Analysis of physical fitness indicators of school students with hearing impairments

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Abstract

Purpose: To study and analyze the physical fitness indicators of deaf and hard of hearing students.

This study examines and analyzes the physical fitness indicators of deaf and hard of hearing school students with hearing impairments.

Methods: Methods of literature analysis, questionnaire surveys, pedagogical observation, expert assessment, pulse measurement, pedagogical experiment, and mathematical statistics.

Keywords: physical fitness, physical development, means and methods of physical education, extracurricular forms.

Introduction

Globally, people suffer from hearing impairments of varying degrees, of which approximately 32 million are children under 15 years of age. Despite recent advances in medicine, the gradual increase in the number of children with hearing impairments is causing serious concern among education system representatives.

This is because the complete or partial loss of hearing ability negatively affects a child's overall development, psychomotor state, and social adaptation. In the activities of general education schools, timely identification of children with hearing impairments and implementation of appropriate pedagogical interventions play an important role in their development.

Therefore, the content and methods of organizing educational work with children with hearing impairments require a special approach.

Results and discussion

Today, pedagogical correction, especially developmental measures based on adaptive physical education tools, plays a crucial role in improving the physical fitness of deaf-mute students with hearing impairments and facilitating their adaptation to social life.

Modern scientific research aims to enhance adaptive physical education methods and increase the effectiveness of education and upbringing through in-depth studies of the physiological and psychological characteristics of children with hearing impairments. However, there are some contradictions among existing scientific views on this matter, and many studies have not sufficiently explored the pedagogical possibilities of using the potential of visual analyzers and other sensory organs to compensate for hearing impairments.

This situation necessitates a more thorough investigation of the adaptive physical education system for preschool and school-age children with hearing impairments, as well as the development of methodological foundations to increase its effectiveness. During our research, we studied the physical fitness indicators of schoolchildren with hearing impairments, analyzed the results, and developed necessary recommendations.

During our research, we assessed the physical fitness of schoolchildren with hearing impairments. A total of 16 students participated in the pedagogical experiment, and we divided them into two groups: experimental *(8 students)* and control *(8 students)*. We evaluated the level of physical fitness of deaf-mute students through the following tests:

The level of speed development in deaf-mute students with hearing impairments was assessed using the 60m run test, agility with the *3x10m* shuttle run, endurance with the *2000m* run, explosive strength with the standing long jump, strength with pull-ups on the horizontal bar, endurance and balance by lifting the body to a *90-degree* angle with legs together while lying on the back, speed and agility with rope jumping, and absolute strength by throwing a tennis ball.

In the 60-meter sprint test, the experimental group subjects recorded an average of 10.79±0.33 seconds before the study and 8.01±0.45 seconds after the study. In the 3x10-meter shuttle run test, they recorded 7.65±0.26 seconds before the study and 7.20±0.48 seconds after the study. In the 2000-

meter run test, they averaged 9.15±1.1 minutes before the study and 8.12±0.89 minutes after the study. In the standing long jump test, they averaged 175.12±6.92 cm before the study and 200.14±4.40 cm after the study. In the pull-up test on a horizontal bar, they averaged 5.20±0.83 times before the study and 9.45±1.01 times after the study. In the test of raising the body to a 90° angle with legs together while lying on the back for 1 minute, they averaged 35±2.60 times before the study and 41.15±1.98 times after the study. In the jump rope test, they averaged 45.6±5.35 times before the study and 55.42±3.36 times after the study. In the tennis ball throw test, they recorded an average of 21.90±2.0 meters before the study and 28.90±1.90 meters after the study.

In the 60-meter run test, the control group subjects averaged 10.89±0.55 seconds before the study and 10.73±0.68 seconds after the study. In the 3x10-meter shuttle run test, they averaged 7.98±0.32 seconds before the study and 7.65±0.43 seconds after the study. In the 2000-meter run test, they averaged 9.99±0.89 minutes before the study and 9.45±0.76 minutes after the study. In the standing long jump test, they averaged 171.02±4.23 cm before the study and 172.16±2.44 cm after the study. In the pull-up test on a horizontal bar, they averaged 4.90±0.36 times before the study and 5.14±0.43 times after the study.

In the test of lifting the body up to 90° with legs together while lying on the shoulder blades for 1 minute, they averaged 29.4±1.89 times before the study and 30.06±1.89 times after the study.

In the jump rope test, they averaged 44.02±3.43 times before the study and 47.08±2.12 times after the study. In the tennis ball throw test, they averaged 21.09±1.01 meters before the study and 21.8±1.08 meters after the study.

Table. Comparative analysis of physical fitness indicators for deaf-mute students with hearing impairments

Control tests	Beginning of the experiment			End of experiment			Relative growth, %	t	P
	$\bar{X}$	G	V %	$\bar{X}$	G	V %			
Experimental group n=8									
60m Run (sec.)	10.79	0.33	3.06	8.01	0.45	5.62	2.78	13.9	<0.001
3x10m shuttle run (sec.)	7.65	0.26	3.39	7.20	0.48	6.67	2.45	2.37	<0.01
2000m Run (sec.)	9.15	1.11	12.13	8.12	0.89	10.96	1.03	3.12	<0.001
Standing long jump (cm)	175.12	6.92	3.95	200.14	4.40	2.19	5.00	8.66	<0.001
Pull-ups (repetitions)	5.20	0.83	15.96	9.45	1.01	10.68	4.25	9.24	<0.001
Lifting the body upwards by 90° with legs together while lying on the back (1 min, repetitions)	35.00	2.60	7.42	41.15	1.98	4.81	6.15	5.64	<0.001
Jump rope (1 min, repetitions)	45.60	5.35	11.73	55.42	3.36	6.06	9.82	4.40	<0.001
Tennis ball throw (meters)	21.90	2.00	9.13	28.90	1.90	6.57	7.00	4.83	<0.001
Control group n=8									
60m run (seconds)	10.89	0.55	5.05	10.73	0.68	6.34	0.16	0.51	>0.05
3 x 10m shuttle run (seconds)	7.98	0.32	4.01	7.65	0.43	5.62	0.33	1.83	>0.05
2000m run (seconds)	9.99	0.89	9.68	9.45	0.76	8.04	0.54	1.31	>0.05
Standing long jump (cm)	171.02	4.23	2.80	172.16	2.44	1.42	1.14	0.66	>0.05
Pull-ups (repetitions)	4.9	0.36	7.35	5.14	0.43	8.36	0.24	1.20	>0.05
Lifting the body upwards by 90° with legs together while lying on the back (1 min, repetitions)	29.4	1.89	6.42	30.06	1.08	3.59	0.66	0.86	>0.05
Jump rope (1 min, repetitions)	44.02	3.43	7.77	47.08	2.12	4.60	3.06	2.16	<0.05
Tennis ball throw (meters)	21.09	1.01	4.79	21.80	1.08	4.95	0.71	1.36	>0.05

Conclusion

In the course of the study, all the main indicators of physical fitness significantly

improved in the participants of the experimental group, while in the control group such changes were not as pronounced.

During the research, an animated program was implemented for students with hearing impairments in physical education classes and extracurricular activities, integrating elements of visual gestures, active games, and sports games.

This methodological approach increased the effectiveness of students' comprehension of exercise content, contributed to the stabilization of balance and coordination movements, the consistent development of physical qualities, and ensured active participation of students in the lesson process.

The obtained results scientifically confirm that this program is an effective tool for improving the physical fitness of students with hearing impairments.

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