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Contributions to the psychomotor development of preschool children, through specific kinetoprophylactic exercises
Contribuţii la dezvoltarea psihomotrică a preşcolarului, prin exerciţii specifice kinetoprofilaxiei

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Abstract

Background. The special importance of psychomotor education refers to the whole personality of the child, combining motor and mental elements that may cause the regulation of individual behaviour including participation in various processes of motion that will allow the development of a healthy adult quality of life. Using kinetoprophylaxis as a principal means in primary school insertion and prevention of possible problems that may occur brings additional support to the educational process.

Aims. The aim of the study was the enrichment of kinetic knowledge and kinetic components. In addition, the aim was to facilitate and ensure a favorable school insertion process by improving the psychomotor status of the child.

Methods. The study was conducted on a number of 50 children aged 5-6 years, belonging to Kindergarten "Casa cu Poveşti" Tîrgu Mureş, during October 2013-June 2014. The evaluation was carried out in two stages, an initial one and a final one, using the Portage Motor Scale. After the initial assessment, the subjects were divided into two groups, a control group consisting of 25 children and an experimental group of 25 children showing signs of disturbance and fragility in the psychomotor development process.

Results. The arithmetic mean obtained for the experimental group was 19.84 points on the initial testing and 23.96 points on the final testing, while that of the control group was 22.92 points on the initial testing and 24.44 points on the final testing. The experimental group achieved an improvement of 4.12 points compared to 1.52 points of the control group.

Conclusions. Our study shows that applying kinetoprophylactic activities improved the kinetic knowledge and components of the subjects and thus, their psychomotor status.

Key words: psychomotricity, kinetoprophylaxis, preschool children, education.

Rezumat

Premize. Importanţa deosebită a educaţiei psihomotrice vizează întreaga personalitate a copilului, îmbinând elementele motorii şi psihice ce pot determina reglarea comportamentului individual, incluzând participarea acestuia la diferitele procese de mişcare, care vor permite dezvoltarea calităţii vieţii sănătoase de adult. Aplicarea kinetoprofilaxiei ca mijloc principal în procesul de inserţie şcolară şi prevenţie a posibilelor dificultăţi ce pot să apară aduce un sprijin suplimentar în procesul instructiv-educativ.

Obiective. Obiectivul central al studiului a fost îmbogăţirea bagajului kinetic şi a componentelor kinetice. De asemenea, s-a urmărit facilitarea şi asigurarea procesului de inserţie şcolară favorabilă, prin îmbunătăţirea stării psihomotrice a copilului.

Metode. Studiul a fost realizat pe un număr de 50 copii cu vârstele între 5-6 ani, din Grădiniţa cu Program Prelungit "Casa cu Poveşti" din Tîrgu Mureş, pe perioada octombrie 2013-iunie2014. Evaluarea s-a realizat în două etape, una iniţială şi una finală cu Scala Portage Motor. După evaluarea iniţială, beneficiarii studiului au fost structuraţi în două grupe, un grup control format din 25 de copii şi un grup experiment format din 25 de copii care au prezentat unele semne de perturbări, fragilităţi în procesul de dezvoltare psihomotrică.

Rezultate. Media aritmetică obţinută la testarea iniţială de grupul experiment a fost de 19,84 puncte, iar la testarea finală a fost de 23,96 puncte, iar la grupul control a fost de 22,92 puncte la testarea iniţială, iar la testarea finală a fost de 24,44 puncte. Grupul experiment a obţinut o îmbunătăţire cu 4,12 puncte, faţă de 1,52 puncte a grupului control.

Concluzii. Studiul nostru dovedeşte că prin aplicarea activităţilor kinetoprofilactice s-a îmbunătăţit bagajul şi componentele kinetice ale subiecţilor şi, implicit, starea psihomotrică.

Cuvinte cheie: psihomotricitate, kinetoprofilaxie, preşcolar, educaţie.

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Introduction

The quick and profound transformation of contemporary civilization has brought to the foreground the production of symbolic goods. This transformation is over-mechanized by cybernation and automation, having a social and cultural impact: the transformation of health and education into new industries (Ortan, 2009).

The period we live in is one that brings multiple and rapid changes requiring continuous adaptation since childhood (Vernon, 2004). The growth and psychomotor development of children require special attention to prevent possible anomalies in the education of the new generation. The motor and mental development of the child must begin at birth by influencing the stimuli provided by the family (Albu et al., 2008).

According to Epuran, a human motor activity (2005) "is a body movement that is goal oriented, driven and supported by reasons; some movements and actions are subsumed to the ideal of human self-achievement".

