

PROPHYLACTIC PHYSIOTHERAPY USED TO IMPROVE THE COORDINATION IN PRIMARY SCHOOL CHILDREN

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Abstract*

Objective. The objective of this research was to spot the coordination disorders in primary school children and to correct them through physical therapy means.

Methods. The research methods were established according to the objectives of the research, as follows: the study of the professional literature method, the testing method, the statistical-mathematical method and the graphical representation method.

Results. After the analysis of the results, it is obvious the dynamic games play a positive role in the development of the motor skills in children between 7 and 10 years of age. Movement games have a much more impactful effect on children during their physical and mental development period, thus besides the satisfaction and pleasure, the dynamic games have an effect on the psychomotor skills and character traits, constituting an important link in the chain of actions influencing the motor development, combining harmoniously the instructive and educational element with the fun element.

Conclusions. At the end of the research, it can be concluded that by selecting and implementing age-specific games, one can educate and improve the psychomotor skills.

Keywords: intervention, coordination, children, school.

Introduction

The coordination education process is a complex one that needs a longer period of time. The coordination is educated in parallel with the development of the muscular system and the brain. During the growth and development process, the nervous system is developing especially at the brain level, because of a large number of motor skills and habits that were learned in an organized and directed manner. In order for the movement to be performed under good conditions and to be useful, it must be coordinated. This study uses the following definition of coordination: "the combination of a number of muscles in a continuous, smooth motion scheme, performed under normal conditions." Movement coordination is realized through a harmonious collaboration between multiple muscle groups that take part to the performance of the motion. A coordinated movement presupposes control and balance. A coordinated activity is automated, not perceived consciously, even though it can be performed consciously.

In the professional literature, the term coordination is synonymous to ability, skill, precision, accuracy, finesse, grace, balance, stability, mastery, all of these representing an individual's ability to learn and quickly combine new movements, to perform harmonious and effective motions within a given time with a low

energy consumption (Rață, G. & Rață, B.C., 2006:243).

In the opinion of Albu, C. (2004:30), coordination highlights one's ability to organize and regulate the movement, emphasized by the economy of gestures, which favors the precision and safety of the motor act performance.

According to Rață G. (1999), motor coordination, as dexterity, is considered to be a very complex psychomotor skill supported by the other psychomotor skills, and interrelated to the motor skills.

There are several aspects that limit the education of coordination, among which: the motor experience, the development level of the other skills, the finesse and precision of the other senses, and the motor intelligence.

The perturbation of the coordination function in the voluntary movements is caused by central nervous system lesions, leading to apraxia (difficulty in performing habitual movements), ataxia (non-paralytic motor disorder characterized by a defective coordination of voluntary movements, with also balance delays), as well as to discoordination (Radu, I.D., Ulici, Gh., 2003: 56).

The school period represents a stage that children go through to reach more advanced stages of life (adolescence, youth, adulthood, and regression). Like any other stage of life, the school period adapts the children both physically and mentally to the new social demands (Golu, P., Verza, E., Zlate, M., 1998:105). Being a

transition period, one can say that the small school children go through a development crisis, because over the course of it they undergo a series of personality changes that also generate educational problems.

According to age, physical exercise ensures a harmonious and complete functioning of the systems, tissues and cells. The promotion of exercise among children is important, as well as educating and convincing the parents that exercise contributes in a determining way to maintaining and strengthening the children's health, favoring the growth processes, improving their physical development, promoting the educational values, establishing civilized associative relationships and socialization.

This paper aims to emphasize the beneficial role of physical therapy in correcting the coordination disorders in primary school children, if a good collaboration with the subjects is ensured. There are no complete physical therapy studies in regards to the application of movement games to correct coordination disorders in apparently healthy children.

Starting from these aspects, the authors of this paper presumed that by conducting a specific evaluation, one can spot coordination disorders in primary school children, and that through specific intervention measures, one can correct and improve their general dynamic coordination.

Methods

The research was conducted between March 2, 2017 and July 30, 2017 in the gymnasium and outdoor soccer court of School 10 of Bacau, where the tests and programs were applied.

The specific intervention sessions had a duration of 50 minutes, being conducted 1-2 times a week. The drills were performed slowly, at the subjects' own pace, with short breaks of 10-15 seconds.

The prophylactic physiotherapy programs were presented as games, with instructive-educational possibilities for the psychomotor skills - the development of throwing and catching, the education of the coordination in the upper limbs, the education of balance, the development of muscle strength in the lower limbs, the education of general coordination, the training of crawling, the development of segmental coordination; for the cognition - the education of proprioception, the development of attention; for the affection and social skills - the education of perseverance and courage, the education of collaboration skills, the development of team work skills, of the ability to respect the rules and discipline, comprising also aspects of joy, novelty and spontaneity, without ignoring the need for a correct performance in

order to favor the learning of motor skills. The drills had an analytical to global character, without overworking the children's bodies, the effort being carefully and gradually dosed, the rhythm and the number of repetitions being performed according to the set objectives. The breaks between drills ensured the recovery of the major functions, comprising breathing and relaxation exercises while walking.

