

## Effect of motion games on the psychoemotional state of children with intellectual disabilities

TETIANA KRUTSEVICH<sup>1</sup>, NATALIA PANHELOVA<sup>2</sup>, KUZNETSOVA LARYSA<sup>3</sup>, OKSANA MARCHENKO<sup>4</sup>, SERGII TRACHUK<sup>5</sup>, MARIIA PANHELOVA<sup>6</sup>, BORIS PANHELOV<sup>7</sup>  
1,3,4,5 National University of Physical Education and Sport of Ukraine, Kiev, UKRAINE  
2,6,7 Pereiaslav-Khmel'nitsky Hryhorii Scovoroda State Pedagogical University, Pereiaslav-Khmel'nitsky, UKRAINE

Published online: March 31, 2020

(Accepted for publication: March 19, 2020)

DOI:10.7752/jpes.2020.02123

### Abstract:

*Purpose:* The aim of study was to examine the features of emotional state and cognitive function of children with limited intellectual abilities during outdoor games. *Methods:* 40 pupils from the Smilyan Orphanage of Cherkasy Region participated in the research. All children were divided into two groups, the control and the experimental, with the existing diagnosis of moderate grade oligophrenia, and attended the 2nd and 3rd grades of correctional school. The control group consisted of 22 students, including 11 boys and 11 girls. The experimental group consisted of 18 students, of which 9 boys and 9 girls. The following research methods were used: analysis and generalization of the data of special scientific literature, pedagogical methods of research, method of comparison, methods of research of psycho-emotional state; psychomotor development; methods of mathematical statistics. *Results:* The results of researches presented in the article allow to state the positive influence of classes of motive games on the psycho-emotional state and cognitive function of children with intellectual disabilities, which will promote social adaptation of students with this nosology. **Conclusions:** Motivational games can be used during developmental and physical training sessions as an effective remedy for therapeutic effects in some mental disorders, as an effective non-medication remedy. This has a positive effect on the physical and psycho-emotional state of children with intellectual disabilities and can be applied in the process of adaptive physical education.

**Key words:** active games, junior schoolchildren, emotional status, cognitive function.

### Introduction.

Mental disorders are one of the major public health problems in the WHO European Region, affecting 25% of the population each year. Therefore, the WHO European Region is facing a variety of problems affecting the well-being of the population, providing quality assistance to people with mental health disorders (World Health Organization, 2015).

The current legislation of Ukraine in the field of education provides the legal basis for the further development of the education system in terms of creating conditions for learning, rehabilitation, social adaptation, integration of children with special needs into society (Viskovatova, 2012; Imas, Dutchak, Trachuk, 2013; Moskalenko, et al. 2014).

Mental retardation is defined as a feature of the development of the psyche of the child with organic damage to the central nervous system in the prenatal period or in the period from 1 to 3 years.

Research by a number of authors (Fedoseeva, 2012; Kuznetsova, 2014; Gayash, 2015) in children with intellectual disabilities does not have a sufficiently developed ability to control and self-control their own behavior, which is a consequence of the violation of the relationship between cognitive and emotional processes, or thinking and emotions. The child has a low level of activity and cognition, its immediate needs and emotional manifestations are not subordinate to thinking and, therefore, are not understood and regulated by the child itself.

A child with intellectual disabilities has an inherent affectiveness that can manifest itself in turbulent emotions that are unstable, short-lived, and change rapidly from positive to negative and vice versa. It is quite easy to frighten a child with comments, but with the same ease, in the form of a positive appeal, one can be interested in and cause pleasure and joy (Yudilevich, 1981; Martin Kudláček, et al., 2016).

Children with this nosology characteristic expression of emotions like: aggression, anxiety, concern, excitement, joy, expressly, directly in behavior. Behavioral actions can have the nature of whims, non-compliance with the requirements of an adult, aggressive, sometimes harmful actions. It should be remembered that such behaviors are not consciously understood by the child; therefore, they express their feelings directly (Yurovsky, 1985; Mersyanova, et al., 2013; Syriopoulou-Delli, Cassimos & Polychronopoulou, 2016).

The variety of variations in health status, limited adaptive capacity, infringement of coordination skills, low levels of physical development and physical performance, low emotional life of children with abnormal mental development requires special attention in setting objectives adaptive physical education since it is from primary school age (Lesko, 2004; Kuznetsova, 2014; Todd & Reid, 2006).

