

Comparative Assessment of Health and Physical Development Indicators Of 15–16-Year-Old Boys Studying in Different Regions of Uzbekistan

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Abstract: A comparative assessment of the health and physical development indicators of 15-16-year-old boys studying in various regions of Uzbekistan was conducted using anthropometry methods and functional tests. Analysis of the Kettle weight-height index indicators shows that no differences were found in the physical development of Russian and Uzbek schoolchildren. The obtained results can be used in designing training program content. The results of functional indices indicate an average level of health development among schoolchildren in the studied regions, excluding the health indicators of Urgench schoolchildren attending a school with a sports orientation.

Keywords: Health, physical development, functional indices, schoolchildren, regions of Uzbekistan, monitoring.

Introduction: This study addresses the objectives set forth in the Decree of the President of the Republic of Uzbekistan dated March 5, 2019, which puts forward five key initiatives, including a special focus on engaging young people in physical education and sports. A priority objective of Uzbekistan's socioeconomic development is protecting and improving the health of people of all ages and engaging them in physical education and sports. Thanks to the initiative of President Shavkat Mirziyoyev, special attention is being paid to the health of the younger generation, and large-scale health promotion activities are being implemented for children and adolescents. In Uzbekistan, the issue of physical education, rather than developmental, is becoming more pressing. This necessitates the development of modern information technologies based on health research for the younger generation.

Level of research: In recent years, amidst challenging socioeconomic conditions, many countries around the

world have raised alarm about the deteriorating demographic situation. The World Health Organization (WHO) has identified the prevention of health problems, including obesity in children and adolescents, as one of its key priorities for the 21st century. Physical behavior plays a key role in this. Persistent negative shifts in the health of children and adolescents have been identified. However, to date, no uniform periodization has been established for the development of physical fitness, somatic, and functional indicators for adolescent schoolchildren. Health is still viewed as a stable state, in which all morpho-functional systems clearly perform all functions in strict accordance with certain patterns, allowing them to be characterized using mathematical statistics. Developing criteria for general physical development and functional fitness in adolescent schoolchildren living in various regions of the republic is becoming a pressing issue.

Objective of the study: Comparative assessment of physical development and health level of adolescent

schoolchildren, taking into account the region of residence. The study subjects were schoolchildren aged 15-16 years studying in the urban areas of Karshi, Urgench, and Chirchik, as well as in rural areas (the village of Nekuz). The survey was conducted based on the recommendations outlined by D.D. Safarova. A total of 144 schoolchildren were examined. The results obtained were processed using mathematical statistics methods.

METHODS

Total body dimensions were measured using anthropometric methods, with the Quetelet index, which characterizes weight-height ratio, calculated. Functional research methods using specialized formulas were used to calculate the Vital Index (VI), which characterizes aerobic capacity; the Robinson Index (which characterizes cardiovascular function); and the Strength Index (SI), which reflects the strength of the right and left arms. Experience shows that this problem can be solved using transdisciplinary approaches. Radical changes are needed in health maintenance and promotion strategies, as well as in the search for technologically advanced diagnostics of the morpho-functional and physical fitness levels of adolescent schoolchildren. In assessing the physical development of adolescent schoolchildren, our study primarily analyzed total and partial body measurements. Body length and weight are traits that fully reflect the genetic, hormonal, and physiological patterns of a growing organism. The relationship between body weight and length is so close that knowing body weight can predict strength. Chest circumference is also an indicator of vital capacity, indicating the capabilities of the respiratory system [6, 7]. To evaluate these indicators,

