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ASSESSMENT OF THE PHYSICAL DEVELOPMENT OF YOUNG SCHOOL AGE CHILDREN OF ARAL REGION

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Abstract

We examined 240 children aged 7-10 years living in the Khorezm region. The selection of children was carried out by the method of continuous random non-repetitive sampling. For the examination of children, the following methods were used: clinical and anamnestic, assessment of external minor anomalies of development, interviewing parents, analysis of data from primary medical documents. The survey included an anthropometric study: measurements with determination of body weight, length / height, weight-height index.

Analyzing the above data, we came to the conclusion that physical development is a dynamic process that characterizes the processes of growth and development of a child at the present time, which are considered as one of the main and informative criteria for the health of the child population.

Keywords: children, health, preschool age, the Aral Sea region, physical development.

抽象的

我们检查了生活在 Khorezm 地区的 240 名 7-10 岁的儿童。儿童的选择采用连续随机非重复抽样的方法进行。对于儿童的检查，使用了以下方法：临床和回忆、评估外部轻微发育异常、采访父母、分析原始医疗文件的数据。该调查包括一项人体测量研究：测量体重、身长/身高、体重-身高指数。

分析上述数据，我们得出的结论是，身体发育是一个动态过程，表征了当前儿童生长发育的过程，被认为是儿童健康的主要和信息标准之一。人口。

关键词：儿童，健康，学龄前年龄，咸海地区，身体发育。

Introduction

The consequences of the Aral Sea crisis for the Central Asian states are defined by international experts as a global ecological catastrophe of the

XXI century [1]. Formerly the fourth largest lake in the world, the Aral Sea is now a far from inspiring sight. Since the 1960s of the last century, the sea level has been decreasing due to

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the continuous increase in water intake from the main feeding rivers of the Amu Darya and Syr Darya. At the 72nd session-2018 of the General Assembly of the United Nations (UN), the President of the Republic of Uzbekistan Sh.M. Mirziyoyev drew the attention of the international community to one of the most acute environmental problems of our time - the drying up of the Aral Sea and called for an active consolidation of international efforts to overcome its consequences. Human ecology is in dire need of criteria and methods to assess not a distant, but a direct effect of the impact of unfavorable environmental conditions on the body [7,8,12,13]. Here it is necessary to pay attention to the preclinical stages of diseases, to changes in the functional state. According to R.M. Baevsky's response to the impact of various environmental factors contains two components - specific and nonspecific. A specific component is the defeat of certain organs and systems of the body, which appear as a separate nosological form. But in the beginning, in response to any impact, a nonspecific component always develops, the so-called general adaptation syndrome. Leading here is the mechanism for mobilizing reserves, which ensures the protection of the body and its stability. Only as a result of the depletion of the body's defenses, a decrease in its adaptive capabilities, irreversible changes in organs and systems develop, and diseases appear [8]. By now, numerous data have been accumulated that significant pollution of the atmosphere, soil, water, as well as harmful factors of industrial production of varying intensity lead to disruption of the normal development of a growing organism [6,9,10]. Physical development is rightfully considered one of the most important criteria reflecting the state of health of the child population. The data obtained during

anthropometric examinations of homogeneous groups of children, when summing up the results, can serve as the basis for population monitoring in a specific territory [1]. Assessment of the level of health at the present stage is impossible without taking into account regional characteristics, reflecting the diversity of the ethnic composition of the population, the characteristics of the way of life, and climatic conditions.

When analyzing outpatient outpatient maps of the history of a child's development, attention is drawn to the ignorance of the assessment of anthropometric data. However, often a deviation from the norm of physical development is the first important symptom of both a functional state and an existing disease. Physical development along with fertility, morbidity and mortality is one of the indicators of the level of health of the population. A child's body, unlike an adult's body, reacts to the effects of the external environment - biological and social - in an especially sharp degree (Akhmedova D.I. et al., 2006, Yuryev V.V. et al., 2007). The age dynamics of growth and body weight in children - residents of the arid zone of ecological disaster reflects the general, so-called, nonspecific signs of the development of the organism in a changing natural environment [4,6,14,16]. It should be noted that anthropometric characteristics depend not only on the ecology of the environment, but also on lifestyle, nutrition, individual characteristics of the organism and other factors. At the same time, at this stage of the development of the issue, the characteristic of anthropometric indicators can be one of the main, simplest and most reliable criteria characterizing the negative influence of environmental factors on a growing organism [1, 10, 19]. Physical development is understood as a dynamic process of changes in the

morphological and functional characteristics of the body (changes in body size, proportions, physique, muscle growth, performance), caused by hereditary factors and specific environmental conditions [1,2,3,18]. As a result, the growth rate of children and adolescents can undergo significant changes. Growth and development processes are the main characteristics of childhood. Studying the patterns of development, creating methods for its practical control, protecting and ensuring the normal development or, more precisely, the optimal development of children is one of the main components of both pediatric science and the practical activity of a pediatrician [4,5,6]. The physical development and health of children in this region is largely influenced by environmental problems, since the relationship between soil, water and air plays a major role in human life.

