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MODERN APPROACH TO THE CORRECTION OF POSTURE DISORDERS IN CHESS-PLAYING CHILDREN

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ABSTRACT

Improper body posture, which we can often observe during chess practice, causes the spine to curve, the thorax and limbs also suffer. Therefore, it is necessary to search for optimal and effective means of correcting these disorders. Therefore, it is necessary to search for optimal and effective means of correction of these disordersThe article presents the data of the study of the effectiveness of a complex of rehabilitation measures, including Nordic walking, kinesiotaping and electromyostimulation, in children chess players with posture disorders

KEYWORDS: *Children, Chess, Posture Disorders, Rehabilitation, Nordic Walking, Electromyostimulation, Kinesiotaping*

INTRODUCTION

Posture is the usual position of the body in space, a pose that is explained by constitutional, hereditary factors, depending on muscle tone, the state of the ligamentous apparatus, and the severity of physiological curves of the spine. [1,2,12]. Correct posture is one of the essential features of a harmoniously developed person, an external expression of his physical beauty and health. Good physical development and full health of children are possible only if correct posture is maintained [1,3,4].

Correct posture is a healthy spine, as it is the support of the entire body. Unfortunately, many people underestimate the importance of correct posture, which naturally leads to a number of health problems [5-7,10]. If the child has correct posture, then the load on the spine will be distributed evenly. The curves of the spine provide flexibility and soften the impacts of movement. The lower part of the spine is subject to the greatest load, especially when the child is sitting. However, there is nothing harmful or unnatural in this load, since they are constantly under the influence of gravity and constant movement. Difficulties will arise if you do not pay attention to maintaining correct posture. The spinal column is very closely connected with the circulatory and nervous systems, and quickly reacts to any disease of the body [8,9,11].

Incorrect body position, which we can often observe during chess practice, leads to the spine being curved, and the chest and limbs also suffer [10,11].

AIM OF THE STUDY

The aim of the study is to study the effectiveness of rehabilitation measures for posture disorders in children involved in chess..

MATERIALS AND METHODS

The study was conducted at the Research Institute of Rehabilitation and Sports Medicine at the SSMU in 2022-2025. We examined 130 children aged 7-16 years (mean age 12.7±2.68 years), including 81 (62.3%) boys and 49 (37.7%) girls. (fig.1).

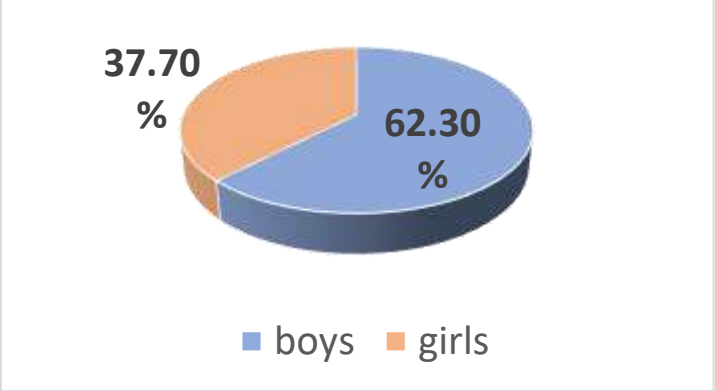


Figure 1. Distribution of Children by Gender

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During the research, all children were divided into a main group (n=78, 60%), who received the rehabilitation measures complex we developed, and a comparison group (n=52, 40%), who received standard treatment.

To determine the scope of rehabilitation measures, data from anamnesis, clinical examination, assessment of physical development, and optical computed tomography were used. In this case, the depth of the cervical and lumbar lordosis, lateral curvature of the spine, and the tilt and rotation of the shoulder girdle and pelvis were taken into account. Functional motor tests were also used to help identify the severity of posture disorders. The following tests were used for evaluation: spine mobility, strength endurance of the back extensor muscles, strength endurance of the abdominal muscles.

The rehabilitation program for children in the main group included Nordic walking, kinesiotaping, and electrical myostimulation. The effectiveness of the developed exercise program for children with posture disorders was assessed in the dynamics of a functional study.

