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Games and Didactic Exercises to Promote Graphomotor Development in Preschool Children in Children with Intellectual Disabilities

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Abstract

The present work offers a proposal of games and exercises to develop fine motor skills in children aged 4 to 5 with intellectual disabilities, based on the preparation of the educator and the family who interact with them. Fine motor skills during the preschool stage start from the acquisition of experiences from previous ages to act with objects with greater precision and dexterity that will allow them to reach other contents that expand their knowledge, such as writing. Methods of the theoretical level and the empirical level were used, which helped to reveal the results of the diagnosis. The application of these games and didactic exercises can promote the development of fine motor skills in these children, which will influence a better preparation of these for higher learning.

Keywords: Graphomotor Skills, Preschool Age; Games

Introduction

Among the various activities that humans do, there are some that require great precision and coordination, such as writing. These skills are part of motor skills; that is, movement, motor behavior, motor skills, psychic development and social development. Motor skills is one of the activities considered relevant in the field of school life, as they facilitate others such as: writing, eating, using the computer, tying shoes, turning the pages of a book, properly grooming, combing hair, among others.

The systematic practice of physical exercises carried out correctly contributes favorably to the creation of habits and motor skills, to the strengthening of health, to raising the performance capacity and at the same time to the multilateral, harmonious development of the personality of children; It gives the little one joy, satisfaction when interacting with other children and adults, regulating behavior to feeling useful, cooperating with others planning and organizing games.

Psychomotor development is very important in the comprehensive education of children, since it is defined as the maturity of the psychic and motor aspects of the human being, which leads children to develop better in the environment that surrounds them [1]. Currently, psychomotor development occupies an important place in education; this is reflected in the learning routes in the area of social personal in which it is evidenced in the competencies, capacities and indicators that children must achieve.

Most of the skills that begin at this age allow the child to access a more complete and comprehensive development in the next school levels, as happens, for example, with writing. In preschool, it is required that upon completion the child be in

a position to execute continuous strokes with some precision, adjusting to the line and to reproduce the shape correctly. According to the feature, all of which constitute calligraphic skills that are based on interaction of the perceptual-motor factors, the sociocultural experience, as well as the organization and direction of a teaching-educational process, which meets the necessary methodological requirements based on a complete and generalizing orientation.

The first manifestation of motor skills is play and as it develops, it becomes more complex with the stimuli and experiences lived, generating increasingly coordinated and elaborate movements. Children go through different stages before making a move. When their movements are born they are involuntary, then they become more rustic movements with little coordination and later they are capable of more controlled and more coordinated movements.

Children with intellectual disabilities are capable of making mental representations of what they see and observe, closely linked to their experiences and experiences, but it is more difficult for them to learn, understand and communicate than others. The ability to represent graphically, through drawings, the reality they see is also developed through stages or processes. For this reason, the activities will have an order of increasing complexity, for example, those that involve movements for modeling, paper crumpling, free tearing, will be easier than those for cutting or coloring; drawing straight lines will be easier than drawing circular shapes; modeling cylindrical shapes, throwing, capturing will be less complex than drawing round shapes or small details of an object.

It's important pointing that:
Intellectual disability is not a mental illness.
Children with intellectual disabilities are citizens like the rest.
Each of these children has particular abilities, tastes, dreams, and needs, just like other children.
All children with intellectual disabilities have the possibility of progress if we give them the right supports [2].

Throughout the preschool age, different activities are developed that contribute to the development of the hand and with it that of fine motor skills or graphomotor skills. This paper is concerned with fine motor skills in children 4 to 5 years with intellectual disabilities, because of the attention to stimulate the writing, although it is known that the adoption of the position of digital clamp occurs at younger ages as a sign of the presence of fine motor development in infants from 0 to 3 years old. However, in children between 4 and 5 years old, greater control of their performance has been acquired, which allows them a higher level of independence [3].

Various investigations have been carried out on the subject, for example: Pérez, et al. [4] and Fuentes, et al. [5]. But these works are aimed at the development of motor skills and emphasize the importance of the psychomotor area in the intellectual development of the child. Other authors such as Yero, et al. and Ruiz, et al. [3,6] have addressed motor skills, the first author proposes a group of actions for the family and the second a proposal of exercises and games for the development of motor skills, But in none of the cases is a methodology taken into account that allows for a better preparation of teachers and the family in this regard.

Research carried out by Galdámez, et al. [7] related to the motor skills of children from 1 to 6 years of age with intellectual disabilities refer to motor achievements in gross motor skills; however, fine motor skills are not addressed, elements that the author considers important to determine in order to assess how well this child is prepared for higher learning related to manual skills, specifically writing.