Given that children with disabilities typically have physical activity 4.5 times less than their peers without disabilities (Rimmer, 2008), and only about 24% of children with disabilities meet current guidelines for physical activity (Downs, Fairclough, Knowles, & Boddy, 2016), physical activity promotion should be considered one of the main goals of adaptive physical education. (Considering that children with disabilities typically engage in physical activity 4.5 times less than their peers without disabilities (Rimmer, 2008), and only approximately 24% of children with an intellectual disability meet the current physical activity guidelines, promoting physical activity should be considered one of the main goals of adaptive physical education (APE) (Downs, Fairclough, Knowles, & Boddy, 2016).

With the help of specially selected means and methods of adaptive physical education it is possible to solve not only the problem of improving the health of children with intellectual disabilities, to increase their level of physical fitness and physical development, but also to increase the level of mental capacity, which positively reflects on the efficiency of all correctional work in as a whole (Pelyh, 2011; Baikina, 2014).

The analysis of the scientific and methodological literature shows that the authors pay much attention to the study of the problem of organizing the classes of adaptive physical education of children with intellectual disabilities and the influence of different types of physical activity, namely: swimming, elements of athletics, basketball, volleyball, table tennis, gymnastics (Kozlenko, 1985; Mozhovoy, Dmitriev, Samylichev, 1996; Hammeken, 2000; Glazyrin, 2006, Krutsevich, 2017).

Whitebread, Neale, Jensen, et.al. (2017) the role of play in the development of children is presented through evidence base: physically active play gives children further health benefits; there is ample evidence linking various types of motion games to academic progress and cognitive self-regulation, as well as to social competence.

To date, there are virtually no studies that scientifically substantiate the effectiveness and impact of precisely moving games on social adaptation, improving the cognitive function of young school-age children with intellectual disabilities.

### **Materials and Methods.**

The purpose of our work was to study the effectiveness of the impact of motion games on the cognitive function of children with intellectual disabilities.

40 pupils from the Smilyan Orphanage of Cherkasy Region participated in the research. All children were divided into two groups - control and experimental with the existing diagnosis of "moderate degree oligophrenia" and studied in grades 2 and 3. The control group consisted of 22 students, including 11 boys and 11 girls. The experimental group consisted of 18 students, of which 9 boys and 9 girls. The following research methods were used: analysis and generalization of the data of special scientific literature, pedagogical methods of research, method of comparison, methods of research of psycho-emotional state; psychomotor development; methods of mathematical statistics.

The pedagogical experiment was conducted during the school year (for 10 months). The experiments in the experimental group were constructed in such a way that, in the content of the lesson, special exercises and moving games aimed at social adaptation of children with intellectual disabilities were conducted. The control group in the class worked on the standard program and accordingly the planning of the material. The children who participated in the research were under the constant supervision of a doctor, pediatrician and teacher directly.

### **Results.**

It is known that the correct selection of motion games taking into account the child's psychophysical state allows to improve not only the motor qualities that are most actively manifested and improved during the conduct of motion games, but also to improve the emotional background, mood, stimulating active mental activity.

Technology for running games should include:

- selection of mobile games;
- development and evaluation of technology implementation opportunities;
- assessment of the physical condition of younger students with intellectual disabilities;
- conducting mobile games in defined and extracurricular forms of classes;
- technology evaluation criteria;
- determining the effectiveness of mobile games technology.

To improve the process of adaptive physical education, it is proposed to use mobile games of different orientation, content, intensity, in different places: in the open air, indoors, using different means of physical education (physical exercises, motor mode, hardening).

During the running game the developed stages of the running game should be applied: statement of problem situation; work with the task; start of game activity; result.

Running games should be carried out according to stages (Fig.1)

As a result of the analysis of literary sources, previous practical experience and the results of our own research, we have determined the criteria for the successful conduct of mobile games for children with this nosology : game accessibility, Interesting and simple plot, phased learning, individual approach, use of available equipment and equipment, level of pedagogical mastery of the teacher, knowledge of the peculiarities of the psychophysical state of the participants.

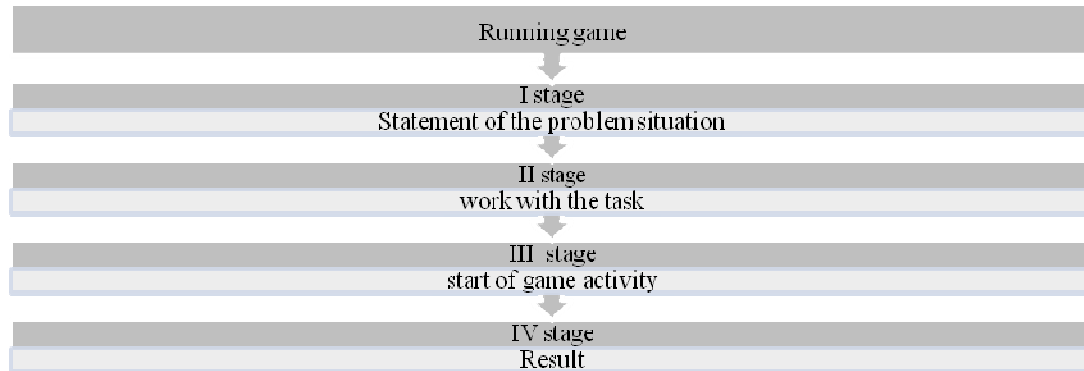


Fig.1 Stages of holding mobile games

Fulfilling the above conditions will help to avoid mistakes while running games and increase their effectiveness.

