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Translated from the original in spanish **Original article**

Psychomotor games: an important role in children aged three to four years

Los juegos psicomotrices: un rol importante en niños de tres a cuatro años

Brincadeiras psicomotoras: uma função importante para crianças de três a quatro anos de idade

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ABSTRACT

Promoting the stimulation of motor development for children aged three to four years and taking advantage of the potential of the *Educa tu Hijo Program* through the role of families, the community and teachers are considered premises for the development of creative thinking that includes the role of games in comprehensive training, based on the execution of basic motor actions. Therefore, it was proposed as the objective of the research design a system of psychomotor games for children aged three to four years of the *Educa tu Hijo Program* that promote their psychomotor development. This gave the possibility of training family members, the community and teachers with an integrative training approach to motivate motor learning. The games created showed good creative practices, they included actions to express the feelings and desires of the selected sample. The theoretical methods used to evaluate the topic were analysis-synthesis, inductive-deductive and systemic-structural-functional, the empirical ones were documentary analysis, observation, interview with teachers, family survey, as well as mathematical-statistical methods. Therefore, it has been concluded that psychomotor games, if planned appropriately, have a positive impact on social relationships, cognitive, language, feelings and the ways in which family members, the community and teachers interact. prepare to enhance the comprehensive education of their children.

Keywords: psychomotor development, stimulation, psychomotor games.

RESUMEN

Promover la estimulación del desarrollo motriz para niños de tres a cuatro años y aprovechar las potencialidades del *Programa Educa a Tu Hijo* mediante el papel de las familias, la comunidad y los docentes se consideran premisas para el desarrollo del pensamiento creativo que incluye el papel de los juegos en la formación integral, a partir de la ejecución de acciones motrices básicas. Por lo que, se propuso como objetivo de la investigación diseñar un sistema de juegos psicomotrices para los niños de tres a cuatro años del *Programa Educa tu Hijo* que favorezcan su desarrollo psicomotor. Esto, dio la posibilidad de capacitar a familiares, comunidad y docentes con un enfoque formativo integrador para

la motivación del aprendizaje de la motricidad. Los juegos creados dieron muestra de buenas prácticas creativas, incluyeron acciones para expresar el sentir y el deseo de la muestra seleccionada. Para evaluar la temática fueron empleados los métodos teóricos análisis-síntesis, inductivo-deductivo y sistémico-estructural-funcional, empíricos análisis documental, observación, entrevista a los profesores, encuesta a la familia, así como métodos matemático-estadísticos. Por lo que, se ha llegado a la conclusión que los juegos psicomotrices, si se planifican de manera adecuada tienen un impacto positivo en las relaciones sociales, en lo cognitivo, el lenguaje, los sentimientos y las formas en que familiares, comunidad y docentes se preparan para potenciar la formación integral de sus hijos.

Palabras clave: desarrollo psicomotor, estimulación, juegos psicomotrices

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RESUMO

Promover a estimulação do desenvolvimento motor de crianças de três a quatro anos e aproveitar as potencialidades do *Programa Eduque Seu Filho* por meio do papel das famílias, da comunidade e dos professores são considerados premissas para o desenvolvimento do pensamento criativo que inclui o papel dos jogos no treinamento integral, baseado na execução de ações motoras básicas. Portanto, o objetivo da pesquisa foi propor um sistema de jogos psicomotores para crianças de três a quatro anos do *Programa Educa tu Hijo* que promovam seu desenvolvimento psicomotor. Isto deu a possibilidade de treinar familiares, comunidade e professores com uma abordagem de formação integrativa para motivar a aprendizagem motora. Os jogos criados apresentaram boas práticas criativas, incluíram ações para expressar os sentimentos e desejos da amostra selecionada. Para avaliar o tema foram utilizados os métodos teóricos de análise-síntese, indutivo-dedutivo e sistêmico-estrutural-funcional, análise documental empírica, observação, entrevista com professores, inquérito familiar, além de métodos matemático-estatísticos. Portanto, concluiu-se que os jogos psicomotores, se planejados de forma adequada, têm impacto positivo nas relações sociais, cognitivas, na linguagem, nos sentimentos e nas formas como os familiares, a comunidade e os professores interagem.