Materials and Methods

In spite of the research and work done, shortcomings are still in the development of fine motor skills in children with intellectual disabilities in the constituency 94 of the People's Council "Heredia" in the center of the city of Santiago de Cuba. De hence the need for the study of the subject, because investigations as effectual to s not exhaust all care areas. The express desire of this work is to offer guidance to the executors and families of these children, to achieve a better and more varied spectrum of work in the development of fine motor skills.

Zausmer cited by Archila, et al. [8], made the following statements and criteria:
Stimulation of fine motor skills (hand muscle) is essential before learning to read and write. If we analyze that writing requires motor coordination and training of the hands, we realize that it is of utmost importance that teachers perform a series of exercises, sequential in complexity, to achieve mastery and dexterity of the fine muscles of the fingers and toes hands.

Ajuriaguerro, et al. [9] expressed that in the exercises to develop fine motor skills, techniques that classify in graphs and not graphs should be used. The first ones are defined by the author as exercises to develop the fine motor skills necessary for learning to write and the non-graphic ones are characterized as those exercises aimed at improving precision, coordination, speed and control of hand movement. The so-called non-graphic techniques are: stringing, fitting, buttoning, braiding, trimming, gluing, tearing, assembling, closing and shaping.

It is necessary to bear in mind that the principles that govern graphomotor development are:

Ontogenetic approach: it is related to the stages of evolution of graphics, analyzing the chronological appearance of the lines starting from their initial similarity with the real objects of life and their later stylization until reaching the current spellings and numbers. It takes into account how the use of graphic support evolves and how children's ideas about writing evolve. This principle requires that the realization of simple graphomotor actions precede the more complex ones, in such a way that the graphemes are organized from the easiest in their link with drawings to the most difficult or abstract

Approach to motor conditioning: it requires the execution of diverse and systematic sensory-motor acts, using the possible sensory systems, which leads to the formation of proprioceptive schemes.

Integrative approach: it is related to the dialectical integration of skill and meaningful learning approaches, this allows children to actively build their skills in the realization of graphemes in interaction with adults and their peers, giving a special value to these In addition, of these principles in the graphomotor development of children, the postulates of l must be taken into account. Vigotsky S, et al. [10] on the generic law of psychic development, the actions by the social significance of writing [11].

Relationship between affective and cognitive processes and teaching as the main source that leads to development [12].

The bibliographic antecedents consulted allowed us to observe the educational practice with these children with intellectual disabilities who present **b** in pre-writing activities, for example:

- Imprecision in the drawing of figures and graphemes
- Lack of visual-motor coordination
- Slowness in the path
- Lack of control in the muscles of the hand

From the initial diagnosis, it was possible to verify the need to reinforce the graphomotor development in the children of the sample, for which these games and didactic exercises have been developed. It is conceived as a **scientific problem**: How to enhance the development of graphomotor ability in children with intellectual disabilities between 4 and 5 years of age through the teaching-learning process? The following **object of study** is proposed: the teaching-learning process of graphomotor development in children in children from 4 to 5 years old with intellectual disabilities. It is the **objective**: to develop a methodology for development graphomotor in children 4 to 5 years with intellectual disabilities, based on a c methodological oncepción of this process of teaching and learning, composed of four basic components that make up a system for the interrelationships they are established between them, depending on the fulfillment of the purpose of the whole system [13-15].

Research is considered **hypothesis**: if a methodology for developing development applies graphomotor children 4 to 5 years with intellectual disabilities, based on a c methodological oncepción that requires components and interrelationships of the process, it will promote the preparation of teachers and families for greater motor graph development in children from 4 to 5 years old.

The research has a quantitative and qualitative approach, in its theoretical and empirical methods were used, within them we must highlight.

Theorists

- **Analysis-synthesis:** used to interpret the theoretical assumptions related to the research topic, the analysis of the most current contents concerning the teaching-learning process of graphomotor development, so that its internal relations and the generalizations emanating from the judgments and evaluations related to the object of study of the research.
- **Inductive-deductive:** to make the necessary referrals in relation to the particularities of the process concerning graphomotor development in children with intellectual disabilities aged 4 to 5 years with intellectual disabilities. **Systematization: it** was used to assess the approaches that prevail in the main theoretical nuclei of the research, which made it possible to organize, interrelate and interpret knowledge in a systematic way.

Empirical

- **Note:** c on the purpose of checking: the graphomotor skills of children with disabilities intellectual, the preparation possessing teachers and family to provide treatment to graphomotor development through joint activities performed by children with intellectual disabilities .
- **Documentary analysis**: which was used in order to understand the guidelines of the methodological department of the National Institute of Sports, Physical Education and Recreation (INDER) and the methodological indications and current guidelines for physical activity in the country, as well as other official documents related to the object of study of the research
- **Measurement test:** to assess the current state of children with intellectual disabilities aged 4 to 5 years in terms of the development of their motor graph.

