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UDC 376.42

DEVELOPMENT OF MOTOR ABILITIES IN CHILDREN WITH GENERAL BEHAVIORAL AND MENTAL DISORDERS

A.Kh. Musralinova, E.S. Stotskaya, Yu.S. Eliseeva

*FSBEIHE «Siberian State University of Physical Education and Sports»,
Omsk, Russian Federation*

E-mail: musralinova95@mail.ru

Abstract. The article presents the features of the development of motor abilities in children with general behavioral and mental disorders. In the classroom, a methodology was developed that includes five blocks of exercises aimed at developing speed, strength, general endurance, dexterity and flexibility, depending on the orientation maximum two were included. An important feature was the use of visual methodological cards with tasks, as well as the structuring means and methods that made it possible to improve physical qualities and indicators of vestibular stability, which were noted at a statistically ($p \leq 0.05$) significant level.
Keywords: behavioral disorders, mental disorders, physical qualities, health and fitness recreational classes, vestibular stability, visual method cards.

Аннотация. В статье представлены особенности развития двигательных способностей у детей с общими расстройствами поведения и психическими нарушениями. На занятиях была разработана методика, включающая в себя, пять блоков упражнений, направленных на развитие быстроты, силы, общей выносливости, ловкости и гибкости, в зависимости от направленности включалось не более двух. Важной особенностью являлось использование визуальных методических карточек с заданиями, а также структурирование средств и методов, которые позволили улучшить физические качества и показатели вестибулярной устойчивости, которые отмечены на достоверно ($p \leq 0,05$) значимом уровне.
Ключевые слова: расстройства поведения, психические расстройства, физические качества, физкультурно-оздоровительные занятия, вестибулярная устойчивость, визуальные методические карточки.

In modern society, there are more and more children with autism, Down's syndrome, mental retardation, attention deficit hyperactivity disorder, that dictates the need for continuous improvement of guidelines for this category of children.

Children with mental disorders have a number of features that can demonstrate themselves in a possible lack of intellectual, speech, mental development and a decrease in physical qualities, requiring continuous rehabilitation and habilitation of children [p. 135, 3].

Physical education and health-improving classes are aimed at the rehabilitation and habilitation of children, which, therefore, will form new motor skills in the child, improve the physical qualities, and also have a positive effect on the psycho-emotional state, intellectual abilities and the ability to socialize in society.

Purpose of the study: theoretical and experimental substantiation of the methodology for the development of motor abilities in children with general behavioral and mental disorders.

Material and methods. The research was carried out at the Department of Theory and Methods of Adaptive Physical Education of the Federal State Budgetary Educational Institution of Higher Education 'Siberian State University of Physical Education and Sport'. The study involved 12 children aged 8-10. The group included children with autism, mental retardation, Down's syndrome, and a child with attention deficit hyperactivity disorder. Pedagogical testing included an assessment of five basic physical qualities, such as speed, strength, endurance, agility, flexibility, which were assessed using the age-related physical norm according to V.I.Lyakh. These physical qualities were assessed using specially selected tests: «Running 30 m in place», «Standing long jump», «Bench sit-up», «Shuttle run 3x10 m», «Forward inclination of the body with straight legs».

Vestibular stability was assessed using the stabilometric apparatus «Stabilan-01-2», the computer program «StabMed» version 2.08, a PC monitor displaying graphic data on the course of the session. Frontal displacement (forward - backward), sagittal displacement (left - right) (Fig. 1) and the quality of the balance function (Fig. 2) were assessed. The better the score was considered, the closer the scores were to zero, and if they were scattered and farther from zero, the scores were considered worse.

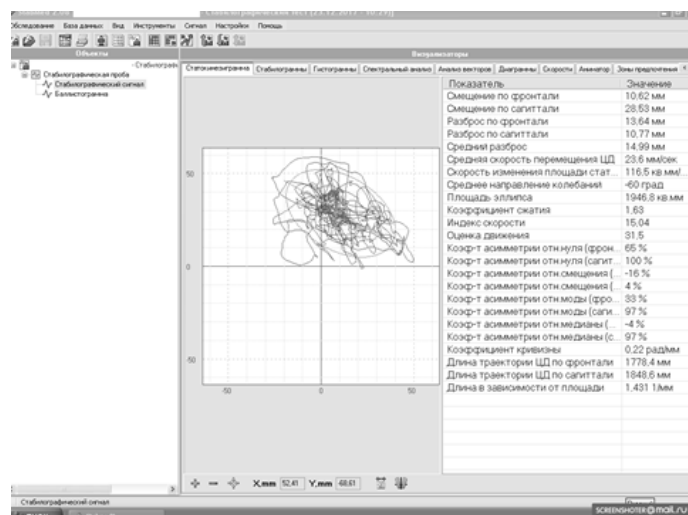


Fig. 1. Frontal and sagittal displacement of the center of gravity

To calculate the results, the methods of arithmetic mean values, standard deviations and the T-Wilcoxon test were used.