When working with children with intellectual disabilities, it is necessary to carry out mobile games according to the developed categories aimed at social adaptation.

Systematization of motion games in the process of adaptive physical education of children with moderate mental retardation is presented by Kuznetsova (2014) and aims at social adaptation of children in the environment where, depending on thematic tasks and psycho-emotional influence, categories and pedagogical tasks are allocated (Fig.2).

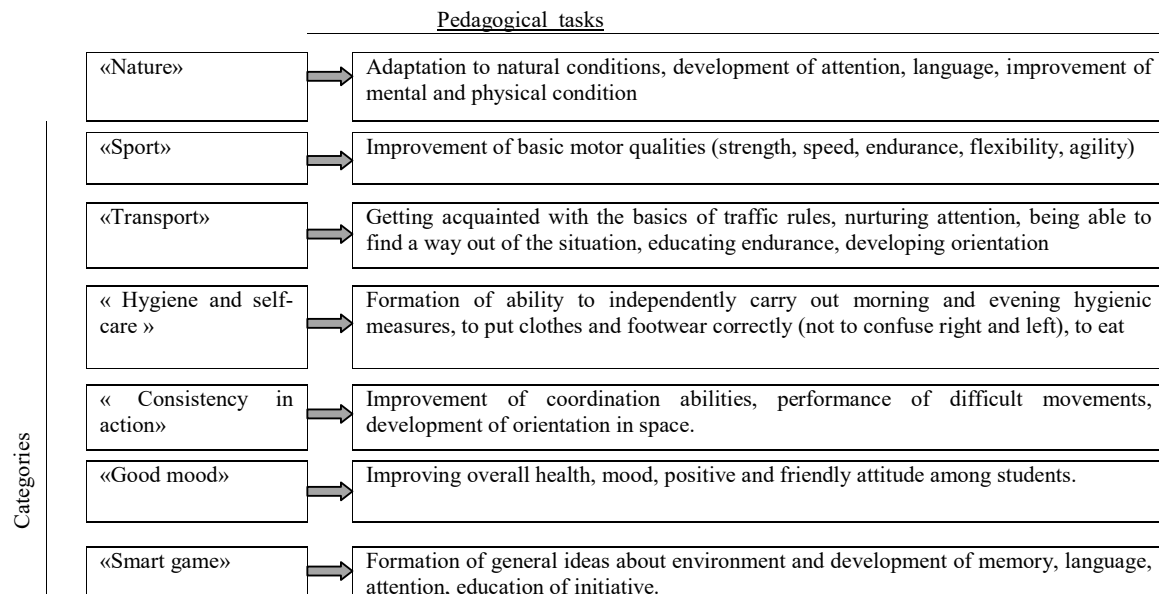


Fig.2 Distribution of games by categories and pedagogical tasks that promote the socialization of children with intellectual disabilities

We suggest applying the categories of games we have developed:

"Nature" - during the walks and excursions to accompany comments on the surrounding territories and objects that are within sight of students with intellectual disabilities. For example: Pigeons, Bunnies, Wolf and Goats, Fox and Chickens, Flowers and Wind. During the walk or excursion and after.

"Sport" - in physical education lessons (in the main and final parts for 7-10 minutes), during walks (at the request of children). For example: for the development of the force "Tugs in pairs", "Boar fat"; for development of speed-power qualities "Fight for the ball", "Pass in a circle"; for speed development "Bees on the meadow", "Bird in the nest", "The sea is worried"; for the development of "Golden Gate", "Succeed", "Run through the hoop" agility; to develop the flexibility of "Reach for the subject", "Corners", "Acrobats". Posture prevention games are recommended to be used in all lesson and non-lesson forms within 3-5 minutes: "Walk in a circle", "Footpath", "Through a jump jump", "Planes" and others.

"Transport" - to carry out during walks and excursions outside the territory of the educational institution with a real demonstration of different types of transport, traffic lights, highways, sidewalks, observing pedestrian behavior. For example: "Train", "Wheelchair Racing", "Tractors", "Fast cars" and others.

