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Status of Some Physiometric Indicators in Urban School Students

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Abstract: The article presents the results of a study of some physiometric parameters in urban school students. It studied the functional parameters of the cardiovascular and respiratory systems in 11, 16 and 18-year-old schoolchildren, as well as the Rufye test, the adaptive potential of the circulatory system. The results obtained were compared with the standard sizes and appropriate conclusions were drawn. The study provides recommendations for improving students' physical development and health.

Key words: physiometric indicators, cardiorespiratory system, pulse, arterial blood pressure, Genchi test, Stange test, Rufier test, adaptive potential of the circulatory system.

Introduction

Young people are the future of any society. Accordingly, every state must constantly take well-thought-out measures to protect the health of the younger generation and to raise a healthy and harmoniously developed generation. In recent years, this issue has become one of the most important issues for all countries in the world. In particular, it is important to make strategic investments for children aged 10-19 without delay [4]. Accordingly, we conducted some observational and research work on the study of physiometric parameters among schoolchildren in Karshi, Kashkadarya region.

Materials and methods

The study was conducted among 246 students aged 11, 16 and 18 years. Of those examined, 149 were boys and 97 were girls. Pupils aged 11, 16 and 18 were conditionally divided into groups 1, 2 and 3. A number of physiometric parameters were studied in the subjects during the study. These are pulse, systolic blood pressure, diastolic blood pressure, Gench and Shtange test, Rufye test, adaptive potential of the circulatory system. The results were compared and evaluated with benchmarks [2]. The results of the study were statistically processed and analyzed in the Statistical Functions section of the standard functions presented in Microsoft Excel 2013. In the subjects, pulse was determined by pulse oximeter, and blood pressure was determined by the Korotkov method. Based on these results, the indices for assessing the activity of the respiratory and cardiovascular systems were calculated using special formulas [5]. Pulse and blood pressure readings were compared with standard values, and the results of the Gench and Shtange tests, the Rufye test, and the adaptive potential of the circulatory system were compared with the standard values, and a percentage of the subjects were evaluated.

Results obtained and their analysis

Physiometric readings of schoolchildren showed a number of interesting cases. Table 1 shows some of the physiometric parameters obtained from the subjects and their relative status

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Table 1.

Physiometric parameters obtained in 11, 16, 18-year-old subjects difference from the norm

Indicators		**11 years old**		**16 years old**		**18 years old**	
		Boys, n=66	Girls, n=49	Boys, n=47	Girls, n=28	Boys, n=36	Girls, n=20
Pulse	The result obtained	81±0,25	85±0,4	76±0,4	82±0,5	74±0,5	75,6±0,8
	Norm	80	80	72	72	70	70
	Relative to the norm, %	101%	106%	105,5%	114%	105,7%	108%
Sistolic blood pressure	The result obtained	90±0,25	86,5±0,3	110±0,3	112±0,5	111±0,4	110±0,6
	Norm	101	101	112	112	120	120
	Relative to the norm, %	89%	85,6%	98%	100%	92,5%	91,6%
Diastolic blood pressure	The result obtained	56±0,2	56±0,3	62±0,3	70±0,6	71±0,4	70±0,6
	Norm	52	52	62	62	80	80
	Relative to the norm, %	107,6%	107,6%	100%	113%	89%	87,5%

The results showed that the highest pulse rate was observed in 16- and 18-year-old girls, while in other subjects it was close to the norm. In general, there is a gender difference: girls of all ages have slightly higher heart rates than boys.

Systolic blood pressure is lowest in group 1, 11 years old. Diastolic blood pressure, by contrast, is relatively low in group 3, 18-year-olds.

Table 2 shows the results of the study of the activity of the cardiorespiratory system in the subjects.

Table 2.

Physiometric parameters obtained in 11, 16, 18-year-old subjects position relative to the norm

Indicators		**11 years old**		**16 years old**		**18 years old**	
		Boys, n=66	Girls, n=49	Boys, n=47	Girls, n=28	Boys, n=36	Girls, n=20
Genchi test, %	Bad	23	20	-	8	5	13
	Average	8	23	4	8	17	25
	Good	38	23	38	23	22	37
	Excellent	31	34	58	61	56	25
Stange test, %	Bad	41	40	8	8	6	25
	Average	41	43	21	38	28	25
	Good	18	17	63	46	66	50
	Excellent	-	-	8	8	-	-
Rufier test, %	Safisfactory	23	40	29	38	-	12,5
	Average	51	53	42	46	72	75

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	Good	26	7	25	15	28	12,5
	Excellent	-	-	4	-	-	-
Adaptive potential of the circulatory system, %	Short	8	-	100	100	89	100
	Safisfactory	43	53	-	-	11	-
	Good	49	47	-	-	-	-

According to the results of the table, if we look at the Gench test, the best performance is observed in 16-year-old students, ie 58% of boys of this age are excellent and 38%. well, 61% of the girls had excellent results and 23% had good results. Overall, 96% of 16-year-old boys had good or excellent results, and 84% of girls of the same age had good or excellent results. The lowest results on the Gench test were observed in 11-year-old boys and girls (23% and 20% worse, respectively).

The results obtained on the Shtange test also almost replicate the results on the Gench test. In other words, the highest results are in 16-year-old boys and girls (71% are good or excellent and 54% are good or excellent, respectively). The lowest results were in 11-year-old boys (41% bad, 41% average) and girls (40% bad, 43% average). Such changes in respiratory function can be explained by age-related features, i.e., both trials are at their lowest in younger subjects. By the age of 16, respiratory function had improved. The results of the Rufe test have a specific appearance in the subjects. Of the 11-year-old subjects, 51% of boys were average, 26% were good, 53% of girls were average, and 7% were good. Similarly, in the 16- and 18-year-old subjects, the “average” result was the highest in both boys and girls: 42 and 46% in 16-year-old boys and girls, and 72 and 75% in 18-year-old boys and girls, respectively. The "good" result is much lower, and the "excellent" result is only 4% of 16-year-old boys. It can be said that the Rufe test, which represents the activity of the cardiorespiratory system, is moderate in most subjects of all ages[1,3].

The situation with the adaptive potential of the circulatory system in the respondents is as follows. The worst results here are in the 16- and 18-year-olds. In both sexes of 16-year-olds (100%) and in 18-year-old girls (100%), the adaptive potential of the circulatory system appeared to be reduced. Such a decline was observed in 89% of 18-year-old boys. In 11-year-old subjects, by contrast, the adaptive potential of the circulatory system was satisfactory and in good condition (49% of boys and 47% of girls were well).

The adaptive potential of the circulatory system, in contrast to the Rufe test, was reported to be much lower. In fact, this indicator shows the ability and level of adaptation of the organism to different environmental conditions. This means that while the activity of the cardiorespiratory system in schoolchildren is moderate, the level of adaptation of the whole organism to the external environment is much lower.

Conclusion

There are some changes in the physiometric parameters studied in schoolchildren, especially in the cardiorespiratory system. In particular, the ability of the organism to adapt to the changing conditions of the external environment is much weaker. In addition, age and gender differences in changes in cardiovascular activity are significant.

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