Palavras-chave: desenvolvimento psicomotor, estimulação, jogos psicomotores

INTRODUCTION

Currently, the stimulation of initial education through the *Educate your child Program* is considered a significant process, in which teachers, families and the community are integrated from a theoretical-practical construct to implement well-planned actions for motivation towards the practice of motor and cognitive skills at this stage. Children from three to four years of age must adequately and progressively develop language, knowledge of themselves and their body, through social interaction, to promote the full enjoyment of physical and mental health.

The importance of psychomotor stimulation in childhood has strong theoretical bases and updated empirical evidence and there has been a resurgence of interest in the study and stimulation of psychomotor development from an ecological perspective, in particular, cross-cultural comparisons of motor achievements (Keller, *et at.*, 2016).

Consequently, stimulation is seen as a set of actions that favor the child's physical, mental and psychological abilities in a systematic way, made up of a group of exercises that provide the experiences necessary to reach a high intellectual potential.

This is possible if the joint activities of the *Educa tu Hijo* program carried out in the community are recognized in the educational context; this idea is based on Vygotsky's theories (cited by Rodríguez and Ríos, 2016). Therefore, these authors consider the educational context as the essential space for the development of a more effective interaction in the construction of knowledge, which allows the student to solve learning tasks mediated by the teacher.

The game stimulates the child's motor development, as it constitutes the driving force to carry out the desired action. For example, a baby who wants to pick up an object that is far away has to crawl to get to it, use his muscles, his gross motor skills; in addition to providing the child with pleasure and moments of distraction, play is an activity that stimulates and activates different components of child development.

In the same way, it constitutes the scenario in which they can practice the experience of measuring their own possibilities in the different situations of their life and that influences all areas of human development, so there will be different contributions such as:

a) Contributions to cognitive development: the game activates the child's cognitive skills, as they allow them to understand their environment and develop their thinking.

b) Contributions to social development: it allows children to learn to cooperate and show socially acceptable behaviors, to interact with each other, they learn to give and receive, to compete, self-regulate, and talk about their emotions.

c) Contributions to emotional development: the child decides the life of the characters in his games: what they do, for how long, in what way, who is involved. He also lends them his feelings and emotions - the expression of himself -. On the other hand, the emotional balance that is achieved with the game is a pleasant state that it is always tended to seek.

d) Contributions to motor development: the game stimulates the child's motor development as it constitutes the driving force to carry out the desired action.

In this line of thought, Fernández (2004), Ramos *et al.* (2016) and Pentón and Piñeda (2018) state:

> Motor skills consider movement as a means of communication, expression and relationship with others, having a fundamental role in the harmonious development of personality, because boys and girls not only develop their motor skills, but also allow them to integrate thinking, emotions and socialization. (p.87)

Psychomotor skills are the technique that helps children and babies master their body movements in a healthy way, as well as to improve their relationship and communication with others. The main benefit it has in the childhood stage is the strengthening of physical and mental health, it is talked about childhood psychomotor skills until the age of seven.

Researchers like Aguilar *et al.* (2022), Cabrera and Dupeyrón (2019), Cobos (2007), Díaz and Yagüe (2017), House (2013), Núñez and Quiñonez (2020), Pol *et al.* (2021) and Tapia *et al.* (2014) provide elements to take into account when working with the areas that contribute to the development of psychomotor skills such as body schema, laterality, balance, space, time-rhythm, gross motor skills and fine motor skills.

Despite the great efforts made by researchers to help children between three and four years old to achieve high motor and mental development, the results achieved in the *Educa tu Hijo Program*, at the Versalles sport complex, are still insufficient. To respond to the problem raised, the objective is to develop a system of psychomotor games for children aged three to four years of the *Educa tu Hijo Program* that promote their psychomotor development.

MATERIALS AND METHODS

The methods were selected in accordance with the objective of the research. The theoretical ones were:

- Analytical-synthetic: for the examination of the theoretical sources that allowed to delve deeper into the problem posed and the evaluations of the results obtained with the implementation of the neurological bases.
- Systemic-structural-functional: allowed the design of motor games for psychomotor development in children aged three to four years, based on the consideration of their parts, functions and relationships between them.

The empirical ones were:

- Document analysis: it was used in the review of the *Educa a tu hijo Program* and the Preschool Education Program, third cycle, 4th and 5th. years of life of the Children Day care centers, as well as scientific research carried out to determine the insufficiencies of the program with respect to psychomotor motor development.