"Hygiene and self-care" - spend during general education lessons, during breaks, during the morning and evening toilet, on walks. For example: "Wash to holes", "Quick boots", "Wear gloves", "Whose hat".

"Hygiene and self-care" - spend during general education lessons, during breaks, during the morning and evening toilet, on walks. For example: "Wash to holes", "Quick boots", "Wear gloves", "Whose hat".

"Good mood". Games in this category should be conducted in physical education classes, general education lessons (as needed), walks and excursions, outdoors and indoors. For example: "Dwarfs and giants", "Bells", "From coast to coast". Duration of games according to the mood and wishes of children.

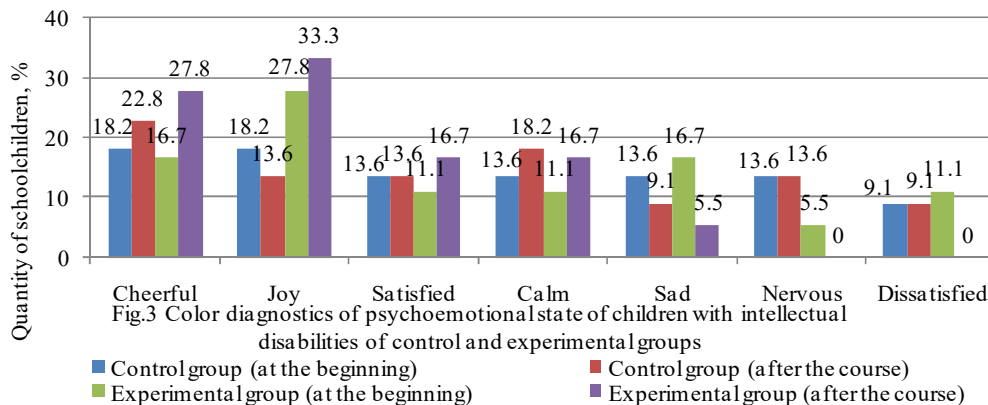
"Smart game" - to spend in physical education lessons, during general education lessons, walks, speech therapy (for 5-7 minutes). In the main and final parts of the lesson). For example: "Go fast-care, don't yell", "Santa Mazai", "Polar bear".

An important point is the constant medical and pedagogical control over the activities of children with intellectual disabilities during running games, as well as other types of physical activity, in order to avoid injuries and exacerbation of mental states. It is this type of control that is given more importance than in the physical education of healthy children, and thanks to this type of control it is possible to estimate the degree of influence of the process of adaptive physical education on the body of a sick child (minor, moderate, significant and excessive).

It is necessary to conduct mobile games within the framework of this technology, in physical education lessons 2 times a week for 5-6 games of different intensity. Two to five minutes long. At general lessons daily, at breaks, during physical minutes, during walks and excursions, at logopedic and therapeutic physical education classes.

In order to diagnose mood as an emotional state of the students, we used the emotional-color analogy technique proposed by Lutoshkin (1988); it consists of eight colors: red - captured; orange - joyful; yellow - nice; green - calm, balanced; blue - sad; purple - disturbing; black is extremely unsatisfactory; white - hard to define, neutral. Starting in the use of color in research operations is established in the color psychology of the relationship of certain color shades of various forms of manifestation of the emotional state of man. In color psychology there is a difference between cold and warm, active and passive, light and heavy colors, depending on the peculiarities of perception by their person.

Figure 3 presents the color diagnostics of the emotional state and cognitive function of children in the control and experimental groups in dynamics.



Analysis of the emotional state of students in the control group attending physical education classes with traditional content, suggests that 50 % of children found a cheerful, active and joyful mood, the number of children does not change even in repeated studies. The dynamics are observed with a state of rest and anxiety,

however, this is only 4.5 %. We can conclude that relatively stable indicators in children, which characterize the emotional state and affect cognitive function under the influence of classes with a traditional basis are supportive.

We also investigated the emotional state of children in the experimental group after a course of predominantly using motion games.

55.6 % of children showed a cheerful, active and joyful mood before the start of the game, and after playing games, we observed the same mood in 77.8 % of students, which implies that the children wanted to play, they liked to take participation in this motor activity.

Positive dynamics are also observed in the following states, including 16.7 % of children, the state of anxiety is reduced by 11.1 %, and children with anxiety and dissatisfaction after the course of play with orientation have not been observed at all.

Table 1 presents the indicators of mental state of children before and after the experiment in the control and experimental groups.

