## Analysis of Indicators of Physical Development of 7-11 Year Old Girls under the Influence of Anthropogenic Loads

Nargiza B Kdirbaeva, Aynura B Kazieva, Aygul K Jumabaeva, Firdavs Sh Xasanov\*, Sanjar S Soxibov\*

Karakalpak State University named after Berdakh, Department of General Biology and Physiology, Nukus, Republic of Uzbekistan

\*Samarkand Institute of Veterinary Medicine, Faculty of Veterinary Prevention and Treatment, Samarkand, Republic of Uzbekistan

**Annotation.** The physical development of the child population depends on the environment and is one of the informative criteria of health. In this work, an attempt was made to analyze the somatometric indicators of girls of primary school age and to identify the features of physical development characteristic of the studied territory.

Keywords: physical development, body weight, Aral Sea region, ecological status, anthropogenic pollution, pollutants, toxic substances

**Introduction.** Physical development is an integral indicator that determines the state of health of a growing young organism [5, 7]. The physical development of children is one of the main criteria for their health. The growth and development of a child's body will largely depend on genetic and environmental factors (for example, pollution of the environment with chemicals for many years). In the Southern Aral Sea region, atmospheric air pollution (dust and salt storms), severe salinization of soils and drinking water, desertification of most of the territory of the region, the residual content of pesticides in the environment (water, soil, air, food) negatively affected the health of the population [15]. Therefore, it is necessary to monitor the health of the population. The study of the patterns of physical development of children and adolescents living in the Aral Sea region is relevant due to the unfavorable environmental situation in this region [11].

The purpose of this work is to study the level of physical development of primary school-age girls living in the Republic of Karakalpakstan (Southern Aral Sea region).

Materials and methods: in the course of our study conducted in 2021 at the general education school №38 in the city of Nukus of the Republic of Karakalpakstan, an somatometric survey of 96 girls of different ages (7-11 years) was conducted. Among them: 17 - 7-year-olds, 18 - 8-year-olds, 20 - 9-year-olds, 21 - 10-year-olds and 20 - 11-year-old girls. The ethnic composition of girls of all ages surveyed was as follows: 70.18% Karakalpaks, 25.46% Kazakhs and 4.36% Uzbeks.

The following parameters of body structure were determined by the generally accepted method: 1. Body weight was measured on electronic medical scales with a measuring accuracy of up to 100 g, depending on the weight. 2. The height was evaluated using the height meter MM 045 with a measurement accuracy of up to 5 mm. 3. The circumference of the chest was measured by means of anthropometric tape.

**Results and their discussion.** Indicators of height and body weight - serve as the basis for assessing the level of physical development of the child population and the essential features of its morphofunctional state throughout life [4].

Body length is the main sign of heredity in children and indicates the speed of growth processes, is the most stable indicator characterizing the state of plastic processes in the body [14]. In children of primary school age, height is one of the most important criteria of somatic maturity and is the basis for the correct assessment of body weight and chest circumference. Body weight reflects the degree of development of skeletal and muscular systems (internal organs, subcutaneous fat) and changes rapidly under the influence of exogenous factors. The chest circumference index characterizes the volume of the body, the development of the muscles of the chest and back, as well as the functional state of the organs of the thoracic cavity [6, 8].

According to the analysis of the results obtained, with increasing age in the studied groups of children, the length of growth also increases. In the transition interval from 7 to 8 years, the growth of girls  $(124.7 \pm 1.03 \text{ and } 130.4 \pm 1.47 \text{ cm}, \text{ respectively})$  reached the highest level (+5.7 cm), and in the transition interval from 10 to 11 years  $(135.2 \pm 1.32 \text{ and } 142.8 \pm 2.07 \text{ cm}, \text{ respectively})$  - the highest level (+7.6 cm). In the interval from 9 to 10 years, the growth of girls remained almost unchanged (Table 1).

International Journal of Academic Health and Medical Research (IJAHMR) ISSN: 2643-9824 Vol. 5 Issue 12, December - 2021, Pages:26-29

Indicators	7 years (M±m)	8 years (M±m)	9 years (M±m)	10 years (M±m)	11 years (M±m)
Height length, cm	124,7±1,03	130,4±1,47	134,4±1,36	135,2±1,32	142,8±2,07
Body weight, kg	24,6±1,21	26,6±1,30	30,6±1,94	30,4±1,40	34,5±1,72
Chest circumference, cm	60,7±1,29	64,2±1,66	65,2±2,03	66,3±1,23	69,9±1,43

The same situation was observed with body weight, i.e. in the interval between the transition from 8 to 9 years and from 10 to 11 years, body weight  $(26.6\pm1.30 - 30.6\pm1.94 \text{ kg} \text{ and } 30.4\pm1.40 - 34.5\pm1.72 \text{ kg}$ , respectively) increased by +4 kg. At the age of 7-8 years, body weight  $(124.7 \pm 1.03 \text{ and } 130.4 \pm 1.47 \text{ cm}$ , respectively) increased by +2 kg. However, no changes in body weight were observed at the age of 9-10 years (Fig. 1).