Psychomotor education involves both the child's personality and mental and motor elements. They determine the adjustment of individual behavior including its participation in various motion processes that will enable the development of a healthy adult quality of life (Neagu, 2010). Psychomotricity is considered a very complex act that merges motor skills and mental skills in performing an action. The purpose of motricity extends from obvious motor activities to intellectual and sensory processes (Popovici & Matei, 2005). The specialists approach growth and physical, motor and mental development in all their complexity because all these processes can occur simultaneously (Albu et al., 2008).

The concept of personalized education nowadays is increasingly implemented in public opinion (Muskovits, 2011).

The evolution of psychomotricity is divided into three stages represented by innovation, integration and balance. The period of innovation is the stage in which the preschool child tests his abilities; thus, he accidentally discovers his hand due to an unexpected movement. Later, he tries to repeat the movement to achieve the same effect. The period of integration is characterized by more precise movements due to a better adaptation of nerve control. The preschool child manages to integrate data and express them through a well adapted psychomotor activity. The period of balance is characterized by rest periods alternating with progress periods. The development of the preschool child is a continuous process of transformation and adaptation (Albu & Albu, 1999).

In order to obtain psychomotor development, the following should be taken into account within the implemented programs:

- Motor development that favors motor control, the improvement of motion planes and the acquisition of gross motor skills.
- Personality development to optimize self-confidence, stimulation of communication and self-esteem (Predut-Barbu, 2012).

Human medicine divided into many branches: pediatrics, obstetrics and gynecology, neonatology, etc. aims to re-establish the disturbed equilibrium, which leads to other branches such as kinesiology, aimed at the prevention, education and rehabilitation of the threatened or disturbed balance by the application of movement (Pásztái, 2004).

Sbenghe (2008) says that "in order to accurately define kinesiology, we should say that it is the science of the motion of living organisms and structures which participate in these movements."

Kinetoprophylaxis is part of medical kinesiology; through specific means and methods, it contributes to the maintenance and improvement of the harmonious physical and mental development of the preschool child. Kinetoprophylactic activity through a holistic approach contributes to the progression of the preschool child towards a higher school stage.

The child's growth and development is carefully monitored based on certain principles formulated in this direction, and one of them is that this is a complex process dependent on a harmonious combination of physical, mental, social and emotional development (Cucerea & Simon, 2009).

To strengthen physical and nutrition health that children need, we use what should be the most solid instrument, the link between mental and motor development (de Onis et al., 2006). Motion games help to eliminate mental tensions (Merei & Binet, 2006). These motion games are applied by specialists in psycho-pedagogy, psychology and movement sciences.

Preschool and primary school children are in a continuous search for interaction, which they increasingly want (Hetherington et al., 2006).

Another motion proposal consists of rolling performed by children, which stimulates physical and mental development, because these movements improve their ability to concentrate (Blythe, 2006).

Psychomotricity as a science deals with the study of motor functions integrated and coordinated by mental functions (Albu et al., 2006). A direction of application of psychomotricity includes psychomotor education, psychomotor rehabilitation and psychomotor therapy (Neagu, 2012).

Hypothesis

The implementation of kinetoprophylactic exercises and the applied motion games will improve the psychomotor development of the target group.

Material and methods

We mention that, in agreement with the Declaration of Helsinki, the Amsterdam Protocol and the Directive 86/609/EEC, all study procedures were approved by an ethics commission within the School Centre for Inclusive Education No.2, Tîrgu Mureş, Romania concerning investigation on human subjects, and that we have obtained the written consent of the subjects and of their parents.

Research protocol

a) *Period and place of the research*

The study was carried out at the All-Day Kindergarten "House of Stories" in Tirgu Mures in the period October 2013 - June 2014.

b) *Subjects and groups*

The study subjects were 50 preschool children aged between 5-6 years.