The mobility games we selected had a positive effect on the emotional state of both boys and girls with intellectual disabilities, especially those who were more involved in play activities, that is, students in the experimental group. Thus, indicators of visual thinking in experimental group (EG) in both boys and girls increased by 50-55 %, respectively, while in control group (CG) by 29.7 and 30.9 % ( $p < 0.05$ ).

Table 1. Indicators of visual thinking and short-term memory before and after the experiment of students with intellectual disabilities (score)

| sex   | group     |   | Visual thinking<br>"Build a house" test |       |             | Short-term memory<br>test «5 subjects» |       |             |
|-------|-----------|---|---|-------|-------------|--|-------|-------------|
|       |           |   | before                                  | after | Increase, % | before                                 | after | increase, % |
| boys  | EG (n=9)  | — | 1,31                                    | 2,11* | 50          | 2,56                                   | 4,0*  | 56          |
|       |           | X | 0,62                                    | 0,47  |             | 0,62                                   | 0,81  |             |
|       | CG (n=11) | — | 1,21                                    | 1,57  | 29,7        | 2,23                                   | 2,77  | 24,2        |
|       |           | X | 0,97                                    | 0,51  |             | 0,73                                   | 0,52  |             |
| girls | EG (n=9)  | — | 1,36                                    | 2,12  | 55          | 2,31                                   | 3,8*  | 64          |
|       |           | X | 0,61                                    | 0,47  |             | 0,44                                   | 0,43  |             |
|       | CG (n=11) | — | 1,26                                    | 1,65  | 30,9        | 2,29                                   | 2,77  | 28,8        |
|       |           | X | 0,41                                    | 0,49  |             | 0,56                                   | 0,45  |             |

Notes: \*— in  $p < 0,05$  the differences between the indicators are significant.

The same is observed in the indicators of short-term memory, where the increase in points in the EG was 56-64 %, and in CG - 24,2-28,8 % ( $p < 0,05$ ). Improvements in the mental and emotional state of children were observed after running games in the volume we proposed.

In Fig.4. results of perception of play activity of mentally retarded children of control and experimental groups in dynamics are presented.

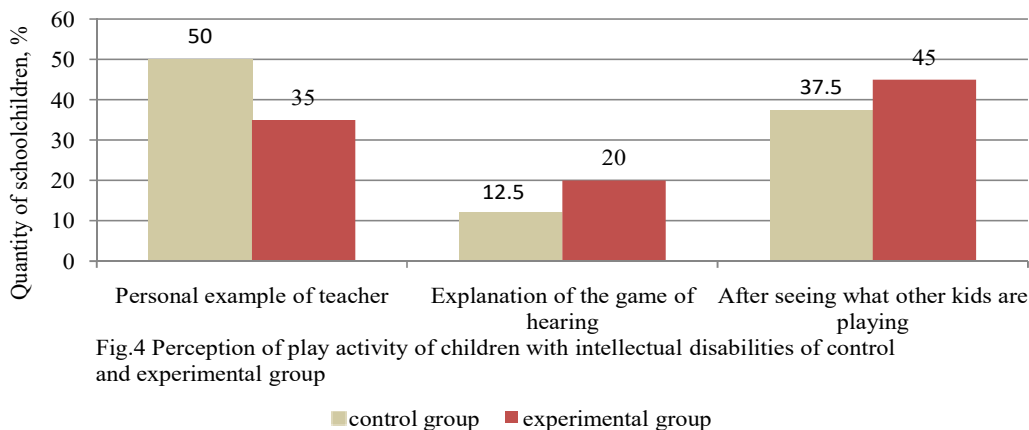


Fig.4 Perception of play activity of children with intellectual disabilities of control and experimental group

As a result of repeated running games of different orientation and intensity, in different conditions we conducted observations and concluded that in the experimental group children are best perceived play activity after watching the game, observing the course of its conduct (45 %) and the worst oral explanations (20 %),

because if the teacher says too much, children with intellectual disabilities are involved in the braking process. After personal participation in the game teacher educates children to play activities for 35 %.

In the control group, students are also more likely to perceive play activity through the personal example of a teacher (50 %). This is due to the fact that children with intellectual disabilities lack abstract and logical thinking, and prevail over concrete ones. After observing the course of the game, where their comrades are involved, the students of the control group perceive the game activity by 37.5 %. After oral explanations, the game material is perceived worst by the students of the control group - by 12.5 %, which is natural with such an abstract and logical perception, and it is necessary to pay attention to the teachers in the practical activity..

### **Discussion.**

Creating a healthy educational environment in educational institutions is the main prerequisite for increasing physical activity, preserving and enhancing health, improving the level of physical fitness of children with intellectual disabilities, which implies rational planning of the educational load on the child; the harmonious combination of her motor activity with mental activity; organizing a balanced diet and more (Dmitriev, 2002; Dubogai, 2005; Krutsevich, 2017).

