

Therapeutic Physical culture as a Method of Rehabilitation of Preschool Children with Intellectual Disabilities

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ABSTRACT

The article is a theoretical justification and presentation of the results of testing the program of therapeutic physical culture as a means of rehabilitation of children with intellectual disabilities, provision of proofs of its effectiveness. To obtain objective data in solving the tasks, the following research methods were used: theoretical analysis and generalization of data of psychological, pedagogical and medical literature, observation, experiment, comparison, methods of mathematical processing. We have created an educational and methodical complex, which includes a system of correctional work with children of preschool age 5–6 years with intellectual disabilities; systematized various areas of correctional and developmental work in classes of adaptive physical culture, which helps to improve the quality of life in preschool children 5–6 years with intellectual disabilities. The application of the program of therapeutic physical culture in the rehabilitation process of preschool children with intellectual disabilities had improved the motor activity of children, developed the ability of self-control, ability to follow the instructions of the teacher, to act together, to manage the emotional state and to respond to external signals.

Key words: Intellectual disability, Physical culture, Physical activity, Rehabilitation, Therapeutic physical culture

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INTRODUCTION

Recently, in modern society there is a tendency to increase the birth of children with intellectual disabilities, which is influenced by several factors: infections, radiation, hypoxia of the brain, hereditary metabolic disorders, chromosomal diseases, incompatibility of mother and foetus, birth injuries, etc. Society needs to create rehabilitation programs based on the approaches of humane rehabilitation philosophy, culture of dignity and equality of rights.

A child with an intellectual disability, according to international approaches and standards, is considered a person who has the same rights as other members of the community, but due to the peculiarities of individual development it is necessary to provide special educational services for such child. Thanks to modern comprehensive

care, they have positive changes in the personal-motivational, cognitive, and emotional-volitional sphere. Only under the condition of early inclusion in the system of rehabilitation work of the specified category of children it is possible to reach an optimum level of their development. These aspects led to the creation of a program of therapeutic physical culture for the rehabilitation of preschool children with intellectual disability. The authors of the program focused on physical culture because the violation of intelligence is expressed not only in the reduction of cognitive functions of the child, but also is the cause of abnormal development of its motor sphere. In turn, physical education classes contribute to strengthening the health and physical fitness of the child; correction of deficiencies in their mental and physical development; education of moral and volitional qualities, preparation for independent living and socially useful work. Exercise has a tonic effect and stimulates motor-visceral reflexes. They accelerate metabolic processes in tissues, activation of humoral processes. Appropriate selection of exercises allows you to selectively affect the motor-vascular, motor-cardinal, motor-

pulmonary, motor-gastrointestinal, and other reflexes, which allows to increase the tone of those systems and organs in which it is reduced [1-3].

Exercise helps to normalize acid-base balance, vascular tone, metabolism of injured tissues and sleep. They mobilize the protective forces of the child's body and promote reparative regeneration of damaged tissues [1,4].

In order to create a program of therapeutic physical culture as a means of rehabilitation, we conducted a theoretical analysis of the problem of using physical exercises in the rehabilitation process, which showed that scientists consider this problem in the following areas: structure, nature, objectives and content of physical education; the role of physical education in correcting the shortcomings of psychophysical development; features of physical vocational education of mentally retarded students; the impact of physical education on the formation of the necessary social skills, abilities and many positive character traits; opportunities for physical exercises in the rehabilitation process.

Among the important scientific works devoted to the problem of rehabilitation, the guidelines in the development of the program were works that explain various aspects of physical rehabilitation.

So, focusing on the scientific views of previous research, who determined physical education and sports as the most effective means of rehabilitation [5], we selected appropriate physical exercises and moving games for children with intellectual disabilities. Also, to create a program of therapeutic physical culture, the experience of scientist S. Popov was analysed detail. He considered physical rehabilitation as the main component of medical rehabilitation, which uses the means and methods of physical culture, massage, and various physical factors. The author emphasizes that physical rehabilitation should be considered as a medical-pedagogical and educational process, or, better, an educational process [6].

In determining the principles of implementation of the program of therapeutic physical culture, we based our work on the studies of famous researchers in the field of social pedagogy. Scientists consider rehabilitation as a dynamic continuous process, the basis of which is the balance between the existing needs of the individual and the ability to meet them, which is a mechanism for increasing the activity of the individual [7].