Mathematical-Statistics

- **The measurement method:** which was applied to measure, using the selected instruments, the behavior of the different indicators included in the test for the development of psychomotor skills?
- **The statistical methods** used in the research were used to process and interpret the results and allowed to establish with certainty the effects of the proposed methodology when applied to the selected sample.

The intentional **sample** was represented by 49 (23 boys and 26 girls). 81.6%, 15 of 4 years; 34 of 5 years for 81.6% who belong to constituency 94 of the Popular Council "Heredia", of Santiago de Cuba. The intentionality of the sample was determined by the condition of intellectual disability, the difficulty in graphomotor ability and the willingness of the parents to include them in this study.

- For the analysis of graphomotor development, the following **dependent variables** were required**:** Flexibility and rotation of the wrists.
- Thumb work
- Finger movement to the right, to the left or to the front
- Thumb work with the rest of the fingers
- Flexibility of the fingers
- Visomotor Link
- The **dependent variables** were determined by sex, age and intellectual disability present in the children in the sample.

Discussion and Results

To facilitate the execution of the skills of fine motor skills, play has an important place, although direct exposure to a certain activity or interaction with experienced adults who place themselves between the child and the external origins of the child can also be used stimuli, in order to facilitate appropriate learning blocks and habits, generally.
In carrying out these games, the theoretical-methodological foundation of the "Psychopedagogical Program for the graphomotor development of preschool children" structured in three sections was also analyzed. It was considered to include the game proposal in the first two work sections of the program, since in the third there are the family orientation activities, in which they can be inserted from their validation and final generalization.

The teaching aids will be varied in correspondence with the exercises and games that children are going to perform to execute the fine movements of their hands, which can be plasticine, colored pencils, tempera, crayon, newspaper and colored papers, balls, flags, canes or any object that does not represent a danger to the child, you can also use your own hands to perform finger games.

Performers will demonstrate to families how important finger games are to achieving an agile and flexible hand, for example, opening and closing the hands to a rhyme or song, drumming with the fingers as if playing piano keys, make pairs with the fingers of each hand and join them and wait for them at intervals, make small translation movements with the fingers imitating the forms of locomotion of some animals.

Observation of the Activities of Children from 4 to 5 Years old with Intellectual Disabilities

Twenty observations were made of the jointly programmed activities with children from 4 to 5 years old with intellectual disabilities; it was possible to see that the relationships between the executor-family-children have quite a lot of quality, but not enough. Of the 20 observations made to the joint activities, in 4 for 36, 4% the families were guided what they were going to do and how they would do it, in the remaining classes, in 3, 27.3% of the families corresponding were not very satisfied, which indicates that there are still gaps in terms of orientation.

In 15 of the activities that represent 75% of the classes observed, it was possible to verify the good disposition of the family in the best development of their children, although there is still a lack of good conditions to carry out the activities, there is little use of teaching aids, ignorance of the games and didactic exercises that have been previously planned with the aim of developing motor skills, some are used but sometimes with ignorance that they develop motor skills

It could also be seen that of the 20 activities observed only in 4 for 20% physical exercises aimed at the development of graphomotor skills were used, the remaining 3 for 15% carried out exercises that were directed to the development of plastic education. Poor use of games and didactic exercises was observed in these classes. In general, 5 activities were observed for 2 5%. Apathy and disinterest on the part of the children for these activities was verified, representing 18.2%. In children with intellectual disabilities, lack of motivation and lack of interest are frequent characteristics. To this is added the inexperience of the executor and the little knowledge of the families about the use of these games and exercises for the development of graphomotor skills.

This Table 1 summarizes the results obtained from observing the behavior of the variables in the observed activities.

Order	Ability to execute	Amount to be due	Number of overdue tasks	Female	Male	% of the test
1	Flexibility and rotation of the wrists	eleven	8	8	6	72
2	Thumb work	14	12	10	9	85
3	Finger movement to the right	22	8	3	6	68
4	Finger movement forward	25	7	5	2	28
5	Finger movement to the left	8	2	2	2	25
6	Thumb work with the rest of the fingers	5	3	**3**	**2**	60
7	Flexibility of the fingers	4	3	**3**	**3**	75
8	Visomotor Link	6	5	4	3	85
Total		**95**	**48**	**38**	**33**	**fifty**

Table 1: Results obtained from observing the behavior of the variables in the observed activities.

Based on these results, the methodology for the orientation of didactic games was applied in order to develop graphomotor skills in children between 4 and 5 years old with intellectual disabilities.