In the works of Yudilevicha (1981) it is proved that the emotional-volitional sphere of students of this category is characterized by immaturity, inadequacy of emotions, instability of moods, low level of means of emotional expressiveness. But not every emotional strain causes harm to the health of the child: sometimes it creates the necessary psychological basis for creative activity, for overcoming difficulties and failures. Without knowledge of the mechanisms of formation of emotional sphere of mentally retarded children, without taking into account the specifics of emotional manifestations, it is impossible to properly and qualitatively build corrective work. Research by Sermeev (1990), Krutsevich (2017), Dubogai (2005), Shapkova (2009) has shown that the body of a child constantly requires motor activity.

Sermeev (1976), Mozgovoy et.al. (2006), Shapkova (2009), in their studies, point out that in a healthy child behavioral responses and emotional manifestations are regulated by intelligence, whereas children with mental retardation often act under the influence emotional impulses.

A number of authors, Marinicheva (1990), B.V. Sermeev (1976, 1990), pay great attention to the problems of integration and socialization of children with intellectual disabilities into the life of modern society through physical education and sports.

In works Mozgovyi (1996, 2006), Sermeeva (1990), Talitskaya (2007) observed that the gradual and availability of the material in class, a prerequisite for mastering of various motor skills, game operations, development of physical qualities and abilities correction of secondary deviations development, which, in the future, will make their life easier and will allow them to adapt in today's society.

Over the years, a number of scholars involved in the organization of physical education for children with intellectual disabilities have paid great attention to the impact of various types of physical activity on the physical and mental state of children with this nosology, Dmitriev (2002) noted the positive influence of rhythm, Kozlenko (1987) and Yurovsky (1985) recommend the use of elements of basketball and volleyball, Glazyrin (2006), Lerner (2013) offer active swimming lessons, which significantly increase the level of development of all motor qualities.

There are also technologies for conducting the most mobile games for children with intellectual disabilities. In their works, Lesko & Trash (2002, 2004) propose to carry out moving games according to the three most important and relevant criteria: the intensity, the development of physical qualities, the adequacy of a certain plot accessible for children to understand.

The author Snesar (2013) recommends pedagogical game training technology where different blocks of games and game exercises are designed and structured to address a wide range of wellness, educational, social challenges.

In our research it is noted that after the use of specially selected moving games, children had a cheerful mood, joy, pleasantness, peace, the number of dissatisfaction decreased.

As a result of diagnostics, psycho-emotional state of children with intellectual disabilities, we were able to trace the mood of all students in the team, to assess the psychological situation, to determine the general character of the emotional state of the whole group, and Lutoshkin (1988) also recommends, monitor the emotional state and mood of each pupil separately.

### **Conclusions.**

Mobilizing game, initially intended as a child's entertainment, allows unobtrusively solve a lot of corrective and developmental tasks, initiating the activity of the students themselves. Combining physical exercise, emotional component of mood and mental load in moving games, we bring children who are mentally retarded to living conditions, mastering elements of social skills and relationships, and contribute to improving the mood and development of the child as a whole. Knowledge by the teacher of the mood and emotional state of each student and the class as a whole allows you to identify and solve the tasks of each lesson in physical education more effectively.

Movement games can be used during developmental and physical training as an effective means of therapeutic influence in some mental disorders, as an effective non-medication. It has a positive effect on the physical and psychoemotional state of children with intellectual disabilities and can be applied in the process of adaptive physical education.