To clearly evidence psychomotor development, an evaluation test, Portage Motor Scale, was applied (Table I).

c) *Tests applied*

Table I
Portage Motor Scale

No.	Items
1.	Balanced walk on a beam: forward, back, lateral.
2.	Hopping.
3.	Swinging, initiating and maintaining the movement.
4.	Loosening the fingers and touching each one with the big toe.
5.	Copying small letters.
6.	Climbing the wooden stairs or the steps of a slide with the length of 3 m
7.	Hammering a nail.
8.	Dribbling the ball with direction.
9.	Coloring 95% inside the contour.
10.	Cutting pictures from magazines, not exceeding 0.5 cm from the outline.
11.	Using the pencil sharpener.
12.	Copying difficult drawings.
13.	Cutting simple shapes from paper.
14.	Folding a square of paper diagonally 2 times in imitation.
15.	Catching a soft ball or a bag of sand with one hand.
16.	Jumping rope alone.
17.	Hitting the ball with a paddle or a stick.
18.	Picking an object while running.
19.	Skating forward about 3 m.
20.	Riding a bicycle.
21.	Sleighing.
22.	Walking or playing in a pool with water not higher than the waist.
23.	Driving a toy vehicle (truck) by pushing it with one foot.
24.	Jumping and spinning on one foot.
25.	Writing one's own name in block letters on a lined sheet.
26.	Jumping from a 30 cm height and landing on feet.
27.	Standing on one leg without support, eyes closed, for 10 seconds.
28.	Hanging from a horizontal bar, supporting one's own weight on arms for 10 seconds.

(Gherguț, 2011)

Portage Motor Scale Score: 1 - achieved; 0.5 - partially achieved; 0 - not achieved.

Quantified key interpretation: - Weak: 0-14 points; - Medium: 15 -19 points; - Advanced: 20 to 28 points.

The subjects were assessed in two stages: initial (I) and final (F).

After the results of the initial evaluation, the study subjects were divided into two groups, a control group (C) consisting of 25 subjects and an experimental group (E) consisting of 25 subjects that showed some signs of disturbance, fragility in psychomotor development.

Group E, in addition to the preschool program, benefited from kinetoprophylactic activities. The activities were divided into five modules, one module/week with a set of various exercises. Kinetoprophylactic activities were carried out in the morning and lasted for 20-30 minutes.

a) *Presentation of the kinetoprophylactic program*

The entire prophylactic program was focused on the acquisition of correct skills, through the stimulation of motor activity and self-image development.

The program was divided into 5 modules, one module/ week. The exercises were diversified and were implemented according to the physical and mental condition of subjects and their preferences. Specific exercises were conducted in the first part of the day and lasted for 10-30 minutes.

b) *Examples of exercises used to develop fine motor skills*

These exercises are particularly important in the formation of fine finger and hand movements. All this leads to a better handling of writing tools, to the avoidance of fatigue and the easy writing on the sheet of paper. The obtained effect is an increase in speed and the adoption of "silent" writing. All exercises should be conducted rhythmically, to develop flowing speech and writing-reading skills.

The exercises for the development of finger and hand muscles were: gripping and grasping the ball, finger tracing of precise contours in a box with sand, positioning the body parallel to the floor and supporting on hands and toes for executing pushups.

The exercises for the development of the small finger and hand muscles were: alternative and rhythmic opening and closing of the fingers; alternative and rhythmic spreading of the fingers and bringing them together; tracing letters in the air with the finger; cutting and coloring letters; rhythmic squeezing of a dynamometer or a rubber ball; writing graphemes using the contour pattern. During the remaining time, children were trained in pair or collective games.

c) *Examples of exercises for the development of the body scheme*

By the prevention and elimination of orientation disorders, the following can be avoided: reversing letters and graphemes; difficulties in connecting graphemes in writing and letters in reading; reading and writing in the mirror. For this, exercises leading to awareness of left-right, top-bottom relationships and for the correction of visual space agnosia are recommended. Exercises for the reinforcement of the body scheme can also be used:

- Exercises for the identification of different parts of the body;
- Exercises for recognizing one's own body segments in the mirror;
- Imitating the movements of different parts of the body;
- Knowledge of a doll body;
- Drawing the human body;
- Finalizing an incomplete drawing;
- Exercises of self-relating to objects in the environment and recognizing right and left segments;
- Building walking orientation skills in compliance with verbal commands;
- Exercises for the correct perception of the position of objects in space by reference;
- Spatial-temporal locations: time of the day, days of the week, etc.

d) *Examples of motion games for the development of the self-image*

Because of physical and mental fatigue, an emotional hypersensitivity and repulsion towards the educational process may develop in preschool children over time.

To overcome these behaviors, the best method is psychotherapy. This is used to eliminate conflicting and frustrating mental states.

The motion activities were carried out with the active participation of classroom teachers.

Examples of motion games:

- Children are seated on the floor in a circle, and they give the ball to each other; the game may be complicated by throwing the ball diagonally.
- Children are standing facing the mirror, with body cream in their palms; they are encouraged to spread the

cream on the mirror with circular movements in the form of waves, from right to left and vice versa.

