

Pedagogical sciences

UDC 37.016:796.1

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## **DEVELOPMENT OF MOTOR COORDINATION OF JUNIOR SCHOOLCHILDREN WITH INCORRECT POSTURE**

**Summary.** *The article discloses the content of physical activity aimed at the development of coordination of movements in children of 7-10 years old with incorrect posture. Features of the choice of physical exercises taking into account the type of positional disorders, as well as the dosage of the parameters of the physical loads of the coordination orientation are described.*

**Key words:** *children aged 7-10 years, junior schoolchildren, incorrect posture, scoliotic posture, kyphotic posture, motor coordination, physical exercises.*

Recently, there has been a steady trend in the world to worsen the health of modern schoolchildren. Statistics show, that the number of Ukrainian children with chronic diseases increases 2.5 times during school life: about a third of students aged 7-10 already have various health disorders and no more than 20% of school leavers remain practically healthy [4].

In the structure of morbidity of schoolchildren, deviations in the development of posture occupy one of the leading places, and their positive dynamics with age is recorded [3]. Posture disorders cause a significant cosmetic defect; create the conditions for the emergence of diseases of the respiratory system, gastrointestinal tract, reducing the rate of physical development [9].

However, scientists have recorded that the vast majority of posture defects in primary school children has an unstable functional character and can be successfully corrected.

In children 7-10 years continue to actively form the musculoskeletal system, which increases the risk of disorders in the formation of physiological curves of the spine under the influence of various factors: hereditary constitutional features, individual development of motor function and irrationally organized motor activity. Therefore, one of the main tasks of physical education of pupils with postural disorders is the use of pedagogical influences on its correction by means of physical exercises [8]. Due to the constant use of precisely dosed tensions of the muscular corset on the basis of learning different coordination movements, the skills of maintaining physiologically correct torso positions in static postures and during movement - static and dynamic posture stereotypes are formed.

Posture stereotype is a component of motor function. Scientists have noticed that lag in the development of motor skills increases the risk of forming an incorrect motor stereotype of posture and, conversely, in children with posture defects there is a complication of the process of mastering motor skills, insufficient development of certain muscle groups, impaired balance and motor coordination [2, p. 19-20]. The formation of correct posture in children is mainly a pedagogical problem, so it is important to include in the content of motor activity of children with posture disorders physical exercises of special orientation, which is reduced not only to the flow to the affected area of the muscular system, but has a general developmental effect - increasing the functional capabilities of the body, the development of motor skills and the restoration of normal adaptive reactions of the child's body [7]. There are limitations in physical activity due to possible mechanical injuries of the spine (shocks, falls), concussions, burdens and possible deformations of the back and pelvis (deep jumps, support jumps, lifting heavy objects from a standing position,

performing complex acrobatic elements, etc.), and it is necessary to use carefully high-intensity exercises (running at a fast pace, relay races), physical exercises that strongly stretch the musculoskeletal system (hanging on bars, crossbeams) and increase excessive flexibility of the spine (elements of rhythmic gymnastics) [1, p. 28].

For pupils with deviations in the development of posture, special exercises are useful, designed to strengthen and stretch the muscles in a contracted or relaxed position, increase the mobility of the spine and motor coordination, which should be selected individually based on the type of disorder [5, p. 53].

Along with sufficient elaboration of the problem of schoolchildren, posture formation, prevention and correction of its disorders by means of physical exercises, research on the peculiarities of motor function development of primary school children with deviations in posture development is not enough in modern pedagogical theory and practice. The question of the development of coordination abilities of students with developmental disabilities remains open. Therefore, the purpose of our study is to determine the content of exercise for the development of motor coordination of junior schoolchildren with incorrect posture.

At typical posture disturbances it is possible to use the same exercises as in such cases disturbances of a muscular tone are similar. Physical exercises for the formation of posture, prevention and correction of its violations in the direction are divided into three groups:

- unloading of the spine: exercises to develop strength and endurance of muscles from the starting position lying on the abdomen and back, exercises on the gymnastic bench and gymnastic wall;
- activation of the motor structure of posture - the development of musculoskeletal sensitivity: exercises with objects on the head, exercises aimed at developing a sense of balance in different poses, balancing with objects and on limited support;
- prevention of negative environmental influences on posture and the

development of proprioceptive sensitivity: the use of an inclined plane: use of an inclined plane: walking on an inclined support, with an object on the head, with closed eyes.

