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**ABSTRACT**

**DOCTORAL THESIS**

**MOTOR AND PSYCHOMOTOR EDUCATION BASED  
ON KINETIC STIMULATION PROGRAMS FOR  
CHILDREN WITH INTELLECTUAL DISABILITIES**

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**BUCHAREST  
2014**

*Keywords: motor and psychomotor education, intellectual disability, Down syndrome.*

The doctoral thesis titled “**MOTOR AND PSYCHOMOTOR EDUCATION BASED ON KINETIC STIMULATION PROGRAMS FOR CHILDREN WITH INTELLECTUAL DISABILITIES**” is structured on three parts, comprising 14 chapters, 55 subchapters, tables and graphs.

**Part I**, called “*Theoretical and conceptual basis of the research*”, represents the theoretical substantiation of the doctoral thesis, where we aimed to highlight the way of integrating the formative process addressed to children with intellectual disabilities into the motor and psychomotor education field, by putting an emphasis on the importance of understanding the evolution, the motor and cognitive functioning of children who are in full development and have distinct psychological and functional characteristics.

If during the first years of life most of the motor behaviours are accumulated naturally, the activities performed through psychomotor education or physical education will refine the quality of motor control and will improve the motor performance of intellectually disabled children, under the conditions in which:

- **motricity** includes a multitude of movements, starting with the simplest reflex reactions to the complex forms of corporal expression resulted from the action of different stimuli, with the aim of adapting oneself to the surrounding environment;

- **psychomotricity** represents a basic complex function, which incorporates and combines the psychic phenomena with the motor ones, determining the behaviour regulation in each individual;

- **motor education** forms the aptitude of self-regulation of the motor behaviour; it creates one’s own motor experiences in different situations the child might be confronted with; it ensures the best possible development of children’s motor coordination or the accumulation of fundamental processes in the motor field; it develops globally the motor abilities related to posture, locomotion or object handling;

- **psychomotor education** facilitates the passage from concrete to abstract, being a form of “education through movement”, whose efficiency is revealed under the conditions in which the child has the awareness of his/her own body, knows its laterality, can situate himself/herself in space, masters the time, has stability and presents a coordination of his/her gestures and movements.

**Part II**, named “Preliminary research regarding the motor and psychomotor development of the child with intellectual disabilities”, started from the premise that each child has an own rhythm of evolution and a unique pattern of growth and development, the formation of new movement skills being

efficient under the conditions in which the child knows the parts of his/her body, has stability skills and can coordinate his/her motor gestures.

In this context, we aimed to investigate the body schema, balance and the general, segmental and intersegmental coordination, followed by the design and implementation of stimulation programs, in order to educate them using multisensory learning.

**Part III**, called “Contributions to the elaboration and application of kinetic stimulation programs for the psychomotor development of children with intellectual disabilities”, starts from the following premises:

- kinetic stimulation programs must be applied in the critical, sensible periods, during which some abilities are learned with a maximum easiness and effectiveness;

- each child has a potential whose development and valorisation depend on the way in which the family that supports him/her gets involved in this extremely complex process.

In order to emphasize the assertions mentioned above, we undertook a study that aimed at two directions of research, namely: application of kinetic stimulation programs to children with intellectual disabilities (6 to 15 years old), pupils of a special school, whose activity was carried out in an individualized manner, within the limits of the school syllabus and timetable, and a group of children with Down syndrome, aged between 4 and 8 years, who benefited, besides the family’s support and involvement, by an intensive program of individualized motor activities, based on the relationship between the child and a Special Olympics volunteer and/or the parent.

### **Hypothesis of the research for STUDY NO. 1**

*The education of psychomotor components, through their introduction into the kinetherapeutic treatment, will amplify the functional and motor recovery effects specific to the intellectually disabled child.*

### **Objective of the research**

To improve the motor and psychomotor capacity of children with intellectual disabilities, by using complex intervention programs adapted to each subject’s particularities.

