COMPARATIVE ASSESSMENT OF THE PHYSICAL DEVELOPMENT AND FUNCTIONAL STATUS OF ADOLESCENTS WITH MUSCULOSKELETAL DISORDERS AND THOSE ENGAGED IN SWIMMING

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Abstract: The article presents the results of a comparative analysis of the physical development and functional state of healthy adolescents engaged in sports and adolescents with musculoskeletal system pathologies.

Keywords: anthropometry, total measurements, functional state, vital lung capacity, Harvard step test, steady strength

Relevance: On the initiative of the President of the Republic of Uzbekistan Sh.M.Mirziyoyev, large-scale measures are being implemented in our republic to improve the health of children and adolescents, to involve them in physical education and sports. One of the main means of improving the health and correction of adolescents with disabilities in the field of movement is the use of physical exercises, which is not only a way to eliminate disabilities, but also to maintain and strengthen health. Physical exercises can be perceived as a long-term treatment and prevention, followed by a transition to rehabilitation, and then to the effects of training. Unfortunately, in AFC programs, information on the characteristics of the body structure of individuals with certain deviations in health is not taken into account, an individual approach is poorly applied. In your opinion, the most important component of rehabilitation - testing health indicators - is neglected in them.

The extent of the problem: Numerous studies conducted in the CIS countries have shown that over the past 20 years, the health of schoolchildren with functional disorders has been significantly increasing. In the first place are diseases associated with deviations in the functioning of the musculoskeletal system (respiratory system, cardiovascular system, nervous system, sensory system), an increase in the frequency of excess body weight has been noted. Taking into account the above, the following study was conducted.

Purpose of the work: Comparative assessment of the physical development and functional status of adolescents with musculoskeletal disorders who are engaged in swimming. The aim is to compare the level of physical development and functional status of students with musculoskeletal disorders and adolescents involved in swimming.

Methods and research process: Baseline: 60 adolescents with musculoskeletal disorders; 60 adolescents involved in swimming. 20 adolescents of each age group were selected in two separate groups. The following methods were used in the study:

Anthropometric indicators: a) body length, b) body weight, c) chest circumference, d) shoulder width.

Functional indicators: CTR - vital capacity of the lungs; Harvard step test, back muscle strength.

Generally accepted methods of mathematical statistics were used. The indicators obtained during the measurements were subjected to statistical processing: the arithmetic

mean (X) indicator was determined. To achieve the goal of the study, a systematic monitoring of the physical development and functional state of healthy schoolchildren aged 11-16 and adolescents with musculoskeletal disorders was carried out. For this, using anthropometric and functional methods, first of all, total and partial body measurements were taken and analyzed. In the examined children, it was observed that during adolescence, the growth of body length from total indicators was observed in accordance with biological laws. However, active body growth in length was observed in healthy adolescents between the ages of 15 and 16, and an increase in height of more than 6 cm was observed. The growth of the weight indicator also repeated the trend of body growth in length and was observed to develop in a similar way. At the age of 12-15, it was determined that the formation of body proportions is formed in the dolichomorphic type, and based on anthropometric indicators, an ecto-mesomorphic somatotype is formed according to the body mass index. In adolescents with disorders of the musculoskeletal system, the level of physical development is significantly lagging behind. Activation of longitudinal growth of the body was observed at the age of 12-13 and amounted to 7 cm. It is known that longitudinal growth in boys was observed at the age of 13, and this phenomenon was also proven to occur according to biological laws. The chest circumference index was evaluated in a comparative study and it was proven that the increase in this indicator in adolescents engaged in swimming is associated with the vital capacity of the lungs. The lag of this indicator was revealed in adolescents with deviations in the TSA.

In Table 1, partial signs of body measurements were also analyzed. These included arm length and leg length. It was found that arm length was 4.1 cm longer in adolescents who were swimming with an arm length of 13 cm and adolescents with musculoskeletal disorders compared to adolescents with a lower arm length. When comparing the two groups of 14-year-old adolescents, it was found that arm length was 6.70 cm longer in healthy adolescents.

Table 1.

Comparative assessment of physical development and functional status of schoolchildren aged 11-16 years with musculoskeletal disorders and engaged in swimming (Boys)

Young	**Static indicators**	**Boys**					
		Body length (cm)		**Body weight (0kg)**		**Body mass index**	
(schoolboys) TXA–musculoskeletal disorders		Swimming school students	Adolescents with ADHD	Floating school students	Ateenager has a violation of the TSA.	Swimming school students	Adolescents with ADHD
11 years old	n	10	10	10	10	10	10
Boys	x	150,5	140, 6	37,9	35.40,2	0,248	0,263
	Sx	1,094	1,211	1,108	0,834	0,0055	0,0063
12 years old	n	12	10	12	10	12	10
Boys	x	155,8	143.9	46,4	40.4	0,291	0,286
	Sx	1,438	1,775	1,379	1,016	0,0075	0,0091

	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001
13 years old	N	16	15	16	15	16	16
Boys	X	165,0	150.9	50,2	40,3	0,308	0,298
	Sx	0,995	1,053	6,938	1,943	0,0073	0,0067
	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001
14 years old	n	20	15	20	15	20	15
Boys	x	169,4	157,4	56,3	47,7	0,332	0,317
	Sx	0,653	1,059	0,656	0,853	0,0088	0,0057
	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001
15 years old	N	16	16	16	16	16	16
Boys	X	171,7	163.5	60,5	55,6	0,350	0,353
	Sx	0,850	2,232	0,880	1,590	0,0079	0,0085
	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001
16 years old	n	17	19	17	19	17	19
Boys	X	177,6	169, 3	65,0	59,1	0,369	0,367
	Sx	0,868	1,920	0,901	1,530	0,081	0,0095
	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001

Table 2.