A common feature of the main approaches to physical education of primary school children with deviations in posture development is the improvement of their physical development and motor skills [6]. Given that the formation of the correct motor stereotype of posture depends on muscle tone and coordination of symmetrical muscles of the torso, muscles that support the physiological curves of the spine, the development of motor coordination of primary school children is a necessary condition for consolidating physiologically correct torso positions stable posture and movement.

Motor coordination and posture are interrelated, as the mechanism of their development involves the same morphological, functional and psychophysiological indicators of the body. Peculiarities of the development of coordination of movements of primary school students with posture disorders are the accentuated influence primarily on the vestibular, motor and visual analyzers through a system of exercises aimed at controlling movements in space in static positions and during movement. The content of physical activity should be based on the principle of combined action on motor coordination and correction of muscle asymmetry, which consists in the variable application of physical activity associated with the reproduction of spatial, rhythmic, dynamic, plastic characteristics of static postures or movements. It is crucial for planning coordination exercises to take into account the age anatomical, physiological and mental characteristics of the development of the body of children of primary school age, the type of posture disorders and compliance with the methodological features of the development of coordination skills. Taking into account the age anatomical and physiological characteristics of children 7-10 years provides:

- ensuring the biological need for movement;

- combined development of coordination abilities and formation of motor organs - skeletal muscles, bones, tendons and ligaments;
- planning of adequate load parameters of the muscular apparatus;
- learning proper breathing during exercise.

Taking into account the mental characteristics of primary school children is based on:

- priority focus on the external features of the coordination exercise than on its semantic essence due to the visual nature of children's thinking, closely related to the activity of imagination (identification of poses and movements with animal behavior, manipulation of imaginary objects, use of figurative expressions in guidelines for performing exercises, etc.);

- obligatory combination of visual and verbal clarity, which consists in providing a quality display of the basic elements of movements and consolidating their perception with the help of figurative words, given that rhythmic, force and spatial parameters of movements students perceive primarily in their own feelings and generalized impressions;

- ensuring the playful nature of motor activity.

Differentiation of the content of physical activity is provided taking into account the type of posture disorder and related characteristics of the asymmetry of the spine, as well as the type of motor coordination. Adherence to the methodological features of the development of coordination skills is to take into account the sensitive periods of development of motor skills of children 7-10 years, the mechanisms of a particular type of motor coordination and factors which influencing its development, application of adequate methods and means of development of coordination abilities, selection of optimum parameters of physical activities.

Due to the fact that girls and boys of primary school age do not differ significantly in most indicators of motor coordination and body proportions, gender differentiation should take into account the most informative indicators of

coordination abilities of children aged 7-10 who have scoliotic or kyphotic posture. Thus, the study of the correlation between the type of posture disorder and motor coordination of children 7-10 years old showed that the content of coordination training of boys 1-4 grades with scoliotic posture should include physical exercises mainly for the development of coordination of movements and dynamic balance, coordination of movements and spatial orientation. For primary pupils with scoliotic posture – physical exercises for the development of static and dynamic balance, coordination of movements, girls of primary school age who have a kyphotic posture – physical exercises for the development of static balance, coordination of movements and spatial orientation. In the process of development of coordination abilities of schoolchildren with posture disorders in the construction of motor tasks it is necessary to take into account the following methodological provisions:

- taking into account the functionality of sensory systems (visual, auditory, motor, vestibular);
- active development of motor memory (based on learning movements of different coordination complexity;
- accentuated effect on intramuscular and intermuscular coordination; - combined development of conditioning abilities: flexibility, strength, speed and endurance.

In the process of developing motor coordination of children of primary school age with posture disorders, it is important to apply constant variation of exercises. First, it helps to learn new forms of movement, and secondly, improves motor memory, the stereotype of correct body position, motor perception. Particular attention in the development of motor coordination of schoolchildren with posture disorders is paid to learning proper breathing: when lifting the chest, inhale, and lower - exhale, during stress - inhale, during relaxation - exhale.

For the development of coordination abilities of junior schoolchildren with deviations in the development of posture use the methods of standard-repeated

exercise, variable exercise, game, their variations and combinations. The method of standard-repeated exercise is used in the process of applying motor tasks of increased coordination complexity by repeating them repeatedly in relatively standard conditions. The method of variable exercise is used in cases where the coordination exercise was of low complexity, but the emphasis was on improving motor sensations and perception by varying the individual characteristics, methods and conditions of the exercise. Thus, effective is: strict variation of individual parameters or the whole exercise (change of pace, amplitude, direction of movement, size or shape of the object, etc.); variation of the initial, intermediate or final position; variation or gradual complication of conditions or methods of performing the exercise; inclusion of additional movements or tasks. The application of the game method of development of coordination abilities provided specially directed mobile games, the content of which includes exercises for balance, spatial orientation, coordination of movements.

