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PHYSICAL EDUCATION IN EARLY CHILDHOOD EDUCATION AND CARE ~ RESEARCHES ~ ~ BEST PRACTICES ~ ~ SITUATION ~



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Physical Education in Early Childhood Education and Care: Researches – Best Practices – Situation

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The Psychomotor Domain in Development by Intervention Program: a Mexican Experience

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Abstract

The purpose of this study it was to evaluate the influence of structured physical education on the psychomotor development of 3 to 5 year-old preschool children. The sample consisted of 350 students of both sexes (3 to 5 year-old) from 9 public kindergarten classes in México. A battery of psychomotor tests (pre-test) was used to assess the students' psychomotor development profiles, whit the Harrow model. The sample was divided in 2 groups: an experimental group (n=175) and a control group (n=175). Physical Education (PE) teachers used a structured 24-week PE plan in the experimental group. Pre and Post tests were performed on both groups. The results were compared in their psychomotor profiles. An increase in psychomotor domain was statistically significant in the experimental group (at all ages and in all variables analysed $p < 0.001$) There were no significant differences in gender ($p > 0.05$). Structured physical education is important for preschool children's psychomotor development. Physical activity impact on children's interaction with the outside world was proved, through their overall development motivated by the structured physical education lessons.

Key words: Physical education, Psychomotor Development, Motor behaviour

Introduction

The early psychomotor stimulation is critical for childhood development (Timmons, Naylor & Pfeiffer, 2007; Trudeau & Shephard, 2008). It is through motor exploration that children's self-awareness and awareness of the body domain and the perception of their environment. The progressive acquisition of skills concerning both mental and motor activities is defined as psychomotor development. Motor experiences are a vital condition for adaptation in a child's didactic learning; and can stimulate thinking. Additionally, a poor field of operation can delay and limit an individual's perceptive abilities (Thompson, 1996).

Authors like Lubans, Morgan, Cliff, Barnett and Okely (2010) and Cools, Martelaer, Samaey & Andries (2009), had postulated that the stimulation and movement are crucial in early childhood, given that they promote the development of the physical, cognitive and social skills. Movement is in the heart of children's active lives, as they acquire their autonomy in different daily life situations.

In the early age, from 3 to 5 years, preschool children acquire a set of motor skills that enable gradual control of the body. Some of the skills that children need to grow and develop are acquired through natural movement at this age. This period is important for the development of essential movement skills in adult period (Gallahue & Donnelly, 2003).

Kindergarten Schools provide the ideal environment for the early psychomotor activities. Nevertheless, those responsible for their education (i.e., parents, teachers, and educators) must create appropriate learning opportunities (Venetsanou & Kambas, 2010). Being so, it is highly recommended to create opportunities for children to experience different motor practices in suitable places, equipped with specialised materials and prepared to apply specific educational activities.

Despite its importance, there is scanty information in Mexico on this issue. Based on these facts, the purpose of this study it was to investigate the influence of structured Physical Education plan on the psychomotor development of 3 to 5 year-old preschools students.

Methods

Participated 350 kindergartens students with ages between 3 to 5 years old. The project was approved by the ethics committee of the Decanate of Health Sciences in the University of Football and Sports doctoral program. All students underwent a set of psychomotor tests (pre-testing). The sample was then randomly divided in 2 groups: 175 children integrated the control group (CG), and 175 children for the experimental group (EG). These students were 3 to 6 years old to. These students belonged to nine pre scholar education (Kinder garden) from the León, Municipality. The Municipality Council of the Sports Municipality also approved the research project, and besides this authorisation, the project was explained to parents, who authorised the children to participate and signing a voluntary information consent paper. During 24 weeks, the EG students underwent a structured PE plan. At the end of intervention, both groups (CG and EG) repeated the psychomotor tests (post-testing. After completing the pre-testing, the students were divided in 2 groups: a control group (CG, 150 students, 75 males and 75 females) and

