

Levelling Indices of Physical Health, Physical Fitness and Anxiety Reduction in Schoolchildren of Seven and Nine with Hearing Impairment by Means of Experimental Program of Physical Education

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Abstract: The study captures the data of physical health indices, physical fitness and also the level of anxiety in the 7-9 year-old children with hearing disorders on the basis of comparative with corresponding indices obtained from the children of their age having acute hearing. Considerable lags are in indices of cardiovascular and respiratory systems, physical fitness in hearing-impaired children and also in hyperanxiety of the school children having hearing difficulty according to Taylor and Spielberg techniques. With the aim of leveling indices-lagging, the researchers have suggested the experimental correction and health promotion program of physical education of younger school children with hearing impairment. During two school years (in 2012-2014), it was conducted forming educational experiment on the basis of two special (correction) boarding schools of I, II types. In the experimental group, there were 20 hearing-impaired school children (n = 10 boys, n = 10 girls) from Yelabuga (Russia, Tatarstan). The subjects of the control groups (n = 10 boys, n = 10 girls) were the children of the same age from Kazan (Russia, Tatarstan). Efficiency of the developed program had been checked twice a year by in-between investigations. The study also gives theoretical and experimental substantiation of correction and fitness program of physical training of the younger school children with hearing-impairment.

Key words: Physical health, physical fitness, anxiety level, 7-9 year-old school children with hearing impairment, experimental correction and health program of physical training

INTRODUCTION

Welfare of the state is expressed not only by economic but social factors as well, one of which is life quality and adaptation of handicapped persons in social environment. Currently, in Russia at government level, it has been created favorable conditions for having a disabled person become closer to society.

Hearing loss or difficulty is today, one of the widespread handicaps not only among senior and adult population, hearing disorder often occurs in children and teenagers. More than 360 million people in the world suffer from incapacitating loss of hearing, 32 million of them are children in the age of 15. The global estimate of prevalence of this problem, stated by the World Health Organization in 2013, is indicative of it (Anonymous, 2015).

The results of comparative analysis of the indices of physical health in schoolchildren suffering from hearing impairment and hearing schoolchildren of the same age within the framework of ascertaining experiment have detected considerable lags of indices of cardiovascular and respiratory systems at rest and after physical activity

in the hearing-impaired children of 7-9 years old. The schoolchildren with hearing impairment have considerable difference when testing their physical fitness according to 7 tests from 10, the results of 3 tests have not shown significant difference ($p < 0.05$). The analysis of school anxiety indicates that the children with hearing pathology are characterized by high level of anxiety according to both Taylor's and Spielberg's techniques (Shatuniv, 2013).

Particular role in formation of physical and mental disabilities in deaf and hearing-impaired children, correction their primary defects is assigned to physical education, which contains several deficiencies being evident in the process of formation of hearing-impaired person (Baikina, 1991; Kalmykov, 2007).

Unfortunately, today the methods oriented to education of physical exercise is used today insufficiently. Conducive to this fact are handicaps of deaf and hearing-impaired school children that condition complication in organization of physical exercises training. The leading role is assigned in physical education of school children with hearing impairment to total motor activity: out of doors plays, running, ski trips, general

developing exercises, muscle and flexibility developing exercise. As a rule, execution of these exercises is not accompanied with learning of motion techniques which results undoubtedly in underdevelopment of coordinating abilities, equilibrium and speed (Dzyurich, 1967; Kolosovskaya, 1996).

High necessity in motor thinking development of schoolchildren with hearing impairment is explained by impaired function of motor analyzer expressed in motor stress and excessive constraint. It is expressed, first of all, in low indices of quickness, coordination and speed-power abilities, on the general physical and mental under development (Cushing, 2008a, b; Esther, 2011; Furman, 1995; Gayle, 1990; Gheysen, 2008).

The investigation describes elaboration and experimental substantiation of advantages and simplicity of experimental methodologies and techniques included by the correction program of physical education for younger schoolchildren with pathology of hearing.

MATERIALS AND METHODS

The investigation is based on such methods as complex analysis of physical health indices according to Khrushcheyev (1994) and physical fitness, analysis of school anxiety state according to techniques of Taylor and Spielberg, pedagogical observation forming educational experiment.

Ascertaining experiment comprised the study of indices of physical health. Physical fitness testing included 10 tests:

- Long standing jumping
- About 30 m jumping
- Running snake
- Shuttle run
- Throwing a medicine ball from a sitting position
- Bending forward from a sitting position
- Romberg's test
- Chin-up
- Rising of the trunk in saddle from a prone position
- About 6 min running

The analysis of school anxiety was conducted by Taylor technique and Spielberg technique. Forming educational experiment was conducted during two school years (2012/2014) in environment of special (correction) boarding school of I, II type, Yelabuga (Russia, Òarstan). The sections of variation experimental program were applied during morning exercises (yoga, respiratory gymnastics by Ò.N.Strelnikova), airing (correction and health outdoor games for the deaf and hearing-impaired

by V.L. Strakovskaya) and in the process of physical trainings two times a week for 20 min (corrigent athletics, technical elements of basketball, the elements of fitball-aerobics and step-aerobics, the exercises correcting respiratory system in role-playing and the elements of psychogymnastics by M.I. Chistyakova).