The obtained results were subjected to mathematical processing. Statistical reliability was determined by the Student coefficient, and the data were considered reliable at a value of $p \leq 0.05$.

RESEARCH RESULTS

When studying the sports anamnesis, it was established that the length of service in chess was from 1 year to 7 years. On average, the length of service was 2.98±1.34 years (table 1).

Table 1
Distribution of children depending on the length of time they have been playing chess

	< 1 year		2-3 years		4-5 years		6-7 years	
	abs	%	abs	%	abs	%	abs	%
Boys (n=81)	9	6,9	43	33,1	25	19,2	4	3,1
Girls (n=49)	9	6,9	25	19,2	11	8,5	4	3,1
Total (n=130)	**18**	**13,8**	**68**	**52,3**	**36**	**27,7**	**8**	**6,2**

To assess the effectiveness of the rehabilitation program we developed, diagnostics of physical development indicators were conducted. As the results showed, there were no reliable differences between the compared groups in any of the testing indicators (P>0,05). After the rehabilitation, we observed a significant improvement in the indicators in the main group, with the exception of height, which did not change throughout the study. The results of the assessment of the physical development of children are presented in the table 2.

Table 2
Comparative analysis of physical development indicators of children before and after rehabilitation

Indicators	Indicators		After rehabilitation		p
	MG (n=78)	CG (n=52)	MG (n=78)	CG (n=52)	
height, sm	154,2±2,6	155,4±2,1	154,2±2,6	155,4±2,1	>0,05
weight, kg	45,7±3,12	42,3±1,9	43,2±2,12	41,9±1,3	>0,05
chest circumference, sm	78,2±4,1	77,8±3,9	77,5±3,4	77,1±2,6	>0,05
wrist dynamometry, kg	17,3±0,4	16,5±0,6	18,8±0,8	16,9±0,7	>0,05

Next, we studied the assessment of the functional state of the spinal column based on functional tests for spinal mobility, strength endurance of the back extensor muscles and abdominal muscles (table 3).

Table 3
Comparative analysis of the functional state of the spine

Indicators	Indicators		After rehabilitation	
	MG (n=78)	CG (n=52)	MG (n=78)	CG (n=52)
spinal mobility	8,12±0,93	8,6±0,74	14,1±0,6	8,1±0, 9
strength endurance of the back extensor muscles	64,7±4,18	66,4±4,03	89,1±2,99	67,2±3,71
strength endurance of abdominal muscles	11,7±3,11	11,5±2,26	16,2±3,41	12,8±3,16

Note: p≤0.05 – reliability of differences between the compared groups

The results of functional testing of children in both groups before rehabilitation did not show significant differences. Thus, the backward mobility of the spine was 8.12±0.93 cm and 8.6±0.74 cm, the strength endurance of the back extensor muscles was

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64.7±4.18 and 66.4±4.03, the strength endurance of the abdominal muscles was 11.7±3.11 and 11.5±2.26, respectively. After rehabilitation measures were carried out to assess their effectiveness, repeated functional testing revealed a significantly ($p<0.05$) increase in spinal mobility and strength endurance of the back extensor and abdominal muscles in children of the main group. Thus, the backward mobility of the spine was 8.12±0.93 cm and 8.6±0.74 cm, the strength endurance of the back extensor muscles was 64.7±4.18 and 66.4±4.03, the strength endurance of the abdominal muscles was 11.7±3.11 and 11.5±2.26, respectively.

Thus, with a static load, muscle contraction is not associated with the movement of the student's body in space; in this case, the muscles work without changing their length. In this case, the muscle group compresses the blood vessels, depriving themselves of nutrition and the flow of oxygen-rich blood. The higher muscle tension, the faster muscle fatigue occurs. Thus, the results of the study showed that in order to strengthen the muscular corset and form correct posture, as well as prevent its disorders, it is necessary to include dosed physical exercise in the complex of chess training sessions.

CONCLUSION

The results of the study showed that the inclusion of Nordic walking, kinesiotaping and electromyostimulation in the complex of rehabilitation measures will not only help correct posture disorders and reduce muscle tension, but also prevent the development of the above-mentioned disorders of the musculoskeletal system.

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