Methodology for the orientation and performance of the game:

- **Game statement**: announce the name of the game. Enunciation, it consists of the conversation or narration, in order to interest the child in the activity, sometimes the success of the game will depend on a good motivation. On the other
- **Motivation and explanation of the game:** it will be carried out immediately after th hand, the explanation must be simple, understandable, using the audiovisual media of the games, where all the actions that will be carried out during the game are expose
- **Organization:** in this case, what concerns the distribution of participants is included, according to needs
- **Materials:** materials necessary to carry out the game as long as the materials do not constitute a danger to the child.
- **Demonstration:** in this step the game will be explained in a practical way.
- **Initial practice of the game:** once the game has been demonstrated, there will be a small practice.

In section A., called "System of diagnostic tests", it is dedicated to evaluating some aspects such as: perception of shape and visual memory, body awareness, orientation in one's own body, orientation according to an external reference point, coordination visomotor, lines for free drawing and postural requirements for the correct position when writing, among others. In this direction, the following are proposed as games to achieve these ends in this section:

Carry out role plays that reflect actions such as: taking the herbs out of the garden, selecting the ripe fruits to sell in the little square, cutting out strips of paper to decorate the room, imitating with the fingers how the water falls from the shower when the farmer waters plants on the plot, cordon off shoes, play barber or hairdresser, cook, peel food, wash vegetables, choose rice, scratch cassava, wash in the tub.

These games provide: flexibility to the wrists, the work of the index with the thumb, joining the thumb with the rest of the fingers and making the movement to the right, to the left or to the front will give flexibility to the fingers and the doll.

In section B, dedicated to "Activities for graphomotor development", the tasks of free drawing, execution, monitoring, and filling of arabesques, modeling, tearing, cutting and monitoring of graphics are integrated (using rods on the ground, brushes and cardstock, finger on blackboard, with chalk on blackboard). The games considered for the achievement of these skills are:

Go to touch the wall with one arm, place the hand on the head, ask them to wave with one hand, scratch their heads, make the fingers of one hand coincide with those of the other, draw geometric figures on the floor, color drawings without leaving the path, draw continuous and discontinuous lines.

The games that are presented have a collaborative nature, because in agreement with the teacher and the physical culture specialist-advisor they can be coordinated from the beginning of the preschool grade, guaranteeing that the children acquire the adequate graphomotor development to achieve greater efficiency in the process calligraphic skills

training that guarantee a favorable future in learning to write.

In addition to the games presented, some exercises that children from 4 to 5 years old with intellectual disabilities can do are recommended to develop their fine motor skills. For example: hand and finger movements without the use of instruments.

- Open and close the hands with the fingers joined.
- Touch the pad of the thumb to the pad of the rest of the fingers. Movement of the index finger in different directions (up, down, left, right).
- Join and separate the index and thumb, imitating the beaks of the birds at a slow and fast pace.
- Type your fingers on the table starting with the thumb and ending with the little finger first slow and then fast.
- Join the palms of the hands and imitate greetings of the fingers, the hands caress each other, the hands embrace.
- Separate and join the fingers of one hand first and then the other. Make movements of the wrist in different directions.
- With your hand on the table, lift and lower your fingers one by one. Thread, button, cordon, crease and unroll paper.
- Twist paper.
- Free ripped, pinch ripped. Glued paper.
- Paper folding.
- Pleated following a knitted line.
- Model plasticine in a cylindrical and round shape.
- Movement of the hands with the use of instruments.
- Draw straight and circular shapes with brushes, crayons, pencils, chalk, with sticks on the ground or in the sand.
- Color different figures drawn by them.

The methodology for graphomotor development in children aged 4 to 5 years with intellectual disabilities has a system character, since its purposes can only be achieved through the set of elements that constitute it and their relationships, which is impossible to achieve with the mere independent sum of each of them.

After applying the methodology, it was possible to verify the quality jump in the execution of the programmed exercises. Of the variables evaluated the flexibility and rotation of the wrists, the movement of the fingers to the right, to the front and to the left, the work of the thumb with the rest of the fingers and the flexibility of the fingers were the ones with the highest score with an execution between 85 and 90%. However, the work of the index with the thumb (clamp) only reached a performance of 60% and the visual-motor link 45%. These results show that although a significant advance was experienced in the development of graphomotor ability in these children, there is still a challenge to be met in the monitoring of these exercises and games by the educational institution and the family.

Conclusion

The study carried out allowed corroborating the importance of the development of fine motor skills in preschool children to stimulate their subsequent foray into writing. Acting with objects with greater precision and dexterity allows them to perceive other contents that expand their knowledge and that are not always taken advantage of due to the ignorance and lack of preparation of the executors and family.

Stimulation of fine motor skills (hand muscle) or graphomotor skills is essential before learning to read and write. Writing requires coordination and motor training of the hands that can be stimulated from the games and exercises proposed, sequential in complexity, to achieve mastery and dexterity of the fine muscles of the fingers and hands in preschool children.

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