of physical health. So, only 3,6% of girls and 11,1% of boys have above the average level of health. The average level of health is established in 57,1% of girls and 37% of boys, below the average – in 17,9% of girls and 33,3% of boys. The low level of health is found in 21,4% of girls and 18,6% of boys. Pupils with the high level of health aren't found among first-graders.

As the vast majority of first-graders (96,4% of girls and 88,9% of boys) got to the group of risk according to the estimation of the level of somatic health, we conducted additional researches, which defined the degree of the adaptability of children for conditions of the environment.

It is established that 100% of girls and 92,6% of boys who study in the first class, feel tension of mechanisms of adaptation. So, only 7,4% of boys have the high level of adaptation- reserve opportunities of organisms, 85,7% of girls and 70,4% of boys have the average level. Critically the low level of adaptation is established in 14,3% of girls and 22,2% of boys.

The strong correlation dependence between the level of adaptation-reserve opportunities of organisms and the level of somatic health of first-graders is established. So, the indicator of correlation makes $r=0,60$ at boys, girls have $r=0,69$.

Conclusions. The accounting of the level of physical development, somatic health and nature of adaptation to the environment conditions, gives the chance more to individualize the process of physical training of children of the school age.

The confirmed data of a number of authors are that a state of somatic health of most of first-graders is below the "safe" level during the research. It is established that the vast majority of pupils of the first classes got to the group of risk of rather possible failure of adaptation which will lead to even bigger deterioration of a state of health. Therefore, there is an urgent need of the organization and carrying out with them the directed sports and preventive actions which will promote the increase of the level of health and adaptation- reserve opportunities of an organism.

Prospects of the subsequent researches. In the subsequent the influence of the developed by us technology of the use of means of yoga-aerobics in physical training of pupils of the first classes of the comprehensive school [5] will be experimentally checked for the level of indicators of physical development, physical health and physical fitness.

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Received: 10.01.2015.

Published: 28.02.2015.

Lyudmila Mykhno: *Sumy State Pedagogical University named after A. S. Makarenko:*
Romenska str. 87, Sumy, 40002, Ukraine.

ORCID.ORG/0000-0001-6340-8570

E-mail: l_mykhno@ukr.net