Results and its discussion. When analyzing physical indicators, children were conveniently classified into four groups, taking into account the diagnosis. In the tests carried out in terms of physical indicators, children showed low indicators. In children with mental retardation (mental retardation) and Down's syndrome, the results in the tests «Running 30

meters in place», «Shuttle run 3x10 m», «Standing long jump from a place» and «Bench sit-up», the result was significantly better than children with autism and ADHD (attention deficit hyperactivity disorder). In the test «Forward inclination of the body with straight legs» in children with CRD, the results on this scale were significantly higher than in children with autism, Down’s syndrome, and ADHD.

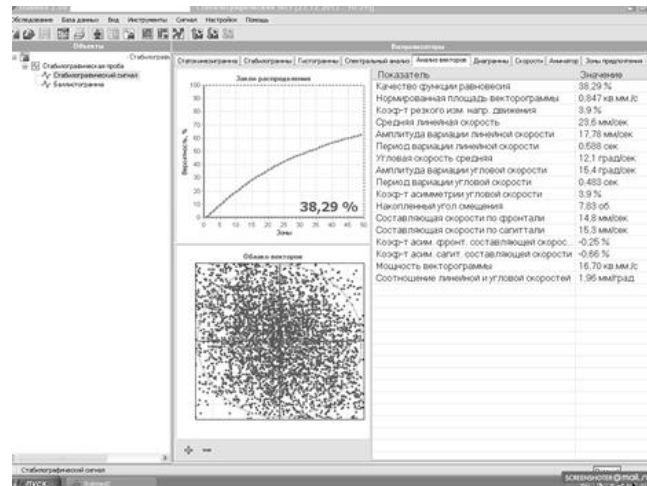


Fig. 2 Quality index of the equilibrium function

In children with general behavioral and mental disorders, the frontal displacement was 7.8 ± 3.4 mm, the sagittal displacement was 39.0 ± 13.2 mm, and the quality of the balance function was 55.0 ± 15.1 . The scatter of indicators indicated impairment of balance functions, which was one of the main problems accompanying movement disorders in the clinic of nervous diseases. Only 9 children out of 12 managed to conduct the study the first time, since 3 children could not stand still, were distracted, and got off the platform. As a result of assessing physical indicators and indicators of vestibular stability of children, a methodology for the development of motor abilities was developed. The structure of the lesson consisted of introductory, preparatory, main and final parts. Classes were conducted with a health-improving focus at least twice a week, lasting no more than 60 minutes, the number of exercises depended on the physiological characteristics of the children. The preparatory part was aimed at preparing the body for the upcoming lesson. The lesson began with walking (walking is normal, on toes, heels, jumping, back forward, squatting, in a half-squat, from heel to toe, with a 360-degree turn at the signal), after walking and running, they switched to general developmental exercises. The preparatory part lasted 10-15 minutes. The construction of the main part of the lesson was realized with the help of various combinations of exercise blocks, depending on the tasks and the nature of the lesson. One lesson included no more than two blocks out of five, which were combined with each other depending on the tasks. Such a load had a broader, but less profound effect on the child's body (Table 1).

Table 1 - Complex development of physical qualities in physical education and health-improving classes in children with general behavioral disorders and mental disorders

Blocks	rapidity	force	endurance	dexterity	flexibility
rapidity		*	*	*	*
force	*		*		
endurance	*	*		*	
dexterity	*	*	*		*
flexibility	*			*	

Note: * - combining blocks

In the first block of exercises, the means and methods were aimed at developing speed abilities. For development, repeated, playful, competitive methods were used, as they stimulated in children a sense of rivalry, the struggle for superiority, all this was reflected in the results. The block of exercises consisted of running in segments at intervals of rest, various outdoor games, relay races from different starting positions [p. 35, 4]. In the second block of exercises, the means and methods were aimed at developing strength abilities. Children of primary school age were focused on speed-strength qualities and the development of strength in the muscles of the arms, legs, back and abdominal muscles. For this block, circular and repeated methods were used. The block of exercises included strength exercises followed by acceleration, high jumps, exercises with objects, exercises «by stations». In the third block of exercises, the means and methods were aimed at developing general endurance. Since cyclic exercises, performed in aerobic mode, have the widest application for the development of endurance, therefore uniform, repetitive, interval, competitive, game methods were used in this block. The block of exercises included outdoor games, long-distance running, alternating running and walking at intervals. In the fourth block of exercises, the means and methods were aimed at developing coordination abilities. The development of coordination abilities play a huge role for this category of children, since this is due to the deficiencies of the higher levels of regulation, as well as severe hypokinesia (V.I. Lyakh, 2000). Exercises were carried out on a bench, on a rail, with the inclusion of roller skating, finger gymnastics with exercises on both hands at the same time, relay races were carried out on a signal, various options of shuttle running with the use of toys, and a coordination ladder was included in the lesson. In the fifth block of exercises, the means and methods were aimed at developing flexibility. To improve flexibility, static stretching and multiple repetition techniques were used. Multiple repetition included various inclinations of the body, repeated springy movements. The static stretching method included exercises where the child performed stretching using additional weights from several seconds to one minute [p. 23, 1].