- Children are seated in a circle and are asked to pass a colorful scarf from one to the other, at a slow rhythm, which is increased after 30 seconds.
- Individual work: preschoolers are taught to juggle a plastic bowling pin, then two pins.
- One-to-one work: throwing (passing) a cushion from one to the other, while counting, starting at a slower rate, increasing the rhythm after 15 seconds.
- Back-to-back, one-to-one work: throwing (passing) a cushion from one to the other, while counting, starting at a slower rate, increasing the rhythm after 15 seconds.
- Children standing in the kindergarten room, pieces of paper are thrown on the floor. Children gather the pieces one by one, first with the left hand, then the game is repeated with the right hand.
- Children in an Indian file, 2 m away from a mini basketball hoop placed at a height of 120 cm, throw the ball into the basket, first with both hands, then with the left hand, and finally, with the right hand.
- Children in an Indian file perform rhythmic walking exercises, on a predetermined distance; at the beginning they are allowed to set their own pace, then the therapist sets the pace.
- Children are positioned on one side of the kindergarten room. On the signal given by the therapist, they will run across the room.

e) *Examples of exercises to strengthen motor control*

- Exercises of spontaneous individual handling of several objects and toys (balls, cubes, dolls);
- Exercises of motor imitation: head movements (bending, rotation); trunk movements (leaning forward, bending, twisting); limb movements (rotation, bending);
- Practicing breathing through the game;
- Exercises to educate the relaxation and inhibition capacity;
- Exercises for strengthening and practicing actual laterality: hand, eye, foot;
- Exercises for practicing psychomotricity and developing the sense of rhythm: walking, running, jumping, rolling.

d) *Statistical processing*

For the statistical analysis of data, we used the SPSS 16.0 statistical calculation program.

Results

The arithmetic mean obtained at the initial testing was 19.84 points for group E and 22.92 for group C.

At the final testing, an arithmetic mean of 23.96 points in group E and 24.44 points in group C was obtained.

Between the I and F testing, there was an improvement of 4.12 points in group E and 1.52 points in group C.

After the initial testing and the assignment of subjects to group E and group C, an average of 19.84 in the experimental group and 22.92 in the control group was obtained. $p=0.001$ so, $p<0.05$, which means that the difference between the two groups was statistically significant.

After the final testing, the experimental group had an average of 23.96 and the control group had an average of 24.44. $p=0.224$ so, $p>0.05$, which means that the difference between the two groups was statistically insignificant.

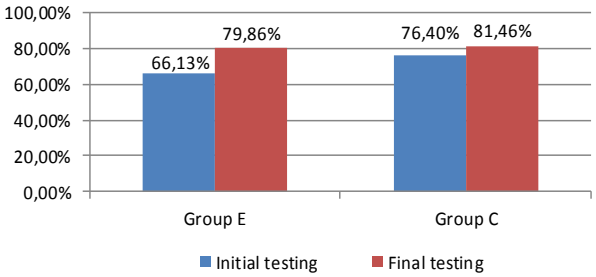

Fig. 1 – Results obtained by the subjects at the initial and final testing.

Discussions

The kinetoprophylactic exercises and motion games implemented in the experimental group were dosed in accordance with the requirements and planning of preschool teaching projects.

The time allocated to the implementation of the kinetoprophylactic program in the experimental group ranged between 20 and 30 minutes, depending on the complexity of work and the stressing level of exercise capacity.

In implementing the kinetoprophylactic program, the level of interest in certain motion games of the experimental group members was taken into account. Throughout the kinetoprophylactic activities, a permanent collaboration with the teachers at the institution where the study was carried out was maintained.

The results obtained following the initial and final evaluations, as well as the kinetoprophylactic program were presented to the parents of the experimental group and control group members by teachers, while complying with confidentiality, which means that the information was transmitted individually.

Following the application of the kinetoprophylactic program, the difference found between the experimental group and the control group at the initial testing was reduced, which was statistically confirmed. The psychomotor development of the experimental group was equal to that of the control group.

Conclusions

1. The implementation of kinetoprophylactic exercises and motion games improved the psychomotor development of the experimental group, which proves that the hypothesis was confirmed.
2. Following the application of the final test to the group of subjects, there was a considerable improvement in the psychomotor development of the experimental group, which demonstrates that our program had the desired effect.
3. We consider the study and monitoring of motor development as necessary, in order to have a healthier generation with a multidimensional valence to ensure the quality of life.

Conflicts of interests

There are no conflicts of interest.

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