**Conflict of Interest.** The authors declare that there is no conflict of interest.

### References.

- Baikina, N. (2014). *Individual'nyye metodiki adaptivnoy fizicheskoy kul'tury detey s umstvennoy otstalost'yu s zaderzhkoy psikhicheskogo i rechevogo [Individual methods of adaptive physical culture of children with mental retardation with mental and speech delay]*. Zaporizhia: Zaporizhzhya National University [in Ukrainian].
- Dmitriev, A. (2002). *Fizicheskaya kul'tura v spetsial'nom obrazovanii [Physical Education in Special Education]*. Moscow: Academy [in Russian].
- Downs, S.J., Fairclough, S.J., Knowles, Z.R., & Boddy, L.M. (2016). Physical activity patterns in youth with intellectual disabilities. *Adapted Physical Activity Quarterly*, 33, 374–390. doi:10.1123/APAQ.2015-0053
- Dubogai, O. (2005). *Obucheniye v dvizhenii [Training in motion]*. Kiyev: School world [in Ukrainian].
- Fedoseeva, O. (2012). Osobennosti igrovoy deyatel'nosti detey s intellektual'noy nedostatochnost'yu [Features of the play activity of children with intellectual disabilities]. *Molodoy uchenyy – Young scientist*, 11, 489–491. [in Russian]
- Gayash, O. (2015). Spivpratsya fakhivtsiv u inklyuzyvnomu navchanni yak neobkhidna peredumova zabezpechennya korektsiynoyi spryamovanosti pedahohichnoyi roboty [Cooperation of specialists in inclusive education as a prerequisite for ensuring correctional orientation of pedagogical work]. *Aktual'ni problemy navchannya ta vykhovannya lyudey z osoblyvymy potrebamy – Actual problems of education and education of people with special needs*, 12(14), 99-102 [in Ukrainian].
- Glazyrin, I. (2006). *Plavaniye [Swimming]*. Kiev: Condor [in Russian].
- Hammeken, Peggy. (2000). *Inclusion: 450 Strategies for Success: A Practical Guide for All Educators Who Teach Students With Disabilities*. Paperback: Publisher: Corwin; Updated edition, 192 p.
- Imas, Ye., Dutchak, M., Trachuk, S. (2013). *Strategies and recommendations for a healthy lifestyle and physical activity: a collection of materials from the World Health Organization*. Kiev : Olympic literature [in Ukrainian].
- Kozlenko, N. (1985). *Fizicheskoye vospitaniye uchashchikhsya vspomogatel'noy shkoly [Physical education of secondary school students]*. Kiev: Soviet school [in Russian].
- Krutsevich, T. (2017). *Teoriya ta metodyka fizychnoho vyxovannya: pidruchnyk dlya studentiv vyshhyx navchalnyx zakladiv ta sportyvnyx vuziv: u 2 knyhas [Theory and methods of physical education: a textbook for students of physical education and sport universities: in 2 books]*. Kiev : Olympic literature [in Ukrainian].
- Kuznetsova, L. (2014). *Sovremennyye tekhnologii rehabilitatsii detey s otkloneniyami umstvennogo razvitiya [Modern technologies for the rehabilitation of children with mental developmental disabilities] International materials. scientific-practical conference*. Lipetsk, Russia. 49 - 51[in Russian].
- Lerner, V. (2013). Soderzhaniye zanyatiy plavaniyem s umstvenno otstalymi det'mi v ramkakh adaptivnoy dvigatel'noy reaktsii [Content of swimming lessons with mentally retarded children in the context of adaptive motor response]. *Vestnik Tambovskogo universiteta – Bulletin of the University of Tambov*, 178-184. [in Russian].
- Lesko, O. & Trash, V. (2004). *Rukhlyvi ihry dlya molodshykh shkolyariv iz zatrymkoyu psykhhichnoho rozvytku [Mobile games for younger students with mental retardation]*. Lviv [in Ukrainian].
- Lesko, O. (2002). Rukhlyvi ihry yak efektyvnyy zasib fizychnoyi korektsiyi shkolyariv iz zatrymkoyu psykhhichnoho rozvytku [Moving games as an effective means of physical correction for students with a mental retardation]. *Moloda sportyvna nauka Ukrayin – Young sports science of Ukraine Lviv*: LDIFK, Issue.6 [in Ukrainian].
- Lutoshkin, A. (1988). *Emotsional'nyye potentsialy kollektiva [Emotional potential of the team]*. Moscow: Pedagogy [in Russian].
- Marinicheva, G. (1990). *Nasledstvenno obuslovlennyye formy umstvennoy otstalosti u detey (kliniko-geneticheskiy aspekt) [Hereditary forms of mental retardation in children (clinical genetic aspect)]*: *Extended abstract of Doctor's thesis*. – Moscow [in Russian].
- Martin Kudláček, Natalia Morgulec-Adamowicz, Joeri Verellen. (2010). European Standards in Adapted Physical Activity. 108
- Mersiyanova G., Makarchuk N., Gladchenko I., Visotska A. Trikoz S., Blech G.et al. (2013). *Kontseptsiya doshkol'nogo vospitaniya dlya detey s umstvennoy otstalost'yu [The concept of preschool education for children with mental retardation]*. Kirovograd: ÍmekS-LTD [in Ukrainian].