Comparative assessment of the physical development and functional status of schoolchildren aged 11-16 years with musculoskeletal disorders and engaged in swimming (girls)

Young	**Statik ko‘rsatkichlar**	**Girls**					
		Body length (cm)		**Body weight (0kg)**		**Body mass index**	
Students involved TXA–girlswith musculoskeletal disorders		Swimming girls	Adolescent girls with a disorder in the TSA	swimming girls	There is a violation in the TSA	Swimming girls	Adolescent girls with a disorder in the TSA

					Teenage girls		
11 years old	n	10	9	10	9	10	9
	x	155.42	143.57	40,2	36.9. 2,	0,280	0,270
	Sx	1,063	1,960	0,712	1,866	0,0071	0,0059
12 years old	n	12	9	12	9	12	9
	x	160,4	149,73	43,5	40,7	0,284	0,296
	Sx	1,063	1,420	1,0	1,463	0,0077	0,0081
13 years old	n	9	9	9	9	9	9
	x	165,3	153.60	47,9	44.0	0,310	0,313
	Sx	1,092	1,595	0,919	1,336	0,0081	0,0069
14 years old	n	9	11	9	11	9	11
	x	167.5	157.66	55.7	52.1	0,0096	0,0072
	Sx	0,830	1. 400	0.920	1.62	0,0095	0,0070
15 years old	n	18	11	18	11	18	11
	x	169	160,08	57,5	53,4	0,340	0,347
	Sx	0,999	1,582	1,221	1,414	0,0078	0,0077
16 years old	n	12	10	12	10	12	10
	x	170,1	165,6	60,2	56,8	0,357	0,338
	Sx	0,857	1,146	0,843	1,18	0,097	0,0091
	friend The difference criteria	0,001	0,001	0,001	0,001	0,001	0,001

In healthy adolescents aged 14-15, it was found that arm length increased by 8.07 cm over a year. In adolescents with musculoskeletal disorders, the increase in leg length was only 3.10 cm. Thus, a lag in growth rates was detected in adolescents with musculoskeletal disorders (TXA). While the arm length indicators of 13-year-old swimming adolescents were 86.72 + 4.83 cm, the leg length of adolescents with musculoskeletal disorders was 80.90 + 4.50 cm, and the difference between the groups was -5.8 cm as a result of the comparative assessment. When comparing the two groups of 14-year-old adolescents, it was found that the leg length in healthy adolescents exceeded the arm length by -6.70 cm. In healthy adolescents aged 14-15, the arm length was 8.07 cm over the course of a year. In adolescents with musculoskeletal disorders, the increase in length was only 3.10 cm. In healthy adolescents aged 14, the leg length was 90.95 + 5.20, and in adolescents with musculoskeletal disorders 70 - 83.10 + 4.50, the difference between them was -7.85 cm. At the age of 15, it was also observed that growth processes occur especially actively, and the difference between the compared groups was 5.96 cm, and it was found that the growth rate is higher in healthy adolescents. Shoulder width plays a significant role in the formation of human stature. It was found that adolescents with disorders in the TSA (28.60 + 1.6 cm) had a lag in shoulder width in the initial period compared to healthy adolescents (32.90 + 1.8 cm). However, it was observed that the growth rates of this indicator in adolescents from 13 to -15 years of age occurred at the same rate. For example, the shoulder width of healthy adolescents at the age of 13 was 4.30 cm compared to adolescents with

disorders in the TSA. At 14 years of age, it was -4.58 cm, and at 15 years of age, the growth trend was maintained and the difference between them was -4.18 cm.

The Harvard step test index is a test that measures physical fitness and recovery ability. This test was performed in 13-15 year old swimmers. Physical fitness was assessed as “good” at 13-14 years old, and “excellent” at 15 years old. In adolescents with impaired TSA, it was assessed as “below average” at 13 years old, “average” at 14 years old, and “below average” at 15 years old. Thus, the level of physical fitness in adolescents with impaired TSA after the health-improving and corrective measures used during the experiment significantly increased. The level of development of the back muscles, which express the strength of the body, at the age of 13-15 is in accordance with biological laws in healthy adolescents, but due to this contingent sports, the indicators of physical activity are much higher than the normative indicators. The obtained indicators allowed us to draw the following conclusions - in adolescent swimmers, a sharp increase in such indicators as chest, vital capacity of the lungs, chest circumference, and body strength was observed between the ages of 14 and 15. The level of physical development of 12-15-year-old schoolchildren who do not engage in sports and adolescents with disabilities in the LS was manifested not only in anthropometric indicators, but also in functional indicators - vital capacity of the lungs, body strength, and Harvard step test indicators.

Conclusion: The formation of functional indicators and morphological development of adolescents is directly dependent on age, but the level of their development in each age group is determined by the individual biological maturity of the organism, the influence of pathological processes and sports.

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