### **Sample investigated**

The research was conducted on a sample made up of 27 pupils with intellectual disabilities and associated disorders. The groups were established depending on the kinetic diagnosis, the motor and psychomotor disorders of each child. Children submitted to experiment performed the psychomotor therapeutic program during kinetherapy lessons, the psychomotor therapy being associated to the kinetic one. We mention that the children with severe intellectual disabilities benefit weekly by 1-2 hours of psychomotor therapy within the specific therapies, but this therapy is achieved frontally. The therapeutic group includes 1 child or at most 2 children, due to the diversity of

their diagnoses or to their specific characteristics: deficient posture, low capacity of neuromuscular control, disorders of static and dynamic balance, inefficient coordination of movements in space, breathing rhythm disorders, shuffling gait with feet apart; unclear laterality, motor slowness, movement accuracy disorders, poor evolution of complicated movements which are performed on the basis of verbal clues.

### **Conclusions of *STUDY NO. 1***

As regards the psychomotor development of pupils from special schools included in the research, we highlight an improvement at the level of all components, as an outcome of the complex program of kinetic stimulation applied in the kinetotherapy lessons:

- the results obtained at the test relating to the *body schema* register a **significant improvement** at the end of the experiment, although three of the subjects with associated disorders do not manage yet to recognize their segments; we mention that these subjects can work only with the help of the kinetotherapist;

- as to the *spatial and temporal orientation*, pupils encountered major difficulties at the initial testing, but at the final testing, the results emphasize a **significant difference** of the means, under the conditions in which one single pupils has not managed to progress;

- laterality, highlighted by the *Harris test* for establishing the hand, foot and eye dominance, recorded higher scores at the final testing, differences between the arithmetic means being **significant** from the statistical point of view;

- the results obtained in the *tests for intersegmental coordination and the coordination of upper limbs and lower limbs* reveal a significant increase, due to the appropriate stimulation program; at the final testing, all subjects achieved a greater or smaller progress in the tests for intersegmental coordination and that of the upper limbs, while in the test investigating the coordination of the lower limbs, four pupils did not manage to obtain any point out of the 20 possible points; we mention the fact that the **difference between means is significant** from the statistical point of view;

- the *Matorin test for general coordination and spatial-temporal orientation* emphasises good results at the final testing, especially at the test where the turning was performed to the right side, the biggest difference being of 250<sup>0</sup>, while five of the subjects investigated did not succeed in performing the test; however, the significance test proves a **significant difference** of the arithmetic means between the two testing phases;

- regarding the *manual dexterity*, assessed using the tapping test, we highlight a **significant increase**, from the statistical standpoint, of the arithmetic means afferent to the testing phases, the range of results being very extended, from 2 to 73 repetitions;

- the results obtained at the assessment of *static and dynamic balance* indicate a **significant increase**, from the statistical point of view, of the arithmetic means afferent to the two testing phases, although at the dynamic balance, investigated through the Bass test, one subject did not succeed in performing the trial even at the final testing;

- for the motricity trials, *standing long jump and trunk lifts from lying back*, the results at the final testing highlight a **significant difference**, from the statistical perspective, although the pupils' progress is very different, as to the values achieved.

As it can be seen, at all tests applied for the psychomotricity investigation, differences of the arithmetic means between the two testing phases indicate a statistically significant increase; we mention the fact the group's heterogeneity, from the age and diagnosis points of view, has greatly influenced the arithmetic means, the result amplitude being very big and the pupils' progress rate being different.

### **Hypothesis of the research for STUDY no. 2**

1. *Engaging the pre-schoolers with Down syndrome in organized, systematic and individualized physical activities facilitates their psychomotor development.*
2. *The family keeps the essential role in the maximum valorisation of the bio-psycho-social development potential of the child, despite his/her disability.*

### **Sample investigated**

The research was conducted on a sample made up of 19 children with Down syndrome, aged between 3 and 8 years, participating in the psychomotor stimulation activities organized by the Special Olympics Foundation of Romania, through the Young Athletes Program.

### **Organization of the research**

The Young Athletes Program was carried out over a 3-month period, in the halls within the UNEFS Bucharest. The sessions, with a duration of 45-60 minutes each, were performed rhythmically, twice a week. The content of the activities was established by the organizers of the program, each child benefiting by the direct surveillance of a volunteer.

### **Processing and interpretation of results**

The level of motor development and the progress rate were emphasized using the indicators of central tendency and the dependent T-test of significance.

In the present research, it was used a significance threshold of  $p = 0.05$ , in order to see the confidence level of the arithmetic mean, at a 5% risk.