The following results were obtained along the chest circumference, i.e. an increase of +3.5 cm in the transition interval from 7 to 8 years and from 10 to 11 years ( $60.7 \pm 1.29 - 64.2 \pm 1.66$  cm and  $66.3 \pm 1.23 - 69.9 \pm 1.43$  cm, respectively). In other age periods, the height was +1 cm.



Figure 1. Variations in height and body weight in girls of different ages

In the 60s of the XX century, as a result of a sharp reduction in the amount of water discharged into the Aral Sea, an unfavorable ecological crisis arose in the territory. The disturbance of the water balance in the region also affected the composition and quality of drinking water. Drinking water is one of the environmental factors that has a complex anthropogenic impact on the human body. The quality of underground and surface water sources in the habitat is one of the important characteristics of health. Drinking water can also be a source of toxic substances that enter the human body. For example, chlorination is widely used in most countries to purify drinking water from bacteria and microorganisms in general. Organochlorine compounds are formed during the chlorination of drinking water in water supply facilities. In the process of chlorination of tap water, the composition of drinking water includes not only chlorine, but also other organochlorine compounds (chloroform, carbon tetrachloride, 1,2-dichloroethane, etc.), which have high toxic properties and have a negative impact on human health.) also falls [1]. In general, water pollutants include: acids and alkalis, household waste, fertilizers, food residues, various gases, heavy metals, organic toxic waste, pathogenic microorganisms and pesticides. The dirty substances contained in the water not only remain in the water, but also get into the soil

## International Journal of Academic Health and Medical Research (IJAHMR) ISSN: 2643-9824 Vol. 5 Issue 12, December - 2021, Pages:26-29

## and get into plants, vegetables and fruits through the soil. Animals also drink this polluted water, and harmful waste gets into the animals' body. The above circumstances have a negative impact on the sustainability of food products [12].

According to research, excessive amounts of Cl and Na, insufficient amounts of Ca and Mg were found in the hair follicles of children aged 3 to 16 years living in the Republic of Karakalpakstan [9]. This led to negative changes in the functional characteristics of the cardiovascular system in children. In another study, the presence of correlations between diseases (mental disorders, diseases of the digestive system, diseases of the urinary organs) with microelements harmful to human health contained in drinking water was established [3].

Atmospheric air occupies a leading place in the intake of toxic substances into the human body. Polluted air primarily damages the lungs. Inhalation of such air (SO<sub>2</sub>, NO) leads to acute and chronic respiratory diseases. The author [5] believes that the anthropometric indicators of physical development of children depend on the degree of chemical pollution of the atmospheric air of their place of residence. This relationship has sex differences. That is, boys living in an area with polluted atmospheric air had a decrease in all anthropometric indicators of physical development, and girls had a decrease in body weight and chest circumference. Living in areas with high air pollution leads to asthenization of the structure of the girl's body.

In addition, the increased content of heavy metals (Pb, Hg, Cu, Al, Cd, etc.) in the environment is also extremely dangerous. Pb has a toxic effect on the female and child's body, including disrupts the reproductive function in women, leads to the development of various pathological conditions during pregnancy. There are cases of premature birth, disorders in the health of the fetus and the newborn baby. According to the conducted studies, it was found that there are negative correlations between the growth of Pb and anthropometric indicators in the blood of schoolchildren and, in particular, the growth of [10], as well as the length of legs and arms [13].

The Southern Aral Sea region is based on agriculture, and cotton is grown in many areas of the region. In order to obtain high yields from cotton fields and protect other crops from pests, chemical agents and pesticides were used. The high use of pesticides in agriculture leads to contamination of soil, reservoirs, vegetation and eventually gets into the body of animals and humans. It has been established that the alimentary (nutritious) way is the entry into the human body of persistent pesticides from the environment in 95% of cases through food, in 4.7% - through water and in 0.3% - with atmospheric air through the respiratory tract and in very small quantities through the skin [2].

The consequences of anthropogenic pollution may be asymptomatic, but they affect the early onset of the aging process and a reduction in human life expectancy. These effects lead not only to a slowdown in the growth and development of the body, but also to the occurrence of diseases such as nephritis, inflammatory diseases of the stomach and duodenum, bronchial asthma, cholelithiasis, chronic bronchitis, coronary heart disease, hypertension, anemia, skin diseases and diseases of the digestive system, sometimes oncological diseases, cervical erosion in women.