- Observation: to the activities carried out by teachers, to verify the treatment they give to psychomotor development.
- Interview with teachers: allowed to analyze the preparation of teachers regarding motor games and the use of teaching aids for the psychomotor development of children between three and four years old in the *Educa a tu hijo Program*.
- Family survey: it was applied to the families of children between three and four years old incorporated into the *Educa a tu Hijo Program*, to obtain information about their preparation to contribute to the psychomotor development of their children.
- Measurement test: The tepsi sereening screening test was used to evaluate the current status of the three- to four-year-old children of the Program in terms of psychomotor development.

As a mathematician-statistician method, the percentage calculation was used to analyze the results obtained in the diagnosis and in the assessment of the feasibility of the exercises.

These methods made it possible to verify the problems presented by the object of study, facilitating the obtaining of information and its processing for the application of the proposal, as well as the validation of its results.

The motor games and exercises proposed were applied in a flexible manner, which made it possible to assess their application in other contexts, based on respect for the ethical standards required in research of this nature.

The diagnosis was carried out in the Versalles Community and had a population made up of 10 teachers, 60 families and 28 children of both sexes. Using simple random sampling, 10 teachers, 20 families and 28 children were selected as a sample (15 boys representing 42% and 13 girls representing 46 %). With three years old, six children that represent 21 % and 22 with four years old, representing the 78 %.

Indicators established in the *Educa a tu Hijo Program* are assumed and contextualized; these respond to a qualitative methodology and allow quantitative value to be given to the indicators and evaluations made of them.

1. Children's motor skills.
2. Preparation of teachers.
3. Family contribution.

The children studied are female and male. The background of the children was investigated when carrying out the tests evaluated with the coordination of the CDO, none has history of mentally retarded, only three have low weight.

RESULTS AND DISCUSSION

An analysis of psychomotor development was carried out in the area of motor skills of children from the *Educa a tu Hijo Program*, from Versalles sport complex, where it was evident that psychomotor skills development is in the normal category (80 %), at risk the 78 %, the 13 % is in the category of mentally retarded, the male sex is the most affected in balance and coordination (Table 1).

Table 1. - Level of psychomotor skills development

Motor indicators	**Female**		**Male**		**Total**	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Normal	10	76	2	15	12	80
Risk	10	76	12	80	22	78
Mentally retarded	1	7	1	7	2	13
Total	13	100	15	100	28	100

In the survey carried out on the 20 families, it was found that 100% have a lack of knowledge about the psychomotor skills development of their children and the need to receive appropriate guidance to reach levels of preparation regarding the topic studied. Likewise, 14 families, representing 70 %, are usually absence from the joint activities of the Program, which negatively influences their preparation (Table 2).

Table 2. - Results of the family survey

Indicators	Psychomotor development level							
	Good	%	Average	%	Poor	%	Total	%
Knowledge about psychomotor skills development	x	x	x	x	20	100	20	100
Participation in joint activities	14	70	x	x	x	x	14	70
TOTAL	14	70	x	x	x	100		

It could also be seen that of the 20 activities observed, only four (20 %) used physical exercises aimed at psychomotor development, the other three (15 %) carried out exercises that were aimed at the development of plastic education.

The preparation of the teachers was appreciated in the class evaluations, where seven of them (70 %) were evaluated as average and three (30 %) as poor, which demonstrated the need for deeper and more effective preparation (Table 3).

Table 3. - Results of teacher observation

Indicators	Evaluation scale							
	Adequate		Not very suitable		Inadequate		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
Exercises used for motor skills	4	20	8		84	42		
Activities for motor skills used	1	10	x	x	x	x	1	10
Application of motor teaching aids	x	x	6	60	x	x	6	60
Teacher preparation about motor skills	x	x	x	x	3	x	3	30
Total	1	10		60	3	x	100	100

With the application of the methods used in the diagnosis, the scientific problem of the research was ratified, given the existence of limitations in the teaching-learning process for psychomotor skills development in children aged 3 to 4 years of the *Educate your Child Program.*

The relevance of the system of psychomotor games aimed at the preparation of teachers and families was determined through the instrument (expert judgment method); functionality through pre-experiment.

For the development of the expert judgment method, the stages described by Mesa (2021) are assumed.

The 26 possible experts were identified, of which after processing the competence coefficient, nine characterized experts were selected: PhD, six in Physical Culture Sciences (66.6 %) and two in Pedagogical Sciences (22.22 %), a master's degree in Pedagogy of Sports and Physical Culture (11.11 %) (Table 4).