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experimental group (GE, 150 students, 50% males: 50% girls). The battery of psychomotor tests evaluated 5 psychomotor skills: coordination and balance (CB); body scheme (BS); laterality (L), spatial organisation (SO); and temporal organisation (TO). The EG students participated in PE regular lessons twice a week, of 45 minutes long (each). The classes started in January and ended in June (6 months), comprising 48 PE class sessions. Based on the psychomotor principles, the classes were designed to promote activities that would enhance the children's overall development and body awareness. Each lesson was planned according to different class sections: warm-up, principal major and cool-down activities. The warmup focused on activation and physiological preparation for physical activity. In each session, the principal sections focused on specific activities based on several psychomotor principles, including adequate motor coordination, overall coordination, spatial structure, temporal organisation, body structure, body image, body knowledge, and laterality. Results of pre and post-test measurements, were normalized by a percentile distribution, according with intra group data. The operation of program performed most activities using circuits. Circuits are suitable for children given they consist on multiple exercises that require reduced time to accomplish. During each cool-down section, we always tried to relax the children with stretching and relaxation exercises. The CG had also moments of physical activity in the school according with the national plan of physical activity (weekly or biweekly); however, this physical activity was not structured and adapted to the group. At the end of 24-week intervention, the children underwent post-testing. The CG and EG underwent the same psychomotor evaluations that they performed during the pre-testing. Two way analysis of variance were carried out to compare the effects of programs in both groups and by sex. In all cases the level of statistical significance was fixed an alpha of 95%.



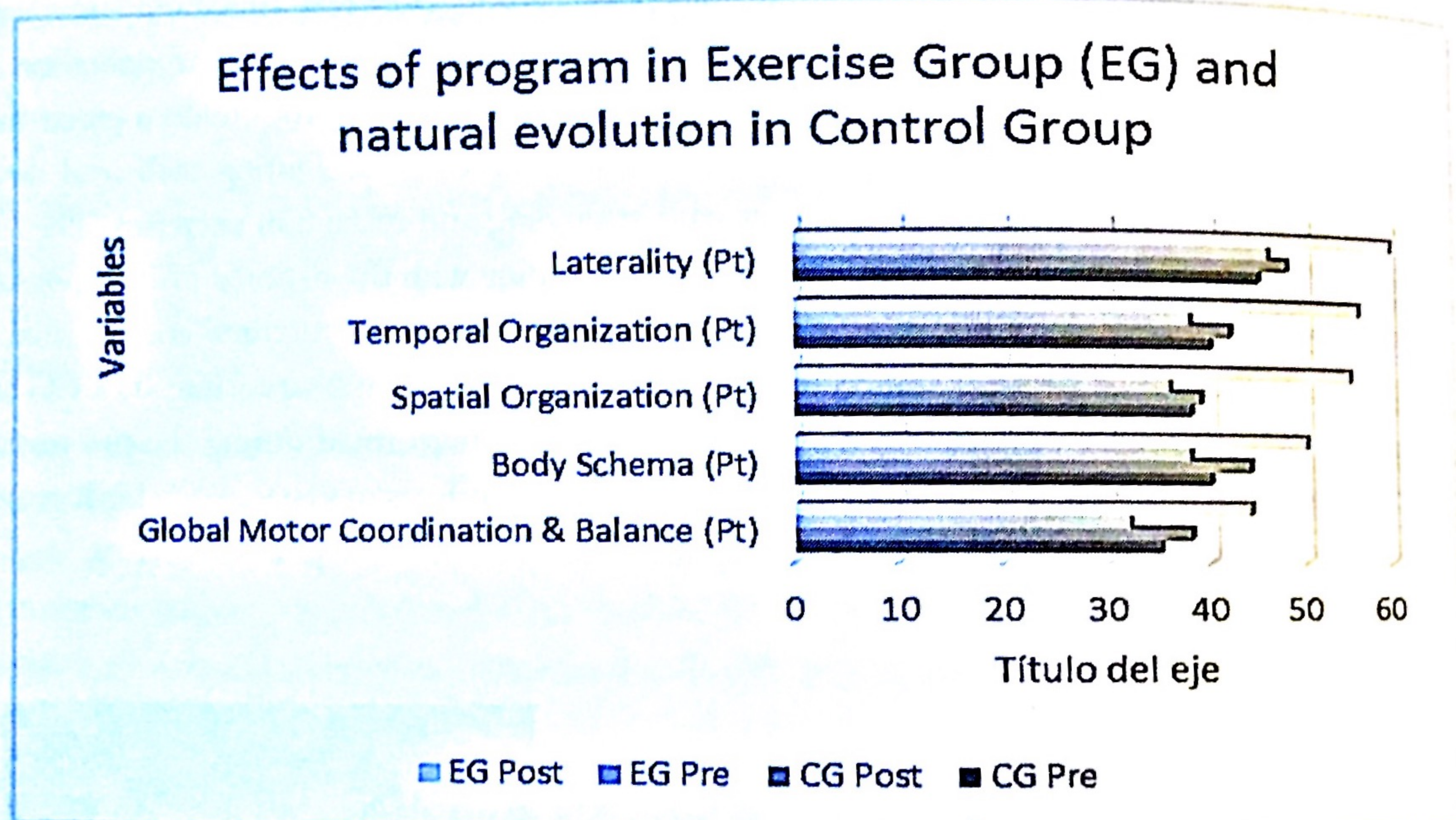
Photo1 Promotional Poster Photo

2 Manoeuvres of intervention, walk lateral movements

Results

The scores of the experimental group are higher than those of the control group in all variables. At pre-test, the variables of coordination and balance (4 years), body schema (3, 4 and 5 years), spatial organization (3, 4 and 5 years) and temporal organization (4 and 5 years), had higher scores in the control group compared to those obtained in the experimental group. However, in the

