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Introduction

Preschool years are a period that forms the basis of all areas of the development of human life. The type and quality of the experiences provided to the child in this period largely depend on the variety of the opportunities that the adult can give him (Oktay, 2007). Many of the developed countries have increased their pre-school education rate to over 90%, as it is accepted that the quality education offered to children from early ages contributes to the development level of children and the maturity of starting basic training. There are many educational models, approaches, and program suggestions on how to support children in which areas of development. These suggestions can be a training program that includes sustaining a single development area or a model that contributes to whole development of children.

In this research, education programs applied to support the psychomotor development areas of children are discussed. Psychomotor development, which develops in parallel with physical development, means that the individual (child's) limbs such as arms and legs become coordinated with all of the organs, the movements are taken under control and can be done skilfully (Yeşilyaprak, 2006). Psychomotor development; It includes changes that occur due to growth and maturation in the human body. Alterations in motor skills, brain, and motor coordination, and some hormonal changes are examined in the field of psychomotor development. Psychomotor development is closely related to the growth in the neuro-muscular systems. Competitive movements, mainly controlled during infancy, are considered as indicators of the development of babies. Many studies are carried out on how to support children's psychomotor development.

Scientific studies carried out by academics or postgraduate students play a crucial role in the development of society. Experimental studies in the field of education, as well as in many areas of science are essential in terms of increasing the quality of education. As a result of scientific studies, scientists all over the world publish thousands of articles, theses, papers, and books every day. As the number of scientific studies increases, the need for comprehensive and systematic research synthesis increases. One of the most effective methods for synthesizing individual studies is meta-analysis. Meta-analysis means combining the numerical results of researches whose ways and results are different, even contradicting each other. Meta-analysis allows researchers to achieve more clear results than any of the studies they included in the analysis (Hunt, 1997). Borenstein, Hedges, Higgins, and Rothstein (2013) defined "Meta-analysis as statistical synthesis of results in the study series."

When pre-school literature is examined, individual studies involving educational interventions supporting children's developmental areas are encountered. However, there is no meta-analysis study aiming at revealing the impact of these intervention programs on children's development. It is thought that a meta-analysis study conducted to show what extent experimental interventions with different study groups affect the development of children is important in terms of seeing the general picture. For
this reason, postgraduate theses published between 1998-2020, which are stated to support psychomotor development, were examined in terms of their purpose, method, and results. Within the scope of the research, it is aimed to reveal the effects of interventions applied to pre-school children on the development of pre-school children in the psychomotor field in postgraduate theses. For this purpose, answers to the following questions were sought:

1. What are the education programs applied to pre-school children?
2. What is the effect of education programs implemented to pre-school children on children's psychomotor development?

**Method**

The model of this research is a meta-analysis, one of the systematic methods of synthesis. Meta-analysis is the synthesis and interpretation of the findings obtained from independent individual studies using various statistical techniques. The purpose of the meta-analysis is to reach the most quantitatively correct one by combining the results and increasing the sample size obtained from studies on the same subject at different places and time to reveal the facts (Cumming, 2012).

The research sample consists of 28 postgraduate theses published in Turkey, between 1998–2020 (the scan was terminated on 15/03/2020), including educational interventions to support the development of children's psychomotor domain of preschoolers. Of these theses designed in experimental design, 19 are master's, and 9 are doctoral theses.

The criteria used in the selection of the studies included in the research are presented below.


Criterion 2: Experimentally conducted master and doctoral theses containing educational interventions implemented to support the psychomotor development of pre-school children with healthy growth in Turkey.

Criterion 3: Descriptive statistical data of the studies included in the study are needed to calculate the effect sizes required for the meta-analysis study. Therefore, studies, including sample size, arithmetic mean, and standard deviation values were included in the study.

The first screening for the research was carried out in June 2019 and the second in March 2020, using various keywords through the national thesis center. Comprehensive Meta-Analysis V3.0 (CMA) software trial copy was used to analyze the data obtained from the studies included in the research. Appropriate statistical analysis was performed in the light of data such as arithmetic mean, standard deviation, and sample sizes. Since the significance level of the studies included in the scope of the survey was taken as 0.05, the significance level of the statistical analysis was determined as 0.05 in this study.

**Findings**

Publication bias of the studies included in the study was evaluated using the funnel scatter plot, and no publication bias was found. Cochrane's Q statistics and I² index were used to determine the heterogeneity between studies. It has been interpreted that when I² statistics is below 25%, it is low when it is between 25-50%, and when it is above 50%, it is high heterogeneity (Patsopoulos, Evangelo, and Ioannidis, 2008).

In the heterogeneity evaluation of the model, I² value was found as 83.83, and it was determined that there was heterogeneity between the studies. In addition, the model was observed to be heterogeneous according to the Q test (Q: 166.98, p <0.001). According to the random-effects model, the data in 28 studies included in the meta-analysis were calculated to be significant in favor of the experimental group in which educational intervention was performed with an effect size value of ES = 0.671, with the upper limit of 0.914 and the lower limit of 0.402.

**Discussion, Conclusion, and Recommendations**

In Turkey, between the years 1998-2020, the number of interventions in support of the thesis for psychomotor development is less than the number of thesis for other development areas. However,
there has been an increase in the number of thesis studies involving intervention in the psychomotor field in the last decade. When examining these studies, many descriptive, relational, or experimental studies are applied infusion classes or with children with special needs, as well as studies conducted with parents, teachers, prospective teachers and administrators prepared according to qualitative and quantitative paradigms. Studies conducted with different methods and groups are excluded from this research. In this study, the effect of educational intervention programs applied to pre-school children on the development of children in psychomotor fields is emphasized.

The number of samples belonging to 28 studies included in the study is 1575, 792 of which are experiment and 783 of which are control. It is seen that most of the theses examined within the scope of the research are master's theses applied in independent public kindergartens in Ankara and Istanbul city centers. To support the development of children in the psychomotor field, the thesis was published mostly at Marmara University in 2010.

The publication bias of the studies included in the study was done using the funnel scatter plot, and it was determined that there was no publication bias. While the effect sizes of 28 studies that compose a sample of 1575 people were calculated, 17 studies did not find statistical significance, while 11 studies found a significant difference. As a result of the combining process in the random-effects model, a positive and significant effect size of 0.671 was found in favor of the experimental group. According to Cohen (1998), the common effect size value calculated as a result of meta-analysis is a medium but close to a high level.

In literature, there was no meta-analysis study examining the psychomotor development of pre-school children in our country. However, there are relevant studies done on this subject abroad. It can be said that there is a similarity between the previous studies in the literature and the results of this research. (Burns, Fu & Podlog, 2017; Capelle, Broderic, van Doorn & Ward, 2017; Engel, Broderic, van Doorn, Hardly & Parmenter, 2018; Johnstone, 2018; Wick et al. 2017). In addition to these studies, besides the effects of physical intervention programs on psychomotor development, meta-analysis studies examining the impact of cognitive development and academic success were also found (Alvarez-Bueno et al. 2017; Alvarez-Bueno et al. 2020; de Greeff, Boskerb, Oosterlaand, Visschera & Hartman 2018; Vazou, Pesce, Lakes & Smiley-Oyen, 2019).

Based on the findings of the research, it is recommended that studies related to other development areas of pre-school children can be carried out. Another suggestion is to encourage researchers to make their theses accessible by the National Thesis Center. Also, more systematic and available databases that bring together studies (thesis, articles, and papers) made in any field of science should be created to expand the studies carried out by the meta-analysis method in our country.