- Moskalenko, N., Kovtun O., Alfiorov O., Kravchenko O., Maloivan Ya. (2014). *Zahal'ni osnovy adaptivnoho fizychnoho vykhovannya [General basics of adaptive physical education]*. Dnipropetrovsk: Innovation [in Ukrainian].
- Mozgovoy, V., Dmitriev, A., Samylichev, A. (1996). *Metodicheskiye rekomendatsii po organizatsii fizicheskogo vospitaniya vo vspomogatel'noy shkole [Guidelines for the organization of physical education in an auxiliary school]*. Moscow [in Russian].
- Mozgovoy, V., Yakovleva, I., Eremina, A. (2006). *Osnovy oligofrenopedagogiki [Basics of oligophrenopedagogy]*. Moscow: Academy [in Russian].
- Pelyh, E. (2011). Formirovaniye motivatsii k fizkul'turno-sportivnoy deyatel'nosti u shkol'nikov s narusheniyami intellekta na zanyatiyakh adaptivnym fizicheskoye vospitaniyem [Formation of motivation for physical education and sports activities among schoolchildren with intellectual disabilities in the classroom by adaptive physical education]: *Extended abstract of Doctor's thesis*. – St. Petersburg: Lesgaft University [in Russian].
- Rimmer, J. (2008). Promoting inclusive physical activity communities for people with disabilities. President's Council on Physical Fitness and Sports *Research Digest*, 9(2), 1–8.
- Sermeev, B. (1976). *Metodika vospitaniya dvigatel'nykh kachestv u anomal'nykh detey [Methods of raising motor skills in abnormal children]* Gorky [in Russian].
- Sermeev, B. (1990). Puti povysheniya effektivnosti fizicheskogo vospitaniya detey s otkloneniyami v razviti [Ways to improve the effectiveness of physical education of children with developmental disabilities]. *Defektologiya – Defectology*, 4, 24 [in Russian].
- Shapkova, L. (2009). *Chastnyye metody adaptivnoy fizicheskoye kul'tury [Private methods of adaptive physical culture]*. Moscow: Soviet Sport [in Russian].
- Snesar, N. (2013) Pedagogicheskaya tekhnologiya igrovogo treninga v fizicheskom vospitanii detey s legkoy stepen'yu umstvennoy otstalosti [Pedagogical technology of game training in the physical education of children with mild mental retardation]. *Fizicheskaya kul'tura i sport – Physical Culture and sport*, 1, 154–161. [in Russian].
- Syriopoulou-Delli, C.K., Cassimos, D.C., & Polychronopoulou, S.A. (2016). Collaboration between teachers and parents of children with ASD on issues of education. *Research in developmental disabilities*, 55, 330-345. doi: 10.1016/j.ridd.2016.04.011
- Talitskaya, O. (2007) Formirovaniye sportivnykh dvigatel'nykh navykov u tyazhelo umstvenno-otstalykh detey-invalidov na primere zanyatiy plavaniyem. [Formation of sports motor skills in severely mentally retarded disabled children using the example of swimming]. *Extended abstract of Doctor's thesis*. – Moscow [in Russian].
- Todd, T. & Reid, G. (2006). Increasing physical activity in individuals with autism. *Focus on Autism and Other Developmental Disabilities*, 21(3), 167–176. Retrieved from <http://foa.sagepub.com>
- Vaskov, Yu. & Pashkov I. (2006). Upravlinnya fizychnym vyxovannyam v zahalnoosvitniomu navchalnomu zakladi [Management of physical education in a general educational institution]. *Kharkiv: Torsing Plus* [in Ukrainian].
- Viskovatova, T. (2012). K probleme vzaimosvyazi negativnogo vliyaniya prirodnykh, antropogennykh faktorov i psikhicheskoy energii individa [To the problem of the relationship of the negative impact of natural, anthropogenic factors and mental energy of the individual] London, Great Britain, Makeevka, 24–27 [in Russian].
- Whitebread, D., Neale, D., Jensen, H., Liu, C., Solis, S.L., Hopkins, E., Hirsh-Pasek, K. Zosh, J. M. (2017). *The role of play in children's development: a review of the evidence (research summary)*. The LEGO Foundation, DK.
- World Health Organization (2015). The European Mental Health Action Plan 2013–2020. Available from: <https://apps.who.int/iris/bitstream/handle/10665/175672/WHO-Europe-Mental-Health-Acion-Plan-2013-2020.pdf?sequence=1&isAllowed=y>
- Yudilevich, Ya. (1981). Uchet individual'nykh osobennostey oligofrenov-imbetsilov v korrektsionno-vospitatel'noy rabote [Accounting for the individual characteristics of oligophrenic-imbeciles in correctional and educational work]. *Defektologiya – Defectology*, 3, 51–57 [in Russian].
- Yurovsky, S. (1985). Vospitatel'naya rabota s uchashchimisya vo vspomogatel'noy shkole v protsesse zanyatiy po fizicheskoy kul'ture [Educational work with students in the auxiliary school in the process of training in physical culture]. *Defektologiya – Defectology*, 1, 39–44 [in Russian].