Efficiency of correction and health program of physical education of the schoolchildren of 7-9 years old with hearing impairment by means of the reinvestigations having been conducted two times a year.

The participants of the experimental complex correction and health program were 20 hearing-impaired school children aged 7-9 ($n = 10$ boys and $n = 10$ girls). The subjects of the control groups ($n = 10$ boys and $n = 10$ girls) were the schoolchildren of the same age from special (correction) boarding school of I, II types named after Ye. G. Lastochkina, Kazan (Russia, Tatarstan).

The analysis of methodological literature and also the obtained results of ascertaining investigation allowed to proceed to elaboration of a complex correction and health program of physical education of the schoolchildren aged 7-9 with hearing impairment for leveling of the lagging indices. In terms of the forming experiment, we distinguish the following sections of variation unit.

Corrigent athletics was oriented to realization of one of the principles of the program-formation of motor thinking through training technique of running and jumping. In this case, we have used a motion limit. Running technique, distance and height of jumps were formed by means of the tasks on a certain trajectory and amplitude of motor actions.

We used the exercises "Visualization enhancement" (starts, jumping and throwing). The given means allow to realize one of the principles of the program "Formation of the Attention". It is achieved at the moment of fulfilling exercises on turned the light on with maximum speed and force. Under these conditions, the level of concentration of attention and motor density of the lesson increase. In addition, the nature of the exercises can effectively form a power-speed abilities and quickness.

Correction and wellness outdoor games for the deaf and hearing-impaired according to V.L. Strakovskaya and technical elements of basketball were aimed at correcting the quickness and agility. The game tasks are indispensable means of raising motivational background and the mood in general. In addition, the games have a positive effect on the psyche of children and the formation of their personality traits. The elements of basketball form fine and gross motor of hand and training elements of technique contribute to the development of thinking and the formation of coordination abilities.

The elements of yoga corrects flexibility. The exercises in this section have beneficial effects on the nervous system. Performing yoga exercises is going on in a story form which creates additional interest in children of the junior school age.

With elements of fitball-aerobics and step-aerobics, it is realized one of the main principles of the program the principle of residual auditory perception. This is achieved by vibration sensitivity of the school children with hearing impairment and performing rhythmic and coordinated movements to the music. Moreover, aerobics positively effects on the cardiovascular and respiratory systems and also develops power abilities.

The development of the respiratory system was carried out by means of breathing exercises by A.N. Strelnikova. A feature of this gym is doing short and sharp intakes of breath simultaneously with the movements that prevent this phase of respiration. Under these conditions, the implementation of the respiratory cycle is forming effective respiratory muscles and increasing the reserves of the respiratory system.

The correction respiratory system exercises are the tasks in game form with maximum inhalation and exhalation followed. To such means we referred blowing out candles, blowing balloons tied, blowing various objects with a solid surface and water from different starting positions and distances. We also used the relay races with such exercises.

The correction respiratory system exercises in a game form are included in the program of physical education and chosen, first of all, in order to correct the respiratory system. At the same time, there is an increasing interest in children and maintaining a positive emotional state.

To reduce the level of anxiety in the experimental group of school children the elements of psychogymnastics by M.I. Chistyakova have been included into the program. This section comprises studies of expressing the emotions and the exercises per se that liberate the children in manifesting the emotional state, learn to control their emotions, reveal the motives to the manifestation of the positive personal qualities and also unite the children in a group.

RESULTS AND DISCUSSION

Experimental substantiation of the program of physical education of the school children aged 7-9 with hearing impairment is graphically in Fig. 1-4, which demonstrate positive dynamics of the studied indices in schoolchildren of the experimental group in regard to school children of the same age from the control group.

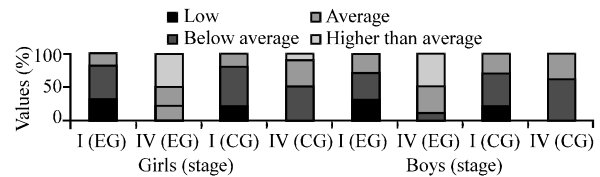


Fig. 1: Dynamics of indices of physical health level of the subjects of junior school age with hearing impairment