The provisions of child and age psychology were key in creating a system of therapeutic physical culture. Thus, when organizing the education of children with intellectual disabilities, we consider an important pattern of their mental development, namely the spontaneity of the formation of mental processes, that is, the presence of self-promotion, where each stage of mental development follows the previous one, and the transition from one stage to another is determined not only by social but also internal reasons. In turn, the motor activity of the child has a certain relationship with its

intellectual development. More active children have better intellectual and physical development compared to less active ones.

The autonomic functions of the child's body and its musculoskeletal system are also closely related. Movements stimulate various vital processes, have a positive effect on their formation. In turn, autonomic functions provide tissues, internal organs with nutrients and oxygen.

Thus, hypodynamic, which occurs in children with intellectual disabilities, can cause not only a lag in the formation of psychomotor skills, but also lead to a delay in the development of their autonomic functions.

Previous research shows that the progress of the child's brain functions is largely determined by the progress in the development of the motor analyser. To improve the functions of higher nervous activity we require not only a variety of environmental influences (extra reception), but also a constant influx of tonic proprioceptive impulse, which arises because of psychomotor activity [8,9].

Based on this, intellectual disability is defined by us as the result of delayed or incomplete development of consciousness, in which the abilities that form a sufficient level of intelligence. Cognitive, linguistic, motor, and social abilities are particularly impaired.

When planning and organizing the physical rehabilitation of children with intellectual disabilities in the selection of physical exercises, games, entertainment, we adhered to certain requirements, such as: physical exercises were chosen of small and medium degree of intensity, corrective direction and taking into account the principle of diversity and attractiveness, that is, different exercises in terms of content and nature of performance, for different muscle groups, which were performed with interest by children.

The content of the program of therapeutic physical culture is designed for children with mild and moderate degrees of mental retardation. Mild degree – F70 (mild mental sub normality, mild oligophrenia, dementia). Using standard tests to determine the IQ for mild mental retardation is in the range from 70 to 50 units (in contrast to normal development, which averages 100–115 units) [10].

Moderate degree of mental retardation – F71 (moderate mental sub normality, moderate oligophrenia, imbecility). The IQ for standard tests for this group is in the range from 49 to 35 units. Moderate mental retardation is an average degree of mental retardation, characterized by unformed cognitive processes. The thinking of such children is concrete, inconsistent, inert and, as a rule, incapable of forming abstract concepts [10-12].

MATERIALS AND METHODS

The aim of the study is to program of therapeutic physical culture we have identified to improve the quality of life of a child with intellectual disabilities.

We conducted a study in 2020–2021 based on the rehabilitation centre «Sunflower» in Poltava. It was attended by 12 children with mild and moderate intellectual disabilities.

The empirical study was performed in three stages.

1st stage–Study of the initial potential of children, meaning evaluation of the level of formation of skills to perform physical exercises under the instructions of an adult and independently.

2nd stage–Development and implementation of a program of therapeutic physical culture.

3rd stage–Control monitoring of the effectiveness of therapeutic physical culture for children 5–6 years with mild to moderate mental retardation; processing and systematization of the obtained results.

The research methodology is based on the principles of humanistic philosophy; understanding of the individual as an active subject of development and activity; conceptual provisions of psychological and pedagogical and socio-pedagogical science on the formation of personality in the unity of spiritual, mental, and physical aspects; on the provisions of positive psychology and its methods. To obtain objective data in solving the tasks, the following research methods were used: theoretical analysis and generalization of data of psychological, pedagogical and medical literature, observation, experiment, comparison, methods of mathematical processing.

RESULTS AND DISCUSSION

At the first stage of the study, children were observed during the classes planned by the teacher, free activities, in the process of conducting mobile games indoors and outdoors, on the actions of children in cultural events with the help of individual monitoring. The main parameters of observation were:

- The ability of the child to control their motor activity.
- The ability to act on the instructions of an adult.
- Ability to accept rules in all activities.
- Ability to perform actions according to the pattern.
- Ability to perform complex motor actions under the guidance of a teacher.

For the convenience of recording the results of each child’s activities, we have developed a scale of universal assessment system.

0 points-The child does not accept the proposed instructions and does not perform the task.