Table 4. - Results of the experts' competence coefficient

Experts	Coefficient of knowledge information	Argumentation coefficient	CCoefficient competence	Experts	Coefficient of knowledge information	coefficient of argumentation	Coefficient of competence
1	0.8	0.9	0.85	16	0.9	0.85	0.85
2	0.9	0.8	0.85	17	0.8	0.9	0.85
3	0.8	0 0.8	0.8	18	0.9	0.85	0.8
4	0.8	0.8	0.8	19	0.8	0.85	0.8
5	0.9	0.8	0.85	20	0.8	0.85	0.85
6	0.9	0.9	0.9	21	0.9	0.9	0.9
7	0.9	0.7	0.85	22	0.9	0.9	0.8
8	0.8	0.8	0.85	23	0.9	0.7	0.8
9	0.8	0.8	0.85	24	0.8	0.85	0.8

After this step, nine items are answered by the experts; using the following qualitative scale: MA- very suitable, A- suitable, PA- not very suitable, I- inadequate (Table 5).

Table 5. - items are answered by the experts

Items	C1	C2	C3	C 4	addition	AVERAGE	NP
P1	-0.46	-0.04	1.13				
P2	0.37	0.65	1.30	1.32	3.62	0.91	.051
P3	-0.99	0.75	-0.37	0.29	-1.82	-0.46	.0.86
P4	0.51	0.12	-0.25	0, 0.85	2.17	0.54	-0.14
Cut points	-0.41	-0.005	0.70	1.73	8.09		

The statistical processing of the questionnaire related to the quality of the proposal is using Kendall's concordance coefficient (W) (Table 6).

Table 6. - Agreement of expert criteria

N	KENDALL'SW	CHI - SQUARE	D.F.	ASYMP. NEXT
9	.178	18,742	8	0.013

Source: Prepared by the authors based on the Statistical Package for the Social Sciences program (IBM ®SPSS 20.0)

The process allows analyzing the level of agreement between the experts with respect to the established parameters. For this procedure, the following is first established:

1. Problem, aimed at: knowing if there is agreement between the criteria issued by the experts on the different parameters, then the hypotheses are established that will allow to contrast whether there is agreement, being:

2. Hypothesis:

- H0: There is no agreement between the criteria issued by the experts.

- H1: There is agreement between the criteria issued by the experts.

After the step, the author of the research defines the level of significance and confidence with which. The work was done with: $\alpha = 0.05$ with 95 %. Comparison: $0.013 < 0.05$

The last step is the statistical interpretation: when considering the verified results, it is decided that: the low probability according to H**0** associated with the observed value of W (0.013), allows to reject the null hypothesis expressed; for a predetermined alpha value of five percent significance; verifying that there is agreement between the criteria issued by the experts on the theoretical-practical proposal, submitted for their consideration.

On the other hand, the feasibility of its implementation in teachers and families selected as very suitable was evaluated. The points and recommendations allowed to refine the designed proposals.

Questionnaire for the validation of the system of psychomotor games aimed at the preparation of teachers

and families through expert judgment.

Although the general assessment issued by the experts is favorable in all indicators, a set of suggestions were compiled that allow to enrich the proposed instrument, these are listed below:

- Improve the use of methods and procedures that allow greater participation of children in joint activities from Physical Education.
- Increase the preparation of Physical Education teachers from the undergraduate level.
- Increase actions for the systematization of activities for the home.

The characterization of the current state obtained through the application and assessment of the results achieved in the diagnosis showed the need for a system of psychomotor games aimed at the preparation of teachers and families. through different joint activities

Game 1: Name the footprints.

Objective: develop gross motor skills, balance and coordination.

Organization: rows.

Materials: to create it, it is simply needed some colored cardboard with which to make the footprints or draw it with chalk on the ground, in this way they will learn spatial concepts such as left and right, it can be also included the silhouette of the hands so that the game is more complete and works more muscles.

Development: children will jump with one foot over the handprints and foot prints that will be placed on the floor.

Rules: He/she must jump on one foot over the footprints.

Game 2: The wheelbarrow.

Objective: develop gross motor skills.

Organization: duos and rows.

Materials: flags.

Development: it is done in pairs; one child takes the other by the legs and the other moves to the front.

Rules: he/she must move with his/her hands and reach the goal.

Game 3: Bowling.

