# Some Physical Development Indicators of Primary School-Aged Students in Rural Schools Conditions

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**Annotation:** In the article presents the results of a study of indicators of physical development of rural schoolchildren aged 7-10 years. According to the results obtained, the body weight, height and chest circumference of students increase depending on their age. In particular, in children 7-8 years old, the above indicators do not differ significantly from the norm. Boys and especially girls aged 9-10 years are distinguished by their height, chest circumference and Quetelet index, which are higher than normal.

Studying the physical development of students is one of the important steps in further strengthening their health.

**Keywords:** body weight, height, chest circumference, children of primary school age, height, development.

**Introduction.** It is well known that physical development is one of the main indicators determining the health status of a growing young organism, as well as its growth and development under the influence of various environmental factors. Accordingly, children's lifestyle, nutrition, physical activity, and other factors have a significant impact on the normal processes of growth and development. [4-8]. The peak periods of a child's growth usually occur during infancy, the early school years, and adolescence. Therefore, proper organization of the

child's time at home and at school, strict adherence to a daily routine, regulating mental and physical workloads according to age, and maintaining other similar processes at a physiologically appropriate level play a crucial role in preserving and strengthening children's health. [7-11].

In our Republic, special attention has always been paid, and continues to be paid, by our government to children's health, education and upbringing, their normal growth and development, as well as other related issues. As evidence of this, it is possible to point out a number of approved decrees and resolutions aimed at protecting and strengthening maternal and child health, ensuring proper care from an early age, and creating conditions for children to grow and develop in a healthy and comprehensive manner [1–3].

At the same time, this issue is considered one of the urgent tasks facing physiology and medicine. Studying the morpho functional (anthropometric) indicators of modern schoolchildren primarily serves to safeguard their health and to ensure that they can adequately perform intellectual and physical activities. Today, this issue is one of the pressing tasks not only in our country but also on a global scale.

In particular, the occurrence of non-communicable and nutrition-related diseases among children and adolescents, their prevention, postural disorders, and other related problems are regarded as important scientific and theoretical issues facing physiology and medicine. Specifically, body weight, height, chest circumference, and other indicators are included among the key measures that determine children's normal physical development as well as their socio-economic status [10,11].

**Research Methodology**. During our observations, we attempted to study certain anthropometric indicators of primary school students. The research was conducted among 117 pupils aged 7–10 years (52 boys and 65 girls) studying at several rural schools in Kashkadarya region. The physical development of the students was examined using anthropometric methods [9]. Body weight was measured with a medical scale (PORODO model: PD-BF1321BT-WH, China, 2020), height was determined using a wooden stadiometer (Russia, 2019), and chest circumference was measured with a measuring tape (China, 2019). The obtained data were statistically analyzed using MS Excel and Origin 6.1 software. The arithmetic mean (M), standard error of the mean (m), and standard deviation (SD) were calculated.

**Results and Discussions**. The body weight, height, chest circumference, and certain other somatometric indicators of primary school students are influenced to a considerable extent by their living environment, daily nutrition, mental and physical workloads, as well as the way their daily routine is organized. One of the key indicators used in assessing the normative-physiological condition of children is their physical development, which also serves as an important measure in determining the health status of the younger generation. At the same time, these factors may also contribute to a decline in certain anthropometric parameters and physical development among children.

In this regard, anthropometric indicators such as body height, weight, chest circumference, and body composition provide valuable information in characterizing children's physical development. Therefore, studying and analyzing the morpho functional indicators of younger school-age children is considered one of the pressing tasks.

During the observations, the results of the study of certain anthropometric indicators of 7–10-year-old students—body weight, height, Quetelet index, and chest circumference—are presented in the following table.

As can be seen from the table above, the indicators of students' physical development do not differ significantly from the existing standards. The average body weight of 7-year-old boys is $22.4 \pm 0.74$ kg, their height is $124 \pm 0.02$ cm, and their chest circumference is $62.6 \pm 1.5$ cm. The Quetelet index, instead of the standard 16 kg/m², was found to be $14.48 \pm 0.35$ kg/m², which is

approximately 7–11% lower than the norm. Similar results were also recorded among 8-year-old boys.