Also, an emphasis was put on training the correct posture habits and learning utilitarian-applicative skills.

The research was conducted on a group of 25 subjects, aged between 7-10, who were initially assessed, the actual research subjects being represented by 10 children on whom the intervention programs were applied.

Over the course of the research, a series of tests were performed in order to gather relevant data regarding the development level of the children's motor skills, such as the "**Touch the boards (Eurofit) Test**" - used to assess the performance speed and the coordination in the upper limbs, it is a test based on the alternate touch of two marked areas of a board with the dominant hand (<http://fsmss.ub.ro/images/stories/brosura.pdf>).

Testing the static balance (fig. 1), using a metal stand of 50 cm in length, 4 cm in height and 3 cm. in width, the subject (barefooted) put one foot at his choice on the stand, then by flexing his other calf, he grabs with his hand the leg on the same side. The other arm is stretched and obliquely orientated upwards (see figure 1). The examiner helps fix this position, after which the subject is free to perform and the timer starts. When the ground is touched by any part of the body, the timer is stopped. The time recorded by the subject is transformed in a grade according to the rules.

Testing the hand-eye coordination

The "Points" Test, designed by psychologists Binet and Vaschide, uses an A4 sheet of paper that has two squares of 10 cm. each, both divided into 100 smaller squares of 1 cm. The subject makes a dot with a writing instrument in each small square, first with the dominant hand, in the big square in the left of the sheet, then with the other hand in the other square. At the end, the time from one hand and from the other are added, the sum representing the subject's total time, which then will be transformed in a grade according to the rules.

Complex coordination — "Fan" test - throwing six balls toward a horizontal target, the subject must move fast in six different successive directions, at the end of which there is a ball of different size and weight. The subject then comes back to the starting point with the ball found

at the end of the direction, and throws it in a circle opposite to the landmark, to a distance of 6 m relative to the starting point (fig. 3). The time for this drill is 30 sec. for boys and 40 sec. for girls, each second over this time being penalized by one point.

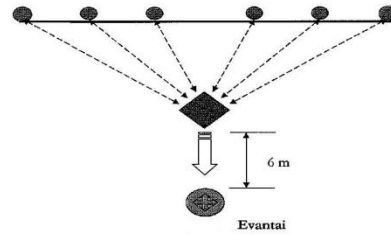


Figure 2. The "Fan" Test

(<http://fsmss.ub.ro/images/stories/brosura.pdf>)

"Small marathon" leg coordination test The subject runs and changes direction between six parallel lines traced at a distance of 3 m apart, as seen in figure 3. At each direction change the subject must overturn the poles with his hand. Each pole that is not down is penalized by two points. The subject starts at the examiner's signal, and the timer stops when the subject's chest goes over the finish line traced on the ground (<http://fsmss.ub.ro/images/stories/brosura.pdf>).

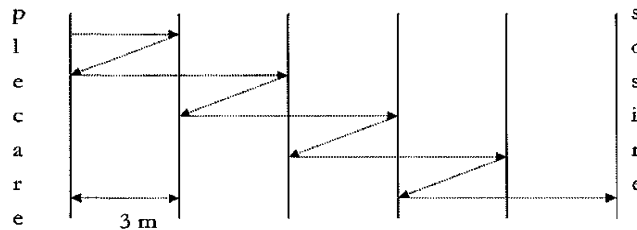


Figure 3. "Small marathon" test (<http://fsmss.ub.ro/images/stories/brosura.pdf>)

The research methods were established according to the objectives of the research, as follows: the study of the professional literature method, the testing method, the statistical-mathematical method and the graphical representation method (Ababei, 2006).

Results

After analyzing the initial and final assessments, we could see that this methodology lead to an improvement of coordination in children.

The "Touch the boards (Eurofit)" Test, being based more on performance speed and coordination, shows us that the girls are much faster in their performance, and have better coordination than the boys, in the initial testing, and after applying our exercise programs and dynamic games, we observed an improvement of this motor skill, as it can be seen in Figure 4.

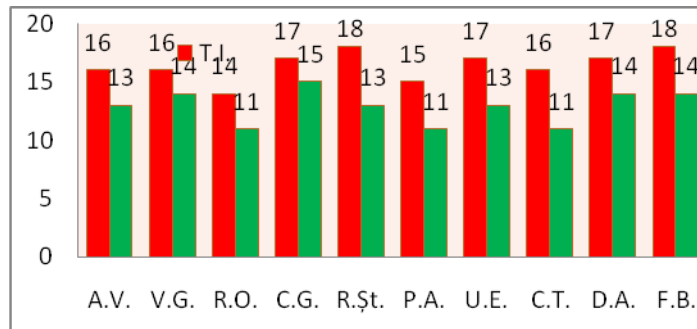


Figure 4. Touch the boards (Eurofit) Test

As one can see in Figure 5, in the **Flamingo test**, the boys have recorded lower values than the girls, during the initial tests, while after applying

our games and exercises, positive values were recorded regarding the static balance.