Table 1: Levels of ability to act in accordance with the instructions in preschool children with mild to moderate mental retardation (initial parameters).

Development level	Number of children	Percentage %
Low	4	33.3 %
Below average	8	66.6 %

1 point-The child shows interest in tasks, performs them by imitation.

3 points-The child performs a variety of exercises and movements, using a sample demonstrated by an adult, but subject to a slow change of tasks.

4 points-The child performs various exercises or movements based on the model displayed by an adult or based on verbal instructions, uses tasks in various activities (in everyday life), under the control of an adult.

Based on the calculation of the total amount of points, we have identified the following levels of life skills.

Low level: After repeated instructions and demonstration of various exercises and movements, the child does not understand and does not perform the proposed tasks.

Level below average: Children have access only to the visual correlation of tasks under strict control by the teacher. The instruction is either not perceived or poorly understood by the children, or they start to perform the task before getting acquainted with it. This requires multiple demonstrations of how to perform these exercises and movements. Mostly children perform tasks imitating an adult. At the same time inadequate actions from the child can come to light.

Average level: Children not only visually correlate tasks, but in some cases can perform the proposed exercises and movements according to the verbal instructions of an adult. To better understand the instructions, the child needs to repetition or reinforcement by demonstration.

Above average level: Children are able and willing to perform a variety of exercises and movements according to the verbal instructions of an adult. The instruction is understood correctly, but, in some cases, it needs to be repeated.

High level: Children recognize, but in some cases independently name this exercise or movement. The peculiarity is that children correctly understand the proposed instruction, although in some cases it needs to be repeated. The proposed tasks are performed by children according to the verbal instructions of an adult.

The results of the examination of pupils are recorded in the diagnostic development card.

From the obtained data we can see that most children (8 people) in the study group are below average (Table 1). Four children have a low level.

Average	0	0 %
Above average	0	0 %
High	0	0 %
Total number	12	100 %

In the second stage of the study, we divided the children into experimental (EG) and control groups (CG) of 6 people. In the experimental group, we proposed a program of therapeutic physical culture, and in the

control group classes were unchanged. The content of the program includes the following sections, which are presented in Table 2.

Table 2: Program sections.

No	Section name
1	Formation exercises
2	Athletics
	Walking
	Running
	Jumping
	Throwing (rolling or throwing the ball)
	Crawling, climbing
3	Gymnastics
	General developmental exercises
4	Development of general physical fitness
	Acrobatics
	Ski training
	Action games

Classes are held in the gym, sports ground, ski training is conducted in a specially designated place. The section of formation exercises includes tasks of construction and reconstruction, it allows to bring up at children collective actions, to develop sense of a rhythm, pace, discipline, and organization. Also, tasks on formation exercises allow to develop at the child ability to carry out the requirement of the teacher, coordination of actions in joint activity. This section includes the following tasks: construction in one row, construction in one column, construction in a circle (following the teacher, while holding hands), rearrangement in two rows, construction of pairs and their breakdown are carried out. Children learn what is length, width, expands vocabulary, develops memory and observation.

The athletics section includes basic movements: walking, running, jumping, throwing, crawling, and climbing. This section is most important for children with movement disorders. These movements are aimed at the comprehensive development of the child. They strengthen and develop the muscles of the whole body, develop the cardiovascular and respiratory systems, coordination skills, as well as body motility. This section includes the following tasks: walking on toes, walking on heels, walking backwards, walking with a stop at the signal, walking between objects and stepping over

objects (sticks, cubes, balls), walking with various hand movements (behind the head, in front of the chest, on the waist, behind the back, etc.) and walking with alternation with running. Running on toes, running with a high rise of the thigh, running along the line, running with a change of direction on the signal, running between objects, running race, running with objects, etc. Jumps on a place up on one and two legs, jumps with advancement in a column and a line, jumps between objects, jumping balls and cubes, jumping off a bench, throwing balls and sandbags forward, throwing in the hoop with his right and left hand, throwing the ball to the floor and catching it, rolling balls in pairs with one or two hands, rolling the ball in a straight line, throwing the ball with two hands with an adult, throwing the ball in pairs from the chest, throwing the ball over the head, etc. Crawling in a straight line, between objects, crawling on a moving object, climbing on a gymnastic wall up 4–5 beams with the help of an adult.