**Some Anthropometric Indicators of Primary School Students**

**(n = 117, 2021)**

| Age Groups | Body Weight, kg | | Height, m | | Quetelet Index, kg/m² | | Chest Circumference,cm | |
|---|---|---|---|---|---|---|---|---|
| | M±m | Norm | M±m | Norm | M±m | Norm | M±m | Norm |
| **Boys** | | | | | | | | |
| 7-years (n=6) | 22,4±0,74 | 22,6±0,2 | 124±0,02 | 120±0,4 | 14,48±0,35 | 16 | 62,6±1,50 | 58,6±0,3 |
| 8 years (n=16) | 25,5±0,78 | 25,0±0,3 | 129±0,01 | 125,2±0,3 | 15,22±0,37 | 16 | 65,31±1,16 | 60±0,3 |
| 9 years (n=11) | 31,2±1,50 | 26,3±0,3 | 139±0,01 | 128,1±0,5 | 16,08±0,46 | 17 | 69.36±1,47 | 60,9±0,3 |
| 10 years (n=19) | 34,26±1,55 | 31,1±0,4 | 144±0,01 | 135,6±0,5 | 16,32±0,61 | 17 | 70,36±1,20 | 64,0±0,4 |
| **Girls** | | | | | | | | |
| 7-years (n=5) | 23,3±0,80 | 22,0±0,3 | 126±0,01 | 118,5±0,5 | 14,57±0,57 | 16 | 65,1±0,74 | 56,8±0,3 |
| 8 years (n=16) | 24,3±0,69 | 23,6±0,3 | 130±0,01 | 122,7±0,4 | 14,46±0,33 | 16 | 64,12±0,89 | 58,4±0,3 |
| 9 years (n=25) | 26,16±0,76 | 26,0±0,3 | 135±0,01 | 128,5±0,3 | 14,23±0,36 | 17 | 65,24±0,64 | 59,5±0,3 |
| 10 years (n=19) | 35,5±1,44 | 30,2±0,4 | 146±0,001 | 134,2±0,5 | 16,39±0,59 | 17 | 70±1,22 | 62,0±0,4 |

In 9–10-year-old boys, body weight and height indicators exceed the standard values by approximately 10.2–18.6% and 6.2–8.5%, respectively. The Quetelet index was found to be $16.08 \pm 0.46$ kg/m² in 9-year-olds and $16.32 \pm 0.61$ kg/m² in 10-year-olds, which is on average 4.5–5.5% lower compared to the standard value of 17 kg/m². From this, it can be observed that in boys aged 7–10, body weight and height indicators increase with age. This can be explained by physiological and biochemical processes occurring in their bodies, as well as environmental conditions, lifestyle, and other influencing factors.

In girls aged 7–10, body weight, height, Quetelet index, and chest circumference indicators also differ to varying degrees from the recommended standards. Specifically, the average body weight of 7-year-old girls was $23.3 \pm 0.80$ kg compared to the standard $22.0 \pm 0.3$ kg, while their average height was $126 \pm 0.01$ cm instead of the standard $118.5 \pm 0.5$ cm. The Quetelet index was $14.57 \pm 0.57$ kg/m², which is 6.3–9.1% higher than the norm. Chest circumference exceeded the standard by an average of 14.6%.

Among 8-year-old girls, the average body weight and height were $24.3 \pm 0.69$ kg and $130 \pm 0.01$ cm, respectively. While body weight did not differ significantly from the standard, height was on average 5–10% higher. A similar tendency was observed in the Quetelet index.

In 9-year-old girls, body weight showed no notable difference from standard values, but height exceeded the norm by 4.7–6.5 cm. However, the Quetelet index averaged $14.23 \pm 0.36$ kg/m², corresponding to about 83.7% of the standard. Chest circumference was, on average, 9.6% (5.7 cm) greater than the norm, as clearly seen in the table above.

In 10-year-old girls, body weight averaged $35.5 \pm 1.44$ kg compared to the standard $30.2 \pm 0.4$ kg, while height was $146 \pm 0.001$ cm instead of $134.2 \pm 0.5$ cm. This indicates that the growth rates of body weight and height in girls of this age group are markedly higher compared to other age groups and existing standards. Similarly, chest circumference was 8.3–12.9% greater than the norm. Such results can be explained by the influence of prepubertal and pubertal periods in children's lives, associated with changes in somatic and psychophysiological processes occurring

in their bodies.

**Conclusion and Recommendations**. In conclusion, it can be stated that some indicators of students' physical development—body weight, height, Quetelet index, and chest circumference—do not fully correspond to the existing standards. In particular, among 7–8-year-old children, these indicators do not show significant differences compared to the norms. However, in 9–10-year-old boys and especially girls, height, chest circumference, and Quetelet index are noticeably higher than the standard values.

This situation can be explained by the prepubertal stage in children's lives, the extent of mental and physical workloads they undertake, the way daily routines are organized both at home and at school, as well as other influencing factors. Continuous monitoring of students' physical development is considered one of the important steps in further strengthening their health.

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