Objective: develop fine motor skills.

Organization: front.

Material: bowling pins and balls.

Development: the children will be placed at a distance of 1m, from a line they will throw the ball to knock down the pins, the children will be able to identify and know each of the colors, as well as work their arms and legs in the throw to coordinate movements with the intention of throwing as many pins as possible.

Rules: throw with one hand.

Game 4: My favorite animal.

Objective: development of fine and gross motor skills.

Materials: with prior guidance, children are told that they should bring toy animals and teaching aids of the animal they would most like to imitate.

Organization: front, they are grouped according to the characteristics of the groups related to each other. They will work collectively in the team, exchanging ideas, organizing the logical ideas of the situation.

Development: children will imitate various animals.

Rules: they must imitate the animal correctly.

Game 5: Walking on the rope.

Objective: develop fine motor skills.

Materials: bench.

Development: balance on a bench: a continuous bench, you can make them exercise their legs, coordination and balance, suggesting that they walk on it without falling, as if they were tightrope walkers. If there is no a bench, you can also create lines on the floor with colored adhesive tape and ask the children to follow them without leaving them, look for ways to bring the group closer together, if they already know each other, create an activity related to your imagination.

Rule: They cannot leave the bank.

Application and evaluation of the functionality of the psychomotor game system aimed at the preparation of teachers and families during the pre-experiment

For the evaluation of the proposal, the typology assumed by Hernández et al. was considered. (2014), it consists of the pre-experiment, the pure experiment and the quasi-experiment. During the application of the pre-experiment, the theft criteria are assumed (2012), who defines two moments for its execution:

Moment 1. Organization of the pre-experimental design.

The objective of the pre-experiment was defined as: to evaluate the functionality of the psychomotor game system aimed at the preparation of teachers and families.

The indicators established to determine the didactic preparation of teachers and families who apply the *Educa a tu Hijo Program* were established by operationalizing the variable in which they are determined, regarding the theoretical and didactic knowledge of the teachers. It was conceived from the analysis of the initial and final control in order to guarantee the validity of the results.

The evaluation of the pretest was aimed at mastering the knowledge and knowledge that the teachers have on the topic. To evaluate the results obtained in the evaluation of the teachers, the indicators proposed by Martín (2021) were taken into account, which were adjusted to the present research, these are shown below (Table 7).

Table 7. - Frequency distribution of the evaluation of didactic indicators in the pretest

Indicator I			Indicator II			Indicator III			Indicator IV			Comprehensive Evaluation		
Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
5	1	4	1	5	4	7	1	2	1	4	5	1	6	3
fifty%	10%	40%	10%	fifty%	40%	70%	10%	twenty%	10%	40%	fifty%	10 %	60%	30 %

The integrative nature of the proposal enables unity between teachers and families in the execution of the activities of the *Educa a tu Hijo Program* in children from three to four years old, which reveals the need for both parties to be trained to execute the games, starting of collective construction and critical opinion workshops. Which coincides with Rabilero *et al.* (2018).

It is vitally important that during the performance of psychomotor games the development of motor skills is integrated, which is of relevance where children can express their opinions and desires. In this way, the emotional is articulated with the motor, a fundamental element for the cognitive development of the child. The criteria of Guzmán (2019) are assumed.

Psychomotor games contribute to the comprehensive development of the child, his/her development in society, his/her encounter with his/her own body, his/her memory, hisher language, writing and his/her relationship with other children in his environment are strengthened. This enables their training as a human being influenced by the motivation to practice physical activities, which improves their basic motor skills Bernate (2021).

Therefore, it can be concluded that psychomotor games play an important role in the motor development of children from 3 to 4 years old in the *Educa a tu Hijo Program*, where the integration of teachers and family members constitutes the primary role for motivation and stimulation through appropriate actions for the stage, which will have a significant impact for their entire life

Most of the children who were evaluated in psychomotor development in the area of motor skills did not present delays, only 2 children ended up evaluated as normal where they were more significantly affected in motor skills in male children as opposed to girls.

Hence, the game is conceived as the space where different ways of generating enjoyment and pleasure are involved in the psychomotor development of children and that serves as a tool in the pedagogical process of the teacher, the family and society where the child It is capable of expressing feelings, wills and desires.

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The authors declare not to have any interest conflicts.

***Authors' contribution*:**

The authors have participated in the writing of the work and analysis of the documents