post-test, the experimental group had higher scores than the control group, after the implementation of the physical education specific program. There were no significant differences found in the inter-subject, related to the gender factor, in any of the variables analysed, $p > 0.05$. Inter-subject factor group (CG vs. GE) intra-subject factor and test (pre-test vs. post-test) When analysing the inter-subject factor group individually, significant differences were found in terms of coordination and balance ($p < 0.001$) and laterality ($p = 0.001$). The interaction between the two factors, we can find significant differences in all the variables analysed ($p < 0.001$). After the application of the physical education specific program, the scores increased in the experimental group (post-test) compared with the pre-test scores. The experimental group, when comparing the pre-test with the post-test, shows significant differences at all ages and all variables, always with a $p < 0.001$.



Picture 1 Results of Pre and Post evaluation
(Porcentilar distribution combined groups by sex and age). Barrs reepresents mean values

Table 1 Results of Control Group (CG) nad Experimental Group (EG) in Pre and Post Experimental Conditions

Variable	CG Pre	CG Post	EG Pre	EG Post
Global Motor Coordination & Balance (Pt)	35 ± 2	38 ± 1	32 ± 1	44 ± 2
Body Schema (Pt)	40 ± 2	44 ± 2	38 ±	50 ± 3
Spatial Organization (Pt)	38 ± 2	39 ± 2	36 ± 2	55 ± 3
Temporal Organization (Pt)	40 ± 1	42 ± 3	38 ± 2	56 ± 2
Laterality (Pt)	45 ± 1	48 ± 2	46 ± 2	60 ± 3

Table 1. Results of Control Group (CG) and Experimental Group (EG) in Pre and Post Experimental Conditions
Values are percentile distribution Mean and Standard Error of Mean and represents the combination of groups by age and sex

Discussion

This study clearly that physical activity decrease is an important factor in the obesity rates increase (Pate et al., 2006). According to several studies, physical activity levels are minimal at an early age levels in preschool-aged children (Stodden et al., 2008; Tucker, 2008). Children who do not receive adequate motor skill instructions and practice may show a development delay in their abilities (Stagnitti et al. 2011; Goodway & Branta, 2003). Hence, it is essential to deconstruct the commonly accepted idea, sometimes supported by academics, that children are spontaneously active. Unfortunately, the number of children not participating in adequate physical activity is still a global concern (Guthold et al., 2010; Cohen, 2014). Also, studies conducted by Favazza et al. (2013), Bundy et al. (2011) and Palma (2008) show that, simple interventions in a young age with children engaged in spontaneous play could be directed so as to increase their physical activity and social skills. Thus, implementing PE activities, preferentially in the form of structured PE classes, at an early age (i.e., preschool/kindergarten) helps initiate physical activity in children and increases their motor (Stodden et al., 2008) and cognitive development (Trudeau & Shephard, 2008). The study results show that the EG score variations were greater (and by greater we mean statistically significant) for all abilities compared with the CG score variations. These results, as in other studies (Robinson, 2011; Valentini & Rudisill, 2004; Goodway, Valentini & Rudisill, 2002), demonstrate the positive influence of structured PE's on the psychomotor development of preschool children.

PE or other physical activity objectives involve the harmonious work of body and mind, a balance between what the body expresses and what the mind thinks. Unfortunately, the role of PE and PE teachers in public preschool education is not well defined. Besides this fact, PE is not always taught in a proper manner. Sometimes PE is taught in a general manner, without the necessary involvement and without paying enough attention to each student's individuality.

The role of the preschool education is fundamental for the child development process. At this stage, quality teaching practices should stimulate children, considering their individual characteristics and needs, to help them acquire during development several essential abilities and skills. In this sense, studies have highlighted the importance of PE and PE teachers in the child development. By analysing the study outcome, we argue that structured PE is important for preschool children's psychomotor development because it increases their overall development.

Conclusions

The results of this study shows:

1. Structured physical education is important for preschool children's psychomotor development.
2. Physical activity impact on children's interaction with the outside world was proved, through their overall development motivated by the structured physical education lessons.

3. Simple interventions in a young age with children engaged in spontaneous play could be directed so as to increase their physical activity and social skills.

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Best Practices