



Anthropometry of Schoolchildren

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Annotation: The results of physical development and the definition of harmonious development are presented 1617 school age. The main morphological and functional indicators of physical development were determined: height, body weight, chest circumference. A comprehensive assessment of physical development depending on sex and age was carried out.

Keywords: children, anthropometric indicators, physical development, harmonious development, preschool age.

Introduction

The most important tool for primary control over the health of children and adolescents is the individual and collective assessment of the growth and development of the younger generation. The simplicity and accessibility of study methods, the significant information content of the data obtained give the indicators of physical development the importance of an objective criterion for the sanitary and epidemiological well-being of the child population [4].

It is known that the level of physical development of children and adolescents is the main biological indicator of the influence of lifestyle factors, the environment, and educational technologies on their health [2]. At the same time, the state of the environment in industrial cities has recently changed not for the better, which cannot but affect the state of health and, accordingly, the rate of growth and development of the child population [3].

Numerous studies of the physical development of the child population testify to the heterogeneous processes of growth and development of children in different regions of Russia. Some authors point to an increase in the proportion of children with a low level of physical development due to the number of children with low body length and weight [1, 5, 6]. There is also evidence of an increase in the number of children with a decrease (in comparison with the average values) of the chest circumference, accompanied by developmental disharmony [5].

The assessment of physical development is based on a comparison of the child's individual characteristics with the so-called age-sex standards (norms) created on the basis of measurements of homogeneous groups of the child population. The level of physical development depends on the values of the main anthropometric features (such as body length and weight, chest circumference, etc.) that determine the overall assessment, as well as their relationship with each other, which determines their harmony, and, in addition, on physiological parameters characterizing the manifestation of vital activity 630 structural components of the body [4,10].

It is known that the same factor can have a heterogeneous effect on the growth and development of children in different regions of the same federal district, in particular, within the same region. In light of this, of particular interest are the current trends in the physical development of children in the metropolis in comparison with the trends in the growth and development of children and adolescents living outside the regional capital. This aspect remains insufficiently studied. In addition, the development of regional standards for physical development remains relevant at



present, since the features (natural-climatic, socio-economic, and others) inherent in individual administrative territories can have a significant impact on the level of development.[5, 6] The physical development of children and adolescents is one of the main indicators of their health. Assessment of the level of physical development at the present time is of paramount importance, since it is largely determined by the socio-economic conditions • and the ecological state of the territory and, in addition, reflects the standard of living of the population In connection with the above, [10.]

Purpose of the study. Determining the characteristics of growth and development of children and adolescents of school age, as well as determining the harmonious development of school children as the initial basis for individual planning of the formation of a healthy lifestyle. The results obtained allow us to substantiate the need to create regional standards for the physical development of children. [11]

Research methods. The anthropometric parameters of 1617 children aged 6-16 years old were measured, of which 617 children studied in secondary educational institutions of the city, 1000 schoolchildren - in the district centers of the region. The obtained values of anthropometric indicators of the physical development of schoolchildren of the city. compared with the results of a study of the corresponding age and sex groups of children and adolescents living in the region. The study of anthropometric parameters was carried out according to generally accepted methods intended for children without chronic diseases . Based on the measurement results, arithmetic mean values (M), mean errors (m), the smallest and largest values (min and max), standard deviations (a) the main anthropometric indicators: body weight and length, chest circumference, waist and hips..[7, 8]

The obtained values of anthropometric indicators of the physical development of schoolchildren of the city were compared with the results of a study of the corresponding age and sex groups of children and adolescents living in the region.

Statistical processing of the research results was carried out using the methods of variation statistics and correlation analysis with the calculation of the criterion

In the course of a comparative analysis, it was revealed that the body length of city boys aged 6-14 years is statistically significantly ($p < 0.01$) lower than that of their peers living in the region. A similar trend was noted among girls of the same age groups. At the same time, in the older age group, the values of the body length of schoolchildren from the city and the region are practically compared.[1, 9]

The body length of boys aged 6 years was 122.9 ± 0.55 cm in the city, and 127.15 ± 0.88 cm in the region ($p < 0.001$); girls — 121.85 ± 0.52 and 125.44 ± 0.87 cm ($p = 0.001$), respectively. At the same time, by the age of 14, the body length of boys in the city was 171.49 ± 1.69 cm, in the region — 171.59 ± 1.06 cm ($p = 0.998$); girls — 163.04 ± 1.62 and 162.95 ± 0.83 cm ($p = 0.953$), respectively (Fig. 1).