In connection with the above, the purpose of the study was to study the physical development of children of primary school age living in the Aral Sea region (Khorezm region - Urgench city and districts of the region).

Materials And Methods

We examined 240 children aged 7-10 years living in the Khorezm region. The selection of children was carried out by the method of continuous random non-repetitive sampling. For the examination of children, the following methods were used: clinical and anamnestic, assessment of external minor anomalies of development, interviewing parents, analysis of data from primary medical documents. The survey included an anthropometric study: measurements with determination of body weight, length / height, weight-height index. The monitoring and evaluation of the growth and development of children was carried out on the

basis of the child growth standards published and recommended by the World Health Organization and UNICEF (2013), using curves of body weight versus age, length / height versus age, weight versus length / height (mass-growth index). Statistical processing of the obtained results was carried out using the application programs for statistical data processing Statistica® version 6.0. The significance of differences between the compared groups was assessed according to Student's criteria. Differences between the compared values were considered statistically significant at $p < 0.05$.

Results And Discussion

When assessing the physical development of children aged 7-10 years living in the Aral Sea region, a difference in their physical development was revealed. It is important to assess not only the region of residence, but also the type of settlement (city, village). Thus, the body weight of children in most of the northern part of our republic, as well as their height, is generally below the standard average. At the same time, the relatively small height of children and adults is not at all a risk factor for health, their physical development. Assessment of the physical development of a child in the process of his growth is extremely necessary when providing medical care to children of different ages. Many structural and functional components of growth and development are invisible in general growth patterns, but they take on their meaning in assessing clinical problems. The next characteristic of physical development is the rate of physical development. Its definition is necessary for a qualitative assessment of the health status of each individual child. The individual diversity of the rates of physical development is large enough, but if it fits within the boundaries of the norm, it means that the

conditions of life and activity of the child correspond to the capabilities and needs of his body. This is due to the different rates of tissue growth. According to the dynamics of the growth and development of children, one can judge their health, physical and mental well-being. Any deviations from the norm in physical development indicate a relative disadvantage in health and should be taken into account. At the same time, it is customary to take into account and evaluate the peculiarities of growth and development, primarily by indicators of physical development. Growth indicators are also differentiated depending on gender and age. According to our research, the pace of physical development in the city in girls of 7-8 years old showed an advance in weight gain, and the increase in height slowed down during the year, and the boys showed normal weight, but a slowdown in growth was noted. Girls 9-10 years old showed normal weight and gain in height, while boys showed normal weight and an advance in height. A significant difference in physical development in rural girls of 7-8 years old was observed to gain weight normally and the increase in height slowed down during the year, and in boys there was a slowdown in weight and height. Girls 9-10 years old showed a slowdown in weight and growth ahead, and boys showed normal weight and gain in height. Our studies have shown that at the age of 10, boys slightly outnumbered girls. This is the age of one of the “crossovers”. It is known that between 7 and 8 years old boys are about a centimeter taller than girls, and in the interval of 10-13 years, due to the puberty lead, girls are taller than boys. These indicators of physical development are presented in Tab 1.

Table 1. Indicators of body weight and height in children of primary school age

Place of living	Age (years)	
	7-8	9-10
WEIGHT (KG)		
Boys		
Town	24,29±1,34	29,75±0,69
Village	20,95±0,50	26,97±0,55
Girls		
Town	25,23±1,34	27,63±0,82
Village	21,48±0,49	26,30±0,95
HEIGHT (CM)		
Boys		
Town	121,00±1,63	129,58±1,37
Village	118,48±1,06	129,74±1,00
Girls		
Town	115,08±4,69	125,01±2,67
Village	120,31±1,22	129,44±1,36

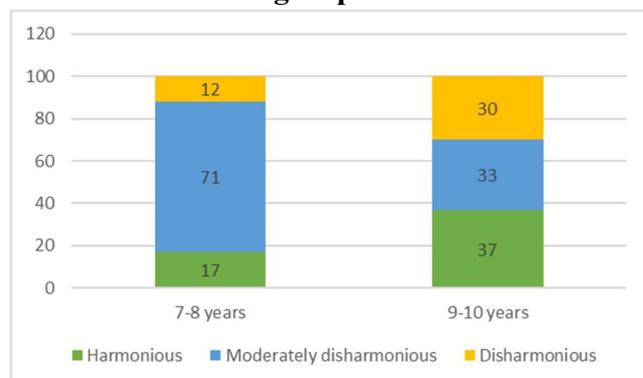
* $p < 0.001$ when comparing indicators with the first and previous measurements

The data indicate that children with a length above the norm relatively rarely have a normal weight for their body length - more often they have an excess or, conversely, a deficit in weight. Children with a length below the norm almost always have a body weight normal for their length.

