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Effects of an Educational Psychomotor Intervention program in preschool children

Efectos de un programa de Psicomotricidad Educativa en niños en edad preescolar

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Abstract

This research was intended to investigate (test) the effects of an Educational Psychomotor Therapy in children physical and peers relation self-perceived competence in pre-school, and analyze through the educator perception the relevance to include the Psychomotor Therapy in Preschool curriculum. The sample (*N*=9) consisted of 4 male and 5 female, between 48 and 72 months of age (*M*= 61.6; *SD*= 9.53), with normative neurodevelopment and belonging to the same preschool. An Educational Psychomotor Intervention program was created and conducted for 2 months, with one week session during 60 min. each, and applied to the group of children at the same time. Data analysis was performed with descriptive analysis and non-parametric statistics, using the *Wilcoxon* statistical test. The results from the data comparison in pre and post-intervention evaluation showed significant gains in physical self-perceived competence and non-significant gains in relation with peers' self-perceived competence. The Kindergarten Teacher refers significant positive differences in children motor development and in learning motivation in classroom tasks. She sustained also the inclusion of Educational Psychomotor Intervention in preschool curriculum. In conclusion, this research provides interesting results that contribute to increase understanding about Educational Psychomotor therapy relevance in psychosocial and academic preschool child development, and warns to further research in this area.

Keywords

Psychomotor therapy; self-perceived competence; children; learning; preschool.

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Resumen

Con esta investigación se pretendió evaluar los efectos de Psicomotricidad Educativa sobre la competencia física percibida y la percepción de competencia de la relación con compañeros en los niños de preescolar. Se pretendió también analizar a través de la percepción de educador la pertinencia de incluir la Psicomotricidad Educativa en el currículo preescolar. La muestra (*N*=9) estuvo compuesta por 4 varones y 5 hembras, entre 48 y 72 meses de edad (*M* = 61,6; *DE* = 9,53), con el desarrollo neurológico normativa y que pertenece a la misma preescolar. Un programa de Psicomotricidad Educativa se llevó a cabo durante 2 meses, con una sesión por semana aplicada al grupo de niños al mismo tiempo. Se realizaron análisis descriptivos y la estadística no paramétrica, utilizando la prueba estadística *Wilcoxon*. Los resultados de la comparación de los datos en la evaluación antes y después de la intervención mostraron un aumento significativo de la competencia física percibida y un aumento no significativo en la percepción de competencia de la relación con sus compañeros. El educador se dio cuenta de las diferencias positivas significativas en los niños en el desarrollo motor e en motivación para aprender en las tareas del aula. El educador también defendió la inclusión de la Psicomotricidad Educativa en plan de estudios preescolar. En conclusión, esta investigación proporciona resultados interesantes que contribuyen a aumentar la comprensión sobre la relevancia de la Psicomotricidad Educativa en el desarrollo psicosocial y académico del niño preescolar, y advierte de una mayor investigación en esta área.

Palabras clave

Psicomotricidad; competencia percibida**;** niño; aprendizaje; preescolar.

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Introduction

Educational Psychomotor Intervention is one of the areas from Psychomotor Intervention that take part in educational context inside school (Ferronatto, 2006). This is directed to children with normative development, with ages between 0 and 8 years old (Vecchiato, 2003) and intends to help them to discover their own capacity for action and to develop their motor, personal and social skills to adapt to the several requests of the preschool world (Rodríguez & Giráldez, 2016). Educational play situations are pre-organized by therapist and implemented in a small-group (Cró & Andreucci, 2014). Children recognize this therapeutic moment as a time to know and deal better with their body image; to learn how communicate and express their ideas and anxieties about school in different ways; and to develop interpersonal competences, such as respect and cooperation with peers (Aquino, Browne, Dantas, & Sales, 2012).

Children cognitive skills between 4 and 7 years old allow them to feel a difference in the relation with peers in many different areas. Motor and social areas are two of them. This leads the children to compare them self with peers and construct more realistic outlooks about them self-competence. This fact can bring good or bad consequences to emotional, social and educational life in the child future, depending in which way children perceive their self-competence (Harter, 2012). Children with a high self-perceived competence are more capable to reach their personal goals; to use better their personal strategies; to have more self-regulation and strength in difficulties of life; and to be more capable to develop intern motivation and mental health in general (Mantzicopoulos, French, & Maller, 2004). On the other hand, children with a low self-perceived competence run the risk of developing anxiety symptoms, depression, and being excluded by peers (Coplan, Findlay, & Nelson, 2004; Nelson et al., 2009).