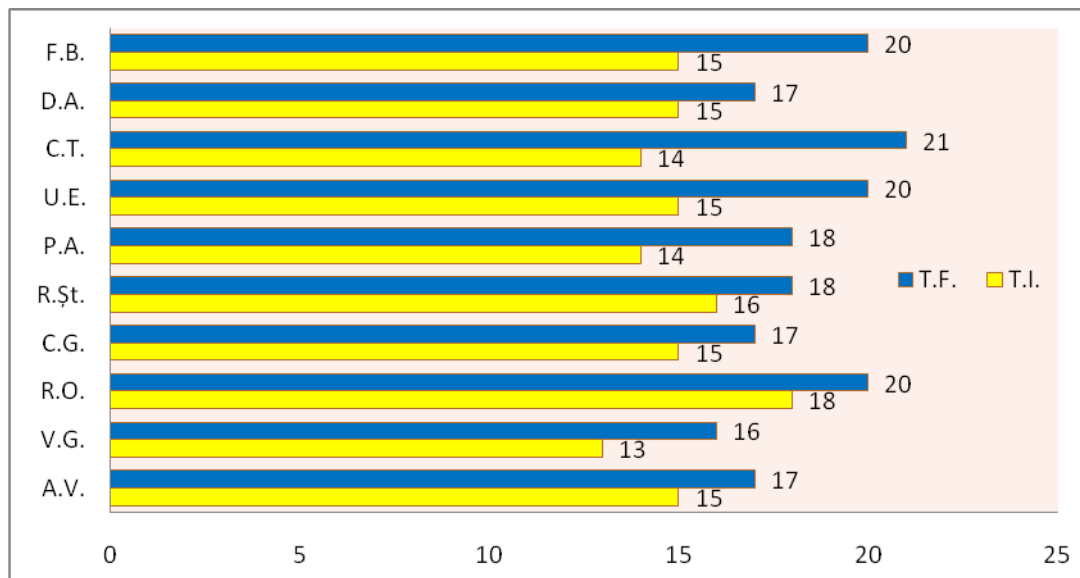


Figure 5. Testing the static balance (Flamingo Test)

In the **"Fan" test**, characterized by performance speed, precision, coordination, skill, etc., during the initial tests, the subjects encountered some small difficulties in performing it (the weight of the ball, the precision of placing

the ball inside the circle, the returns during the movement), so the results present higher values after applying our exercises and games, both in girls, and in boys, as it can be seen in Figure 6.

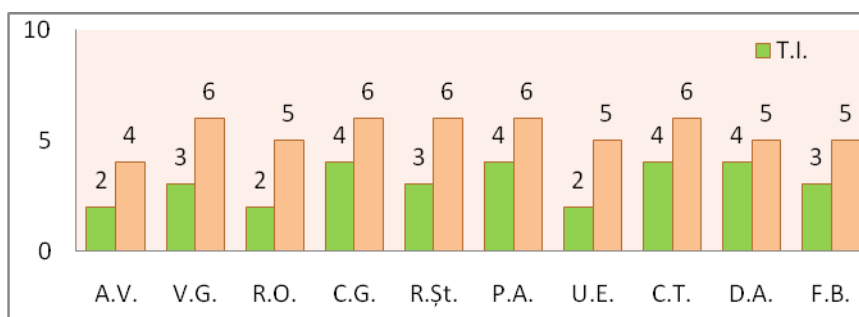


Figure 6. Complex coordination

"Fan" test - throwing six balls toward a horizontal target

In the "Small marathon" leg coordination test, represented in Figure 7, the subjects confronted with small problems regarding the backwards movement during the test; the girls

recorded better results than the boys in the initial test, and after the final assessment, the results were remarkable for both genders.