The best effect in the development of motor coordination occurs under the condition of optimal dosing of motor tasks. When planning motor tasks of coordination orientation for junior schoolchildren with posture disorders, such components of loads as complexity, intensity, duration of the exercise itself and the number of their repetitions, rest of the grass and its nature were taken into account (Table 1).

Thus, the complexity and intensity of coordination exercises depended on the conditions of their implementation. A wide range of coordination difficulties was used to develop motor coordination of junior schoolchildren with posture defects: 30-60% of the individually accessible level for optimal stimulation of sensory analyzers, activation of adaptive reactions of the neuromuscular system to new forms of movements and body positions.

Table 1

**Features of selection of components of coordination loadings for younger schoolchildren with incorrect posture**

Load components	Methodical features of load planning and direction of influence
Complexity of movements	Wide range of coordination complexity: 30-60% of the individually available level.
Intensity of muscle work	Gradual increase in intensity as the developmental effect accumulates. The intensity of a particular task depends on the type of coordination skills and performance conditions.
The duration of a single motor task or approach	Wide range from 1-5 seconds to 180 seconds depending on the coordination complexity and intensity of the motor task.
Number of repetitions	From 5 to 10 times for short-term work (1-5 seconds). Decrease the number of repetitions (up to 1-2 times) as the duration of the exercise and their total number.
Duration and nature of rest	From 30 s seconds to 2-3 minutes, depending on the duration and intensity of the load to the full restoration of efficiency and attention, as well as for the psychological mood. The nature of recreation - active, passive or combined.

The gradual increase in the intensity of motor tasks occurred as the formation of mechanisms of adaptation and growth of functional capabilities of the musculoskeletal and vestibular sensory systems of the body. The duration of a particular motor task or approach depended on the task. During the development of motor coordination, exercises lasting from 1-5 seconds to 180 seconds were used, depending on the complexity and intensity of the motor task, to ensure proper muscle regulation and quality performance of the exercise until obvious fatigue or decreased attention of children.

Since the development of coordination is associated with the use of a large number of different movements or changing the conditions and methods of their implementation to ensure the factor of novelty and unexpectedness, the number of repetitions was directly proportional to the total duration and number of exercises and chosen method of motor coordination. When planning the number of repetitions of coordination exercises were guided by the fact that the



improvement of motor sensation and perception of students using the method of standard-repeated exercise is achieved by repeating the same movements, and using the method of variable exercise - by varying individual characteristics of the motor task. Thus, when applying the method of standard-repeated exercise, the number of repetitions of a single exercise was planned from 5 to 10 times during short-term work (1-5 seconds), and as the duration of the exercise and their total number decreased the number of repetitions (up to 1-2 times) . When using the method of variable exercise, the number of repetitions of one motor task was low (1-2 times). The peculiarity of the game method is the lack of the possibility of strict dosing of loads. Therefore, when using coordination games, we planned only the total amount of time spent on the game, and focused on the emergence of emotional, coordination fatigue, decreased interest and attention to motor activity.

The duration of rest between individual exercises or approaches was planned from 30 seconds to 2-3 minutes, depending on the duration and intensity of the load to the full restoration of efficiency and attention, as well as for the psychological mood. If the rest interval is large, then its nature was active, if small - passive or combined. Active relaxation included exercises to relax muscles, corrective exercises, exercises to stretch muscles and increase mobility in the joints, which carried the main coordination load, breathing exercises.

Exercising different coordination structures for children gradually contributes to the formation of strength endurance of the muscles that hold the spine in an upright position. At the same time, the use of exercises for the development of other physical qualities (strength, speed, flexibility, endurance) to some extent helps to improve motor coordination of children.

So, the main idea of the method of development of motor coordination of children with incorrect posture is to focus primarily on vestibular, motor and visual analyzers through a system of exercises aimed at controlling movements in space in static positions and during movement. The content of physical activities

of coordination orientation is based on the principle of combined action on motor coordination and correction of muscular asymmetry, which consists in the variable application of physical activities associated with the reproduction of spatial, rhythmic, dynamic, plastic characteristics of static postures or movements. It is crucial to take into account the anatomical, physiological and mental features of the development of the body of children of primary school age, the type of posture disorders and compliance with the methodological features of the development of coordination skills. When planning motor tasks of coordination orientation for junior schoolchildren with posture disorders, it is necessary to take into account the complexity, intensity, duration of physical exercises, the number of their repetitions, the etching of rest and its nature.

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