Fonseca, Garrote, Todoli and Zenarruzabeitia (2014) argues that in the first years of life is important for children to move, to interact with other children, to manipulate objects and explore space. Costa, Furelos, Gomez and Giráldez (2015) and Teixeira, Gomez, Giráldez, Couto and Furelos (2015) concluded in their study, that structured physical education lessons have impact on children's psychomotor development and in interaction with the world outside. According to Evans and Roberts (1987), children more proficient in

physical activities, have more social success and popularity among peers than children with low physical competence. So, it seems to be really important to create many different opportunities in childhood so that children can feel more physical competent (Brewer, 2011).

Meyer and Damásio (2009) argue that proper development of social and emotional competences ally to a normal cognitive development can be the key to a personal and academic development success in adulthood. Aquino et al. (2012) and Rodríguez & Giráldez (2016) sustains that Educational Psychomotor intervention helps the personal, motor, social and academic learning competences. Costa et al. (2015) and Teixeira et al. (2015) advocate also that motor experiences are an essential condition for adaptation in a child's didactic learning. In this sense Hardy, Reinten-Reynolds, Espinel, Zask and Okely (2012) warn for the major importance to consider Educational Psychomotor practices in preschool curriculum.

In the Mostafavi, Ziaee, Akbari and Haji-Hosseini (2013) Iranian study was applied an Educational Psychomotor program to children aged between 4 and 6 years old with normative neurodevelopment. The program was applied for 8 weeks, three times a week, and after it, children showed positive and significant gains in academic performance. In Agrelos (2013) Portuguese research, where was applied an Educational Psychomotor program during 8 weeks, once a week, to same age children, with normative neurodevelopment *(N=8)*, also found significant improvements in the ability to learn.

Scientifical studies proving positive influence of Educational Psychomotor Intervention in personal, social and academic development of preschool children are scarce. This affects the recognition and validation of this intervention, as a specific discipline, in the educational context (Rodríguez & Giráldez &, 2016) and undermines a better care to preschool children. Thereby the first objective of this study is to evaluate the effects of an Educational Psychomotor Intervention in physical self- perceived competence; the second objective is to evaluate the effects of an Educational Psychomotor Intervention in children peers relation self-perceived competence; the third objective is, through the kindergarten teacher perception, analyse the obtained results by children; the fourth and last goal is to understand in what extent could be relevant the inclusion of an Educational Psychomotor Intervention as a preschool curriculum area in kindergarten teacher's perception. The correspondent hypothesis were to verify (1) the existence of positive and significant differences in children physical self-perceived competence after the psychomotor program;

(2) the existence of positive and significant differences in peers relation self-perceived competence after program application; (3) the kindergarten Teacher will identify changes in children motivation to learn, motor and social skills after the psychomotor program; (4) the Kindergarten Teacher will consider pertinent to include Educational Psychomotor Therapy in preschool curriculum.

Methodology and Tools

Study design

This research was conducted according to the experimental methodology. It used a within-subjects design and compared the results obtained by the same group of children at two different time points, before (pre-intervention evaluation) and after (post-intervention evaluation) the psychomotor educational program application.

Sample

Nine Portuguese preschool children (four male and five female), with a mean age of 61.6 months (*min.* =40; *Max.* = 75; *DP*= 9.53), participated in this study. The children were selected from one preschool in Leiria (Portugal city) based on existing classes. None of the children were diagnosed with developmental delays or received any special educational support. Five children practiced physical activities out of the preschool, as gymnastic and swimming.

The kindergarten Teacher was a 35 years old female, and post graduated in Education, with 10 years of work experience as a preschool Kindergarten Teacher. She did not present any qualification regarding special education area and had no knowledge about Educational Psychomotor Intervention before the program.

Procedure

Before the start of this research was necessary to submit to the ethics committee of the University Fernando Pessoa, which approved its realization.