With a more in-depth examination of the physical development of children, we divided them into two age groups: 7-8 years old and 9-10 years old. The formation of groups is based on such criteria as anatomical and physiological characteristics of the organism, social load, the degree of adaptation to environmental conditions. The assessment of harmony and pace of physical development was carried out. In all age groups, a harmonious type of physical development was revealed in 56.7% of all examined children, with a significant predominance of girls (61.6% and 38.4%, respectively, $p < 0.001$). Disharmonious and

moderately disharmonious types of physical development prevailed in boys ($p < 0.001$). The distribution of children by types of harmony of physical development by age groups is shown in Figure 1.

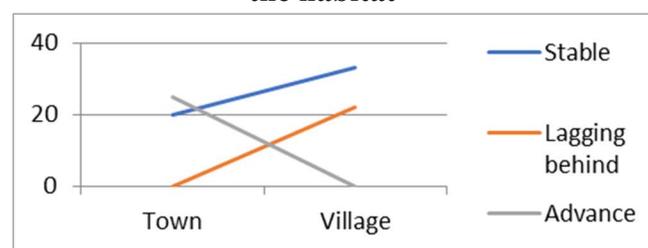
Figure 1. Distribution of children by types of harmony of physical development by age groups



The diagram shows that the harmonious development of 7-8 years -17%, moderately disharmonious-71%, disharmonious-12%. 9-10 years of harmonious development-37%, moderately disharmonious-33%, disharmonious-30%. When analyzing the indicators of physical development and assessing physical development, the following distribution of the rates of physical development was revealed, 55% of all examined children were at a stable rate of physical development, 27% of cases - a lagging rate of physical development, 18% - an outstripping rate of physical development. The number of children in this group was 20% of the total number of those surveyed, with a predominance of boys ($p < 0.001$). In the group of children with a harmonious type of development, a stable rate of physical development prevailed. The number of children with an outstripping rate, both among boys and girls, increased from the younger to the middle age group, and then significantly decreased in the older age group. A

lagging and stable rate of physical development prevailed in boys ($p < 0.001$), and an outstripping rate dominated in girls ($p < 0.001$). In our study, urban children with a stable rate of physical development accounted for -20.0%, a lagging rate of physical development was not revealed in terms of gender differences, an outstripping rate of physical development was -25%, and in rural children a stable rate of physical development was -33.0%, lagging behind the rate of physical development was 22%, the outstripping rate of physical development was not revealed.

Figure 2. Physical development depending on the habitat



It follows from diagram 2, the ratio of urban and rural contingent, revealed that the number of children with a stable rate of physical development is greater in rural areas than in urban areas. In children of the urban contingent, the outstripping pace of physical development has its place, but in rural areas it has not been revealed. Overweight children are most common among 10-year-old boys (11%) and 9-year-old girls (14.3%). In general, the disharmony of physical development in boys and girls before the onset of puberty is mainly determined by a delay in growth processes and, accordingly, overweight, and after its completion, by tallness, deficiency and excess body weight. Unfortunately, the process of physical development of children at school is practically not controlled. The rates of annual growth in length and body weight are not analyzed, the biological age of schoolchildren is not assessed,

consultations by an endocrinologist are occasional due to sharp deviations in height and weight indicators from the norm, and the processes of growth and development of schoolchildren are not corrected in accordance with regional standards.

Conclusion

Analyzing the above data, we came to the conclusion that physical development is a dynamic process that characterizes the processes of growth and development of a child at the present time, which are considered as one of the main and informative criteria for the health of the child population. These indicators are the leading criterion of the health status of the younger generation and require systematic monitoring, including in the field of social and hygienic monitoring. Thus, the children of the urban population are considered harmoniously developed, which is 20%, and rural children are only 33%. Disharmony in the physical development of schoolchildren in the Aral Sea region, urban children -80%, and rural children 67% more depends on their height than on their weight (14.1% and 10.7%, respectively). A high percentage of disharmoniously developed boys is noted at the age of 7 and 10 (27.4 and 29.6%, respectively), and disharmoniously developed girls - at 7 and 9 years (about 30%), which corresponds to periods of active growth and development of their organism. It is important to note that physical development obeys biological laws and reflects the general laws of growth and development of the body. The assessment of physical development is based on a comparison of individual indicators with the average value of the accepted standards for a given group. The presence of deviations in physical development and biological maturation in a child is an absolute indication for registering him in dispensary

records. With the prospect of further research, it is necessary to monitor the physical health of all age categories of the child population and create health-improving technologies for children and adolescents in the Aral Sea region, taking into account the ecological situation.

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