**Conclusion.** The development of anthropometric standards typical for the region in the Aral Sea region is one of the urgent tasks today. In this paper, an attempt was made to analyze the somatometric indicators of primary school-age girls. Of the main somatometric indicators, the height of girls aged 7 to 11 years was 18.1 cm (from 124.7 to 142.8 cm), body weight-9.9 kg (from 24.6 kg to 34.5 kg), and chest circumference - 9.2 cm (from 60.7 to 69.9 cm).

## **References:**

1. Akayzina A.E. Znachenie integral`nix pokazateley oksidantnogo statusa i letuchix jirnix kislot dlya otsenki vliyaniya xlororganicheskix soedineniy pit`evoy vodi na organizm detey. Avtoref. dis. ... kand. med. nauk. Ivanovo, 2014. (InRuss).

2. Bondarenko L.V. Bezopasnost` jiznedeyatel`nosti: uchebnoe posobie / L.V. Bondarenko. – M.: REU im. G.V. Plexanova, 2008. – 230 s. (InRuss).

3. Danilova Ye.A., Osinskaya N.S., Xusniddinova S.X., Axmedov Ya.A. Elementniy sostav volos - indikator prirodnotexnogennoy obstanovki Tashkentskoy oblasti. Mikroelementi v meditsine, 2020. 21(3): 23-33. DOI:10.19112/2413-6174-2020-21-3-23-33 (InRuss).

4. Fedotova T.K. O spetsifike formirovaniya somaticheskogo statusa detey ot 7 do 16 let. Pediatriya. – 2005. – № 5. – S. 92–94. (InRuss).

5. Kotisheva Ye.N., Dzyundzya N.A., Bolotskaya M.Yu. Analiz antropometricheskix pokazateley fizicheskogo razvitiya detey 5–7 let v usloviyax promishlennogo goroda. Pediatriya. – 2008. – Tom 87. – №2. – C. 140-143. (InRuss).

6. Litovchenko O.G., Solov`ev V.S. Total`nie razmeri tela urojentsev Srednego Priob`ya v vozraste 7–20 let. Ekologiya cheloveka. – 2007. – №8. – S. 27-29. (InRuss).

7. Mixaylova L.A., Chesnokova L.L., Mal`tseva Ye.A. Antropometricheskie pokazateli detey prepubertatnogo vozrasta promishlennogo goroda. Sovremennie problemi nauki i obrazovaniya. – 2016. –  $\mathbb{N}$  6.; URL: <u>https://science-education.ru/ru/article/view?id=25473</u> (InRuss).

8. Rozumbetov, K. U., & Dauletov, R. K. (2020). Osobennosti vozrastnoy izmenchivosti nekotorix morfofiziologicheskix priznakov u detey, projivayushix v Respublike Karakalpakstan. Forum molodix uchenix, (10), 567-571. (InRuss).

9. Akhmedova, D., Matkarimova, A., Akhmedova, N., & Zhiemuratova, G. (2018). Factors and criteria for predicting cardiovascular diseases in children living in the conditions of the Aral ecological zone. *Bulletin of Science and Practice*, 4, (1), 43-49

10. Ignasiak Z, S[swsl]lawin ´ska T, Rozek K, Little BB, Malina RM. 2006. Lead and growth status of school children living in the copper basin of southwestern Poland: differential effects on bone growth. Ann Hum Biol 33:401–414.

11. Erkudov, V.O., Pugovkin, A.P., Rozumbetov, K.U., Matchanov, A.T., Esimbetov, A.T., & Dauletov, R.K. Ethnic diversity in physical development of youngsters living in the aral sea region. *ILMIY XABARNOMA*, 71.

12. Ihunwo, Confidence Chidera (2021). Exploring the Importance and Impact of Quality Water on Human Health. International Journal of Academic Health and Medical Research (IJAHMR), 5(10), 90-96.

13. Min KB, Min JY, Cho SI, Kim R, Kim H, Paek D. 2008. Relationship between low blood lead levels and growth in children of white-collar civil servants in Korea. Int J Hyg Environ Health 211:82–87.

14. Rozumbetov, K.U.U., Utemuratov, N.A., & Matchanov, A.T. (2020). Characteristics of somatometric indicators of boys 7-11 years. In Охрана и рациональное использование природных ресурсов Южного Приаралья (pp. 339-341).

15. Yerkudov V.O., Zaslavsky D.V., Pugovkin A.P., Matchanov A.T., Rozumbetov K.U., Dauletov R.K., Esemuratova S.P., Nazhimov I.I.,

Puzyrev V.G. Anthropometric Characteristics of Young Adults in Areas with Different Ecological Risks in the Aral Sea Region, Uzbekistan.

Ekologiya cheloveka [Human Ecology]. 2020, 10, pp. 45-54.