When comparing the values of the body weight of schoolchildren in the city and the region, it was revealed that girls begin their education in general educational institutions with almost the same indicators. In boys of the regional capital from the age of 6, and in girls by the age of 8, the body mass indicator becomes significantly

($p < 0.05$) is lower than among peers living in the regional centers of the Samara region. Thus, the body weight of 6-year-old boys in the city was 22.67 ± 0.4 kg, in the region 25.13 ± 0.71 kg ($p = 0.001$); in girls 8 years old — 23.65 ± 0.88 and 29.02 ± 1.18 kg ($p < 0.001$), respectively.



By the age of 14, the body weight of city schoolchildren is practically compared with the corresponding indicator of children in the region. However, at the end of school, at the age of 16, the body mass index of girls in the city is significantly lower than that of peers studying and living in the region. Thus, the body weight of 15-year-old boys in the cities was 65.73 ± 1.57 kg, in the region— 66.95 ± 1.74 kg ($p=0.588$); in girls aged 16 years — 54.28 ± 1.32 and 57.25 ± 0.98 kg ($p < 0.05$), respectively.

Similar differences were revealed in a comparative assessment of the chest circumference. The values of this parameter among urban schoolchildren are significantly lower than among their peers in the region, in the age groups of 6-14 years old for boys and 7-14 years old for girls.

Results. Children of the regional capital and regional centers go to school with almost the same anthropometric parameters. Due to the heterogeneous influence of the conditions and nature of training, nutrition, physical activity, the indicators of physical development in the learning process acquire significant differences. The body length of city boys aged 6-14 years is lower than the body length of peers living in the region ($p < 0.01$). Body weight in girls by the age of 8, and in boys from the age of 7 is less than that of their peers living in the district centers of the region ($p < 0.05$). The chest circumference of the city of schoolchildren is statistically significantly less than that of their peers in the region in the age groups of 6-14 years old for boys and 7-14 years old for girls. The waist circumference of urban boys in the age groups of 6-11 and 13 years, and girls aged 10-14 years is statistically significantly less than that of children in the region. The hip circumference of urban schoolchildren in the primary (6-10 years old) and secondary (11-14 years old) school units is less than in children of the region ($p < 0.05$). Based on the results of the study, the features of the distribution of modern schoolchildren by health groups were determined, showing that the number of absolutely healthy children, i.e. related to the 1st health group, is only 2-5%, having only functional deviations, i.e. Group 2 health within 29-50%, students with chronic diseases group III account for 45.68%. The share of children with the 4th health group is 1-1.5%. Over the past 10 years, the growth rate of functional abnormalities and chronic diseases in schoolchildren has amounted to 40-76% .

Conclusion . The revealed differences in the anthropometric indicators of children in the city and the region demonstrate the need to create regional norms (standards) for assessing the physical development of children and adolescents in large cities and rural areas . Thus, among the surveyed preschoolers, when assessing body length, average parameters were recorded in 46.1% of boys and 39.8% of girls, above and below average - respectively in 12.7 and 8.1% of boys and in 17.1 and 6.3% of girls, high and low - in 9.8 and 0.6% of boys and in 10.2 and 4.4% of girls, very high and very low in 11.0 and 1.7% of boys and in 10.7 and 1.5% of girls. When assessing body weight, the average parameters were registered in 49.2% of boys and in 38.0% of girls, above and below the average - in 13.2 and 8.6% of boys and in 15.2 and 17.6% of girls, high and low - in 4.6 and 6.9% of boys and in 6.9 and 3.9% of girls, very high and very low - in 4.6 and 2.9% of boys and in 4.4 and 3.9% girls.

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