Initial contact was made with one preschool establishment by a presentation letter explaining the research project and requesting an interview to explain the objectives of the study. After that, an authorization to apply the intervention program was requested to the Technical and Pedagogical Principal of the preschool establishment. Then, the process of pre-selection the sample was made through an intentional sampling method.

After this, legal guardians of the pre-selected children were informed about all research conditions and were asked to give consent to their child's participation in the study. They were also informed that all the collected information during the study was anonymous and confidential, and also, that they could give up of the study any time with no consequences. The consent of the Kindergarten Teacher to take part in this study was performed in the same way. In a playful way, all pre-selected sample children were informed as well about the purpose of the study and were told that their participation was voluntary, that they could quit wherever they want. Their verbal consent was also necessary so they can participate in this study.

All the ethical principles were taken into account; it had been assured anonymity and confidentiality of the participants in all documents filled with a code number association to each participant's documents. Only the investigator had access to the gathered information.

Initial sample number was 11 (*N*=11), but then was reduced to nine (N=9), because just nine children corresponds to all required criteria.

Each child of final sample was individually submitted to a pre-intervention evaluation with the Portuguese version of *Pictorical Scale of Perceived Competence and Social Acceptance for Young Children* (Ducharne, 2004), conducted in a room provided by the preschool establishment and lasted 20 min..

The Psychomotor Educational Program was created by the investigator based in other existing Programs in literature, which had similar age and neurodevelopment characteristics of the present study sample children and reported psychomotor benefits in their sample (Cró & Andreucci, 2014; Kreichauf et al., 2012; Logan, Robinson, Wilson, & Lucas, 2011; Mostafavi et al., 2013; Teixeira et al., 2015; Vecchiato, 2003).

The program lasted two months, with one week session (8 sessions in totally), during 60 min. each one, and applied to all children at the same time, in group, in the preschool gym.

The structure of the sessions followed a model that consisted in three fundamental phases: initial activities (to welcome children and turns therapeutic space more familiar to them); fundamental activities (structured activities to work on fundamental motor skills, and non-structured activities directed to self-knowledge and ability to explore, create and communicate in group); and in the session last part, the final activities (relaxation and painting activities that allowed returns to calm and an individual reflection about all session's experience).

After the program conclusion, the children's sample was submitted to a post-intervention evaluation, with the same pre-intervention evaluation instruments, and was given to the kindergarten Teacher, the *Kindergarten Teacher's evaluation questionnaire*.

Instruments

Sociodemographic questionnaire for characterization of children was elaborated by the investigator and was used to collect data from legal guardians of the participating children. It was used to collected six types of information: children legal guardian identity (*e.g.*,'age', 'kinship degree'); personal data of the child (*e.g.*, 'sex', 'birth date', 'nationality'); data of the child's family (*e.g.*, 'household'; 'marital status of parents'; 'socio-economic family background'); social data of the child (*e.g.*, 'whether to participate or not in physical activities outside of the preschool', 'the importance level that children legal guardian attributes to physical education practice'); to know if the child received or not therapeutic support outside the preschool.

Harter and Pike (1984) *Pictorical Scale of Perceived Competence and Social Acceptance for Young Children*, adapted into Portuguese by Ducharne (2004), was used to measure the physical and peers relation self-perceived competence. The *preschool – kindergarten scale version* has four separate subscales: cognitive competence, physical competence, peer acceptance and maternal acceptance. For this study it was only used the physical competence items ('good at build puzzles', 'good to ride a swing'; 'good at climbing', 'good at jumping', 'good at running' ,'good to jump to foot- one leg', 'good playing ball, 'be strong') and peer acceptance items ('has friends', 'has friends to play with', , 'gets asked to play with others', 'friends lend toys', 'friends sit beside him'). The scale was,

individually, used during 15 min. and the tasks are assisted by pictures to facilitate the comprehension of the question. There are two books of preschool –kindergarten plates, one for boys and other for girls. Each item is scored on a four-point scale, where a score of 4 would be the most competent or accepted, and score of 1 would designate the least competent or accepted. Item scores are averaged across the six items for a given subscale. The final value of each subscale corresponds to the child's competency profile evaluated in it and each of them are analyzed in a table, where is possible to understand if the child's profile is below or above of what would be expected for their chronological age. This scale has been widely used and validated in different samples, showing excellent psychometric properties. The internal consistency of a Portuguese adapted scale is considered in a global level (Cronbach's alpha= .87) and in each of the used subscales (Cronbach's alpha for physical competence=.70); (Cronbach's alpha for peers acceptance= .82), which proved to be satisfactory and indicative of homogeneity among the items (Ducharne, 2004).