The section on gymnastics includes complexes of exercises which are directed on development and formation of the musculoskeletal system, mobility of joints, the correct posture, strengthening of muscles of a body. General developmental exercises should be dosed and performed in different variants and combinations. Simple exercises for the following parts of the body were

used: exercises for arms and shoulder girdle, exercises for torso and neck and exercises for legs. These exercises are aimed at the development of motor skills and abilities, namely strength, flexibility, agility, speed, coordination of movements and balance, orientation in space and time; on the development of the properties of the psyche, namely attention, intelligence, discipline, memory; to increase the functional level of body systems: exercises to train the respiratory, cardiovascular, and other systems. General developmental exercises are conducted with objects and without objects, are carried out in a circle, in rows, in columns or in pairs. Each exercise is shown by the teacher and accompanied by clear instructions. During the exercises, the teacher corrects existing errors.

The section of acrobatics influences full-fledged formation of the child, in the course of its employment dexterity, flexibility, balance and accuracy of movements are developed. During classes purposefulness and discipline are formed, and also self-regulation in movements and motor acts are developed. The ability to cooperate with each other and to follow the rules set by the teacher when teaching exercises of this category (rolling back and forth, standing on one leg, bridge, etc.) are formed.

The section on ski training develops the child, and also has a huge influence on hardening of an organism and physical development. When working on skis, spatial orientation, coordination of movements and posture develops, and all muscle groups are strengthened. Classes on ski training are educational in nature, the ability to hear the teacher as a child and comply with his requirements. This section contains the following tasks: construction with skis in one row, teach to dress and take off skis, move with skis to a place of employment, to carry out standing of children on skis, crossing on skis to the right and to the left, to teach movement by a sliding step.

The section of action games is aimed at developing skills in basic movements (walking, running, jumping, crawling, climbing). Action games promote the development of arbitrary self-regulation in the child, which is manifested in obedience to the rules and their strict observance. Rules in the game regulate the behaviour of children, develop discipline, teach children to be responsible for their actions, develop social skills and collectivism. Execution of various game roles and situations promotes development at children of this category of language, speed of thinking, cleverness and improvement of psychic and emotional background. For children with mild to moderate mental retardation, plot games and

game tasks are used, where the main attention is paid to achieving a specific goal. Games should be diverse, when learning a new game, much attention is paid to learning the rules, which can be simplified at the initial stage, and then gradually complicate. The following games can be used for children in this category: «Run to me», «Bring a toy», «Find your house», «Mice and cat», «Roll the ball», «Steps over the stick», «My merry, ringing ball», «Find an object», «We are fun guys», «Ball in a circle», «Aim better» etc.

All the above-mentioned exercises and tasks are carried out by the teacher considering the limited health of children and taking into account individual characteristics, i.e., the exercises are selected so that the child can cope with the task. The classes use a comprehensive approach, which leads to the development of not only physical but also cognitive interest, as well as the formation of children's skills in arbitrary self-regulation. These tasks, exercises and games give a serious impetus to the development of brain activity in children, and consequently all mental processes, such as perception, memory, attention, thinking, intelligence, discipline, etc. We can say that classes on adaptive physical culture according to the program developed by us develop and form in a child with special educational needs independence and affect self-development. This means that an adult helps a special child to use the knowledge gained through their own experience.

Classes are held in groups, twice a week. The duration of one lesson is 25–30 minutes. The program is designed to last for 1 year.

At the third stage of the study, we summarized and concluded the effectiveness of the use of the program of therapeutic physical culture in the rehabilitation process of preschool children with intellectual disabilities. The effectiveness of the program was determined by the method of «zero cut». The results are presented in Table 3.

The data obtained in the diagnostic study of children participating in the formative experiment, allowed to determine that the control group was dominated by the level of quality of life below average (4 children), low level had 1 child and medium level had 1 child, high level was not registered. Whereas in the experimental group the level of development was much higher: no child was found at low level, 4 children were found below average, 2 children were found at average level, above average level and high level was not detected.

Table 3: Levels of ability to act in accordance with the instructions in preschool children with mild to moderate mental retardation after the experiment.

Development level	Number of children	
	CG	EG
low	1	0
below average	4	4

average	1	2
above average	0	0
high	0	0
total number	6	6

We also analysed the dynamics of individual changes of each child, the results of which are presented in Figure 1.