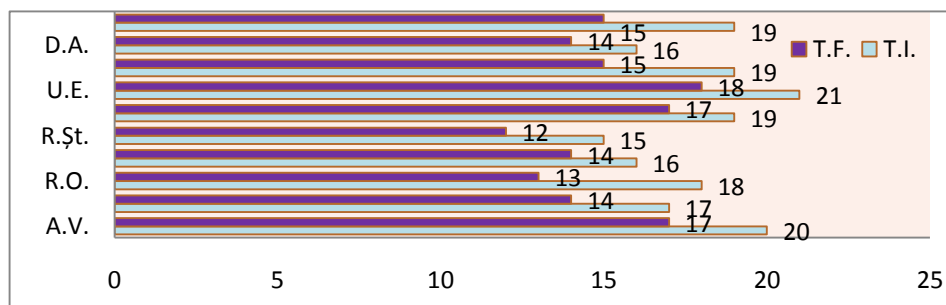


Figure 7. "Small marathon" leg coordination test

During the initial testing for the "Points" hand-eye coordination test, the subjects had difficulties regarding the coordination the performance speed, the skill. It was also observed that the subjects who had very good upper limbs have a very good

coordination and speed, and the girls were better prepared than the boys. During the final testing, it was observed an increase and an improvement of the initial values, as it can be seen in Figure 8.

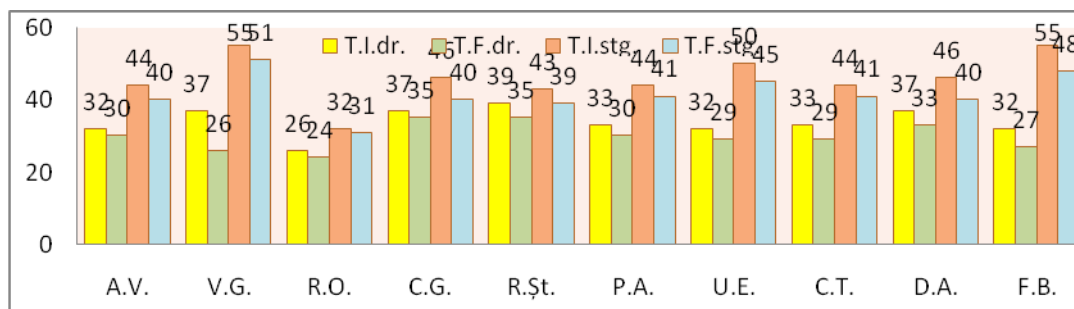


Figure 8. "Points" Test

After the analysis of the results, it is obvious the dynamic games play a positive role in the development of the motor skills in children between 7 and 10 years of age.

Discussion

Moțet (2001) thinks that the development process is realized through exercise, which is permanently enriched, tying the biological element to the psychological one and to experience. Gradually, the motor behavior of the children becomes habitual and is a part of the whole psychomotor skills, mobilizing the children's entire personality.

Exercise is an important link in the chain of actions specific to children that can influence the improvement of coordination of inter-segmental movements, combining the instructive and educational elements with the fun and good time

elements. The movement games are used at school age as a means of general physical development. They offer favorable conditions for the complex development of the motor skills and of the physical qualities that are necessary in life. The practice of the movement games contributes to the formation of coordinated movements, of the ability to quickly engage, to the skillful solving of various motor tasks.

Conclusions

At the end of the research, it can be said that the initial hypotheses were confirmed and based on the results, the following conclusions can be drawn:

- physical activity in general results in an increase in joint mobility, a formation of the correct body posture reflex, muscle development, a harmonious development of the body, an

adaptation of the body to effort, the formation and development of motor skills;

- the dynamic games have a more profound effect on the children who are in a period of mental and physical development. The dynamic games give a sense of satisfaction and pleasure, and they have a considerable effect on the psycho-motor skills, and on the personality traits;

- exercise is an important link in the chain of actions specific to children that can influence the improvement of coordination of inter-segmental movements, combining the instructive and educational elements with the fun and good time elements.

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References

- Ababei R., 2006, Metodologia cercetării activităților corporale, Editura Casei Corpului Didactic, Bacău
- Albu C., Albu M., Gherguț A., 2007, Dicționar de kinetoterapie, Editura Polirom, Iași
- Ciolcă E., 2005, Jocul de mișcare în kinetoterapie, Editura Carta Universitară, București
- Golu P., Verza E., Zlate, M., 1998, Psihologia copilului, Editura Didactică și Pedagogică, București
- Moțet D., 2001, Psihopedagogia recuperării handicapurilor neuromotorii, Editura Fundației Humanitas, București
- Radu I.D., Ulici Gh., 2003, Evaluarea și educarea psihomotricității, Editura Fundației Humanitas, București
- Rață G., 1999, Aptitudini motrice de bază, Editura Plumb, Bacău
- Rață G. & Rață B.C., 2006, Aptitudinile în activitatea motrică, Editura Edusoft, Bacău
- Stănescu M. & Ciolcă C. & Urzeală C., 2005, Jocul de mișcare, Metodă și mijloace de instruire în educație fizică și sport, Editura Cartea Universitară, București
- Urzeală C., 2005, Jocul de mișcare, Metodă și mijloc de formare a deprinderilor motrice fundamentale, Editura Carta Universitară, București
- http://fsmss.ub.ro/images/stories/admitere/ghid_cad_idati_admitere_fsmss_-_2011.pdf