The number of exercises was selected empirically, depending on age standards, physical fitness and physiological characteristics of children. The main part lasted approximately 25-30 minutes. The final part of the lesson was aimed at restoring the body after stress. In the final part, the children were given swing, stretching exercises or sedentary games. After the physical education and health improvement classes, the well-being of the children was assessed, the results of the lesson were summed up, homework was given to consolidate the motor action. The final part of the lesson took 5-7 minutes.

During the classes, a differentiated approach was taken into account in the selection of physical exercises, depending on the form of the disease. For children with ADHD, attention exercises were used, making sure that the child completed the task to the end and only at the instructor's command. Clearer structured phrases were used with children with autism. For children with Down syndrome and DPD, the exercise was shown from the preparatory position (PP) - lying, sitting on an elevated surface, while learning motor action, they gave exercises of a holistic nature. To facilitate communication and learning new skills of the child with the instructor, visual methodical cards were developed in each block of exercises [p. 15, 2]. When conducting control testing in children with general behavioral and mental disorders, positive changes in indicators were revealed in comparison with the baseline data. The results «before» and «after» the pedagogical experiment revealed that in almost all tests there are significant ($p \leq 0.05$) changes after the lessons, where the motor abilities of children were assessed, which are presented in table 2. Assessment of the results of vestibular stability using the stabilometric apparatus «Stabilan-01-2» revealed statistically ($p \leq 0.05$) significant improvements in the results, which are presented in Table 3. A decrease in deviation in the frontal and sagittal axes indicates an improvement in vestibular stability.

Besides, in children with general behavioral and mental disorders, the quality of the balance function increased by 33%. It is supposed that the improvement was due to the implementation of a block of exercises for coordination abilities.

Table 2. – Indicators of the development of physical qualities in children with general behavioral and mental disorders before and after the study, $M \pm \sigma$

Tests	Before research	After research
Running 30 meters in place (sec)	11,1±2,7	10,2±2,6*
Standing long jump (cm)	64,0±21,0	81,0±27,0*
Bench sit-up (number of times in 1 minute)	8,0±5,0	14,0±6,0*
Shuttle run 3 x 10 m (sec)	20,2±6,6	15,4±5,6*
Forward inclination of the body with straight legs (cm)	5,0±4,0	6,0±4,0*

Note: * - significant differences ($p < 0.05$) according to the T-Wilcoxon test

Table 3. – Indicators of vestibular stability in children with general behavioral disorders and mental disorders of primary school age before and after the study, $M \pm \sigma$

Plane (mm)	Before research	After research
Frontal plane	7,8±0,7	5,7±0,4*
Sagittal plane	-39,0±3,5	-36,0±3,1*

Note: * - significant differences ($p < 0.05$) according to the T-Wilcoxon test

Conclusion. Thus, the methodology for the development of motor abilities in the classroom for children with general behavioral and mental disorders was distinguished by the structuredness of means and methods using physical exercises and visual methodological cards. Systematic exercises had a positive effect on the development of conditioning abilities, vestibular stability, as well as voluntary attention, cognitive processes and communication skills.

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УДК 796.035-043.86

СОВРЕМЕННОЕ СОСТОЯНИЕ И ПЕРСПЕКТИВЫ РАЗВИТИЯ ОЗДОРОВИТЕЛЬНОЙ И АДАПТИВНОЙ ФИЗИЧЕСКОЙ КУЛЬТУРЫ, АДАПТИВНОГО СПОРТА

Е.А. Николаева, Н.В. Васецкая

Луганский государственный педагогический университет, г. Луганск

E-mail: nataly.sport@mail.ru

Аннотация. Статья посвящена изучению состояния и перспективе развития оздоровительной адаптивной физической культуры.

Ключевые слова: адаптивная физическая культура, спортивно-оздоровительный характер, здоровье.