### **Conclusions about the motricity, STUDY NO. 2**

Investigation of the initial level of motor/ psychomotor capacity of non-institutionalized children with Down syndrome, aged between 4 and 8 years, has revealed the fact that these ones present difficulties at the level of:

- stability skills, many being in the impossibility to stand on one foot or on tiptoes (one third of the subjects, usually the same);
- locomotion skills, especially the variants of walk with added steps, walk backwards, the variants of jumps - long jump and jump over obstacles;
- object handling skills, where problems were registered at both the execution of ball throwing with one or two hands, but also the ball catching.

At the end of the 3 months of intensive and individualized preparation, the children made progresses, recording higher values in the majority of tests applied. *Significant differences*, from the statistical point of view, between the two testing phases were recorded at the stability, locomotion and handling skills, except for the variants of ball catching and throwing, and also ball kicking, where the difference between means was not significant.

This may be due to the appearance of objects having different dimensions, colours and textures, with which the children tend to play at small ages.

We underline the fact that the group's heterogeneity has left its mark on the progress rate registered by the children during the months of preparation, however, all of them recorded a positive evolution, not only at the motor level, but also at the emotional and social ones.

#### **Processing and interpretation of results at the opinion questionnaire**

In order to assess the efficiency of the Young Athletes Program and the level of family's involvement/ support given to the child with Down syndrome, it was applied an opinion questionnaire, whose interpretation will be presented in the following lines:

The first category of questions puts into discussion the child, the way in which he/she manifests/ or not behavioural changes at the level of self-service skills, recreation activities, relaxation, manner of interacting with other members of the family or the group he belongs to. The other categories include "questions about the parent and family", "questions about the Young athletes at home", "questions about the program continuation".

#### **Conclusions about the questionnaire, *STUDY NO. 2***

The systematic participation of children with Down syndrome in motor activities was mainly ensured by the parents and other family members, usually by the grandparents.

At the end of the 3 months of activity, the parents filled in the opinion questionnaire, and their responses have highlighted the following aspects:

- the children are more present in the family, getting involved in new activities, either alone or together with their brothers, parents, etc.;
- they are more vigilant and can focus for a longer period of time;
- they are more cooperative with the other family members, but also with the children in the workgroup;
- they practice at home, by themselves or with other family members, motor structures demonstrated/ learnt within the Young Athletes Program;

- motor activities in the Young Athletes Program provided the children and their parents a new experience, meant to valorise each child's bio-psycho-social and motor potential;
- parents and extended family accept easier the child's disability and try to stimulate and make him/her responsible, in the limit of possibilities;
- children with Down syndrome are encouraged to practice sports and even to participate in competitive activities.

## CONCLUSIONS

Children with intellectual disabilities present important disorders at the level of perceptive-motor structures, both as regards the spatial-temporal organization and the dominant function of brain hemisphere, the body schema, the general, segmental and intersegmental coordination, as well as at the level of static and dynamic balance, which has negative effects on the learning/execution of fundamental locomotion, stability and handling skills.

The improvement of intellectual capacity is closely related to motor activity and, consequently, the complex programs of kinetic stimulation created and applied in order to educate the perceptive-motor structures have facilitated the child's involvement in diverse experiences resulted from the body-environment interaction and the achievement of some significant progresses in the psychomotor area.

The motor and psychomotor education of the child with intellectual disabilities, extremely important to his/her evolution and integration in society, must represent a permanent concern for the specialists, which imposes finding modalities of organization, methods and means whose combination ensures the activity efficiency.

Intellectual disability, associated to other disorders affecting the children included in the experiment, as well as the age, gender and genetic inheritance particularities, impose a motor stimulation/ reeducation strategy, in which the individualization is absolutely compulsory.

After conducting the experiment, the results obtained by the pupils from Special School no. 1, at the final testing, were superior to the initial ones, with statistically significant differences between the arithmetic means, for all components of the motor and psychomotor capacity investigated by us: body schema, spatial orientation, temporal orientation, general, segmental and intersegmental coordination, static and dynamic balance, abdominal muscle strength and standing long jump.

However, we consider that the number of kinetotherapy lessons in special schools is insufficient, and the weekly activity with one or two pupils, out of a classroom with a minimum group of 15 pupils, do not ensure a corresponding stimulation, despite the effort made by the specialist to individualize the practice.

We emphasize the remarkable results obtained by the children with Down syndrome who have participated in motor stimulation activities within the Young Athletes Program, over a period of only 3 months, the advantage being given by their relatively small age (4 to 8 years), the individualized work and the support of their families.