statistical information on these traits was analyzed. According to WHO, physical development of children aged 12-14 in 2001-2012 was characterized as follows: body length at 12 years - 149.1 cm; at 13 years - 156.0 cm; at 14 years - 163.2 cm. According to statistical data in the Russian Federation, the same indicators for boys are: at 12 years - 148.99 cm; at 13 years - 155.2 cm; at 14 years - 161.5 cm. The average BMI values, according to WHO, were: at 12 years - 16.9; 13 years - 18.2; at 14 years - 19.00. In the Russian Federation, the indicators were as follows: at 12 years - 17.6; at 13 years - 18.2; at 14 years - 18.66 [4]. We studied teenagers aged 15-16 years. In comparison with the above data, no significant differences were found in the physical development of teenagers studying in schools in Uzbekistan. The data we presented from our analysis of weight-height parameters, in particular the Quetelet index, can be used to design training programs that take into account the morphological and physiological development of adolescents. Differences were identified during the examination between schoolchildren who do not participate in sports and those who participate in handball and football sections. This was typical for schoolchildren from Urgench, who differed not only in their physical development but also in their physical health. To study the capabilities of the respiratory system, we used tests to determine vital capacity, which was used to calculate the vital index (VI). The results of hand dynamometry in schoolchildren indicate that the right hand has the greatest muscle strength; due to hereditary asymmetry, the indicators for the left hand differ slightly, being characterized by lower values. It should be noted that the highest indicator of hand strength was demonstrated by schoolchildren from Urgench compared with other

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No	Physical development indicators - 15-16 years	Karshi School No. 23	Village Nekuz. School No. 44	Urgench School No. 19 and others	Chirchik school number 13	Assessment of physical development of schoolchildren in Uzbekistan	P-reliability
1	Body length (cm)	171,9 ± 6,7	170,5 ± 8,16	175,3 ± 5,29	170,5 ± 7,14	172,05 ± 6,82	<0,05
2	Body weight (kg)	58,9 ± 9,2	56,9 ± 9,05	65,1 ± 8,1	56,5 ± 8,36	59,8 ± 8,68	<0,05

3	Chest circumference (cm)	86,9±9.2	82,7±6,05	84,6±4,851	79,8±5,71	83,5±6,45	<0,05
4	Quetelet index	21,3±2,9	19,7± 3,01	21±1,91	20,7±1.9	20,7±2,43	<0,05
5	ZHI – vital. Index	44,3±7,1 Below average	50,5±7,08 Average	67,98±7,21 High	54,7±10,2 Above average.	54,4±7,89 Above average.	<0,05
6	IR – index Robinson	120,5±17,7 Short	112,3±14,53 Short	121,3±20,06 Short	105±11,2 Below avg.	114,8±15,87 Short	<0,05
7	DK - left hand	18,8±2,8	21,8±6,24	37,1±5,8	14,6±3,68	26,1±4,63	<0,05
8	DK - right hand	22,08±3,9	24,8±,2,9	40,7±6,5	24,7±3,63	28,1±4,23	<0,05
9	Strength index	40,38±4,17 Below average.	46±9,49 Below average..	65,03±10,23 High	43,7±7,63 Below average	48,8±7,88 Below average	<0,05

schoolchildren not involved in sports from the city of Karshi, the village of Nekuz, and the city of Chirchik. Consequently, an excellent strength index was demonstrated by 15-16 year old schoolchildren from Urgench, amounting to 65.03 ± 10.23 kg, assessed according to the Apanasenko G.L. scale. As "high", that is, a score of 61 conventional units and above is considered an excellent indicator. For 16-year-old schoolchildren from Urgench, the DK - right hand - 40.7 ± 6.5 kg, left hand - 37.1 ± 5.8 kg, the calculated strength index was - 65.03 ± 10.23 , assessed as "high", which indicates an increase in the level of training. Analyzing the Robertson Index, which characterizes the overall health of the cardiovascular system, it should be noted that across all age groups of schoolchildren, cardiovascular function is rated as "low" or "below average." Consequently, the Robertson Index is a weak link among other indices characterizing the health of schoolchildren. This requires the organization and implementation of corrective work through physical education and the development of specialized health exercises. The table below highlights the most significant indicators characterizing the level of development in a comparative perspective for schoolchildren in the specified geographic regions. However, given that during adolescence there is an intensive but uneven development of the functional systems of the body of adolescents living in different regions of Uzbekistan, it is necessary to specify the

determinants of the development of adolescent schoolchildren.

Recommendations

Improving the health of the younger generation is only possible through the implementation of measures aimed at identifying early criteria for assessing physical activity and systematically developing programs to improve physical fitness based on a combination of physical education and internationally recognized sports. In addressing this issue, the creation of a system for monitoring the health of children and adolescents in various regions of Uzbekistan plays an important role in making timely decisions on preventive and health-improving measures.

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