According to the data presented in Figure 1, in the experimental group significantly improved individual indicators for each criterion. We note an increase in the ability of each child to successfully complete tasks, pupils more successfully began to control their motor activity, i.e., to have self-regulation, in the situation of choice give preference to those actions that comply with the instructions of the adult. Children perform complex motor actions imitating the teacher; try to restrain their impulsive movements; seek to use the example of an adult in performing various exercises and tasks; show a steady interest in performing various motor actions; play different games with the help of a teacher; respond to sound and other signals that the teacher uses in class, as well as meet the requirements of the teacher to organize classes. Some observations of teachers in the experimental group also show positive changes in the behaviour of children not only in physical education, but also in other types of daily activities.

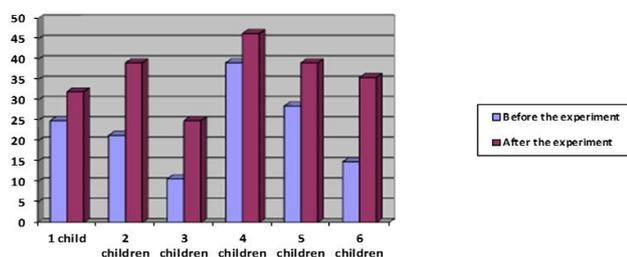


Figure 1: Dynamics of changes in motor activity of children (experimental group).

CONCLUSIONS

The use of the program of therapeutic physical culture in the rehabilitation process of preschool children with intellectual disabilities has a positive effect on motor activity, memory, thinking and coordination. Children become more flexible psychologically, there are skills of self-control and action according to the rules. Of course, such changes have been achieved over a long period of time. This is since in children with intellectual disabilities all processes are much slower, later formed random memory, there is a slow pace of learning new, short storage and inaccuracy of reproduction of motor actions. Due to the peculiarities of the central nervous system, they are very easily distracted, unable to concentrate for a long time, have increased suggestibility and seek to avoid responsibility. However, the positive dynamics of change indicates the possibility and need for targeted correction of deviations from the norm.

The issues of stabilization of the achieved results need further study methods, forms of preparation of parents of the specified category of children for a sports way of life.

REFERENCES

1. Basilova TA. Education and training of preschool children with complex and multiple disabilities. Special preschool pedagogy: Study guide. Moscow 2001; 360.
2. Borshchagovskaya T. Theatrical games as a means of developing the creative abilities of preschoolers. Teacher's palette 2013; 21.
3. Zhigoreva MV. Children with complex developmental disabilities : pedagogical assistance: Study guide for university students. Moscow 2006; 240.
4. Alekseeva I., Kalmykova M. Hyperactive children: behavior correction. Kyiv 2011; 96.
5. Vovkanich AS, Trach VM, Tupaylo GV. Training program for rehabilitation specialists. Disability and society: Problems of integration. Kyiv 1995; 38.
6. Popov SN. Physical rehabilitation: A textbook for students of higher educational institutions studying according to the State educational standard. Physical culture for people with disabilities (Adaptive Physical education). Rostov-on-Don 2005; 608.
7. Koval L. G. Socio-pedagogical support of children with various social and physical anomalies. Social Pedagogy Kyiv 1997; 157-164.
8. Babushkina RL, Kislyakova OM. Speech therapy rhythm: Methodology for working with preschoolers suffering from general speech underdevelopment. Edited by Volkova GA. St. Petersburg 2005.
9. Boryak OV. Methods of speech therapy examination of mentally retarded children of senior preschool and primary school age. Theoretical and methodological aspects of correctional and rehabilitation activities: Monograph. Sumy 2015; 133-152.
10. Artemova LV. Theater and play (At home, in kindergarten, at school). Kyiv 2002; 291.
11. Bondar VI. Didactic and socio-pedagogical aspects of the development of special education for children with mental and physical disabilities. Development of pedagogical and psychological sciences in Ukraine 1992-2002. Collection of scientific works to the 10th anniversary of APS of Ukraine/APS of Ukraine. Part 1. Kharkiv 2012; 613-630.
12. Ovcharuk OV. Development of a competency-based approach: Strategic guidelines of the international community. Competence approach in modern education: World experience and Ukrainian perspectives. Kyiv 2014; 53-58.