Kindergarten Teacher's evaluation questionnaire, was developed to this study by the investigator with closed and open questions, collecting four types of information: kindergarten teacher's sociodemographic data (*e.g.*, 'sex', 'age', 'academic habilitations', 'experience service'); kindergarten teacher's knowledge about Educational Psychomotor Intervention in preschool; kindergarten Teacher's perception about the existing or not of earnings in personal, social and academic development of children after psychomotor program application; Kindergarten Teacher's opinion about the relevance of include Educational Psychomotor Intervention in preschool curriculum.

Data analysis

The data were analyzed using statistical package IBM-SPSS- program Statistical Package for Social Sciences, version 22.0 Windows. To analyze the *Sociodemographic questionnaire* and *Kindergarten Teacher questionnaire* variables, it was only used a descriptive analysis (mean, standard deviation, skewness and kurtosis). To detect the differences of the results between the pre-and post-intervention of the participating children in physical and peers relation self-perceived competence and due to the small sample size (N<30), it was used nonparametric statistics, using the *Wilcoxon* statistical test.

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Results

After intervention program, significant results in physical self-perceived competence (*Mdn*= 25.00; *T*=-2.38; *p*=.02), and non-significant results (*Mdn*= 18.00); *T*=-.357; *p*=.72) in relation with peers self-perception competence (*Mdn*= 18.00); *T*=-.357; *p*=.72) were found.

It is possible to verify the differences in each child after the Educational Psychomotor Intervention Program, in physical and peers relation self-perceived competence.

Table 1. Evolution of each participating children in the physical and peers relation self-perceived competence after the application of Educational Psychomotor intervention program.

Participating children's code	Physical self-perceived competence	Relation with peers self-perceived competence
1	=	+
2	=	-
3	+	+
4	+	-
5	+	+
6	+	-
7	+	+
8	+	-
9	+	+

Subtitle: (+) Evolved; (=) Kept; (-) Regressed.

- 4 of 9 children (3, 5, 7, 9) evolved in physical and peers relation self-perceived competence;

- 2 of 9 children (4, 8) evolved in physical self-perceived competence, and regressed in peers' relation self-perceived competence;

- 1 of 9 children (1) held the values of physical self-perceived competence, but evolved in peers' relation self-perceived competence.

- 1 of 9 children (2) held physical self-perceived competence, but regressed in peers' relation self-perceived competence.

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The kindergarten Teacher refers significant positive differences in children in global motor skills and an increase interest and motivation in classroom tasks by the children. In this way, the kindergarten Teacher considers very relevant the inclusion of Educational Psychomotor Therapy in preschool educational curriculum. The kindergarten Teacher justifies her opinion by saying that Educational Psychomotor intervention allows a multidisciplinary approach which focuses on important aspects of child development such as: reflectivity, creativity, capacity to solve problems; learn how to work in team; collaboration, respect, comprehension, communication with others; difficulties resistance; effort and involvement in school tasks. She also said that Psychomotor Intervention is an activity so integrative and complete that allows working a lot of areas that are usually forgotten in the traditional areas of the curriculum and the Knowledge applied in Educational Psychomotricity is sometimes a weakness in the training process of Kindergarten Teachers, who often do not feel confident to work in these areas.

Discussion and Conclusions

One of the main goals of this study was to analyse the possible positive Educational Psychomotor Intervention influences in children physical and peers relation self-perceived competence. Despite the small sample size in this study, the results partially confirm the initial hypothesis; insofar it was shown positive and significant difference in children physical self-perceived competence after the Educational Psychomotor Program. The results of the present study match Costa et al. (2015) and Teixeira et al. (2015) conclusions which argue that structured physical education activities have a large impact work on motor skills development, and with Jambunathan (2012), Valentini and Rudisill (2004) conclusions which argue that intervention programs that value free activities, enhance children's autonomy and value their quality performances, translating into improvements in physical perception competence. Otherwise, results may also have been influenced by the realization of paintings about some session's activities, or by the relaxation activities that occurred in last part of the sessions, which may have contributed to promote children further reflection on motor experience, and in this sense, the development of a better body self-conscience and more realistic motor self-perceived competence.