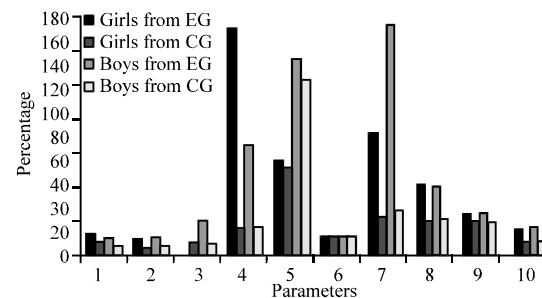


Fig. 2: Growth of indices of physical fitness of the subjects from experimental and control groups of junior school age within experiment time (%). Notes here and in the following figures: 1) About 30 m running; 2) About 3×10 m shuttle running; 3) Long standing jump; 4) Forward benders from sitting position; 5) Chin-up; 6) About 6 min running; 7) Romberg's test; 8) Throwing a medicine ball from the sitting position (1 kg); 9) Rising the trunk in saddle position; 10) Running snake (10 m)

In the school children of the experimental group, it is observed the highest growth of indices of physical health in comparison with the schoolchildren of the control group. In the experimental group of girls of junior school age in 50% of subjects the level of health is above average, in 30% average, in 20% below average. Boys of the experimental group have health indices: above average 50%, average 40% below average 10%. The schoolchildren of the same age in the control group have levels of health higher than average 10 and 0%, average 40 and 40% below average 50 and 60%, respectively.

In the school children of experimental group, it is observed substantial growth of indices of physical fitness: the growth in indices of motion sphere in girls from experimental group accounted for 10.5 and 174% in boys from experimental group from 11. 5-176.8%, in the control group of girls from 4.2-67%; in the control group of boys from 3-134%.

The level of anxiety in the schoolchildren from the experimental group has considerably lowered. It is seen

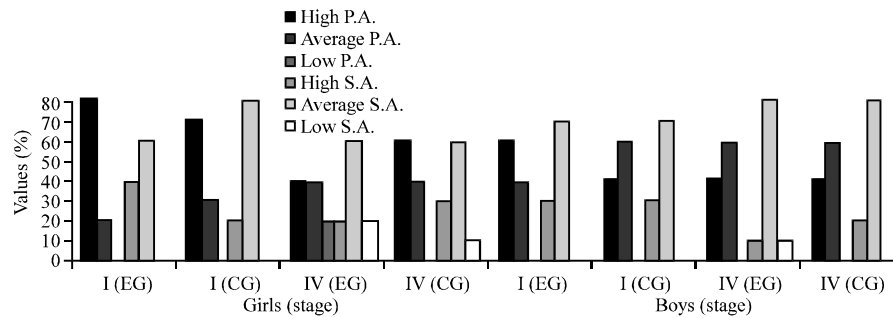


Fig. 3: Changes in indices of anxiety level of the subjects of junior school age from experimental and control groups according to Spielberg technique within experiment time; PA) Personality Anxiety; SA) Situational Anxiety

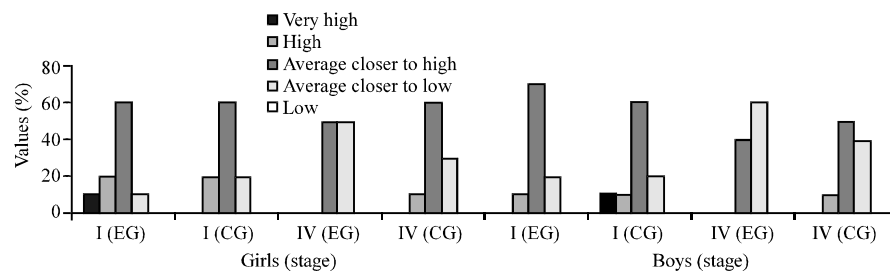


Fig. 4: Changes in indices of anxiety level of the subjects of junior school age from experimental and control groups according to Taylor technique within experiment time

according to Spielberg technique that high level of personality anxiety in girls and boys from the experimental group within experiment time has lowered by 40 and 20%, high level of situational anxiety has lowered by 20 and 20%. In the control group of girls and boys the lowering of high level of personality anxiety accounts for 10 and 0%, high level of situational anxiety of girls has increased by 10%, decreased in boys by 10%.

The analyzed indices of anxiety level determined by Taylor technique are also indicative of substantial lowering of anxiety level in children of the experimental group.

Summary: It has been determined that by implementing experimental program, it is observed considerable improvement of the indices of physical health and physical fitness, lowering the level of personality and situation anxiety according to Spielberg technique and also the level of anxiety according to Taylor technique in children of seven-nine years old with hearing disorders as compared to the results from the children of control group.

CONCLUSION

Thus, the results of the conducted two-year educational experiment has shown that important difference of ($p < 0.05$) between the indices of physical

health, physical fitness and also lowering anxiety in schoolchildren from the experimental group in comparison with schoolchildren from the control group. This allows to indicate the efficiency of experimental remedial-fitness program of physical training intended for younger school children with hearing disorder under conditions of special (correction) boarding school of I, II types.

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