On the other hand, the second goal of this research was to evaluate the effects of Educational Psychomotor intervention in peers' relation self-perceived competence. With regard to the initial hypothesis, the results show non-significant positive differences in peers relation self-perceived competence after the program. According to Harter (2012), these results could be linked to the fact that the social self-perceived competence realistic construction just occurs between 4 and 7 years old and, at this age, the realistic perception could not match anymore with the peers' relation self-perceived competence. As Rodríguez and Giráldez (2016) said, Educational Psychomotor intervention helps the personal learning competences, and as Cró and Andreucci (2014) said, a more realistic physical self-perceived competence indicates a better knowledge of physical and psychological potentialities and limitations of the body, what may have happened during the program application and may have influenced the low significance of the results obtained in this variable.

Moreover, the perception skills about the relationships with others are a representation system not so dependent on practical tasks, but more related with the relation opportunities that are given in time and space, and with the child cognitive development (Harter, 2012). Besides, it was not possible to carried out this Educational Psychomotor program application with the frequency considered appropriated by Mostafavi et al. (2013) and by Rodríguez and Giráldez (2016) (*e.g.*, often three sessions in a week, to produce more effective results), which may influenced the non-significant results in this variable.

Related to the third goal, at the end of the Educational Psychomotor program, the Kindergarten Teacher mentioned that she has found positive and relevant differences in children motor skills and in the motivation with academic activities after the program. These results go along with Agrelos (2013), Aquino et al. (2012), Costa et al. (2015) and Teixeira et al. (2015) research, which noted that when preschool children participate in a psychomotor program, they have academic progressions. As well, Mostafavi et al. (2013) study states that programs that encourage motor education and group free-play, as Educational Psychomotor programs, when are applied to preschool children, between 4 and 6 years old, have favorable effects on school performance.

Several studies have reported the importance of including educators in psychomotor intervention programs, enhancing the significance of them having some psychomotor development knowledge. In a way, they will be more able to recognize mental and corporal difficulties that compromise child learning capacity, and also contributing to promote a better education and healthy child global development (Agrelos, 2013; Oliveira & Sousa, 2013; Teixeira et al., 2015).

Finally, concerning the last goal, at the end of the program, the last hypothesis was confirmed. Kindergarten Teacher statement reinforces the importance of including Educational Psychomotor Intervention sessions in preschool curriculum. This opinion is in concordance with Fonseca et al. (2014), and Hardy et al. (2012) researches, who argues that psychomotor practices should be considered an integral part of the preschool curriculum with shared goals with the curricular goals.

This research provides interesting results that contribute to increase understanding about Educational Psychomotor therapy relevance in psychosocial and academic preschool child development, and to the preschools curriculum restructure. The use of an assessment tool translated and standardized for the Portuguese population (which increases results validity), and the construction of an original Educational Psychomotor intervention program (based on literature review related to the study variables), may have contributed to achieve more effective results.

Limitations of the study and proposals for improvement

This study has some limitations such as: to be a transversal and comparative study and to have one small sample size in which participants had similar socio-economical characteristics. Future studies should use a larger and significant children and Kindergarten Teachers sample, in more than one preschool, from different socio-economical contexts, for more realistic and generalized results. Future studies could also compare short and long term psychomotor intervention programs, and check if the program duration could be associated

with more effective results in terms of self-perceived competence. Similarly, longitudinal studies in this area should be realized in order to understand the differences between children who participate in psychomotor program and children who did not participate in this kind of programs and the consequences in their adolescent/ teenage life. It should be analyzed the influence of Educational Psychomotor programs in participating children, later, in their adulthood. Because of limited time reasons to implement this research, it was not possible to include a *follow-up* moment, which is advised to happen in future studies, in order to enrich the results, ensure more consistency and validity, and to give a real awareness of the influence of mediating variables (*e.g.*, participation of children in other physical activities out of preschool). Continuing to develop more research within Educational Psychomotor preschool intervention is really important, in sense to this health therapy recognition and implementation in preschools, but also to prepare Kindergarten Teachers for understand and work the body language, in order to provide academic childhood success and prevent some learning difficulties caused by psychomotor childhood problems.

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