# RESEARCH METHOD TRENDS RELATED TO COGNITIVE DEVELOPMENT IN 3-6 AGES BETWEEN 2008-2018 YEARS IN TURKEY

Abstract: The individual's learning process begins with birth and continues with discoveries in the living spaces. The curiosity-driven learning process is the basis of cognitive development, and nowadays, much research is being done to understand this development field. Determining the focal point of research on cognitive development in preschool in Turkey has shed light on the work to be done later. This study consists of theses and articles written in development and education related to the field of cognitive development in children aged 3-6. The study consists of 53 studies chosen randomly from the scientific research published between the years 2008-2018 within the field of cognitive development in 3-6 aged children. The keywords of "cognitive development, mental development, cognition" were applied while searching through the Higher Education Council Theses Center and The Turkish Academic Network and Information Center (ULAKBIM). Twenty-four theses that have been in Higher Education Council Theses Center and 29 articles in The Turkish Academic Network and Information Center (ULAKBIM) were reviewed using content analysis through a form that includes subject areas, data collection tools used in the research, data analysis methods, references, and sample characteristics. In this study, it was found that academic studies of early childhood were focused on 60-72 months. It has been observed that there has been an increase in the number of studies conducted on children aged 0-2 years. The increase in the number of new academic studies on this period, which is critical for brain development, will also prepare a strong ground for understanding and developing the later stages of early childhood.

**Keywords:** Cognitive development, mental development, cognition, pre-school, child development.

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#### INTRODUCTION

Individuals' learning process begins with birth and continues with explorations in their living spaces. As Demirci and Arslan (2020, p.49) point out that the development for of children is not at the same speed. The learning process fed by curiosity, which is the basis of cognitive development and much research has been carried out to understand this development area. Determining the focal points of the research on the cognitive development in the preschool period in Turkey have shed light on future studies.

Cognition is related to the internal process or products of the mind that enable "knowing". It includes all mental activities such as attention, remembering, symbolizing, classification, planning, reasoning, problem-solving, creating, and dreaming. Our cognitive powers are essential for our survival. People rely on cognition in adapting to their environment and changing and transforming it (Berk, 2013). On the other hand, the cognitive development area is a development area that includes all mental processes in the stages of storing, interpreting, rearranging and evaluating information as a result of the interaction of our cognitive powers with the environment starting from birth (MoNE [MEB], 2014). Early childhood is when the child develops the fastest, and two-thirds of the development of the brain structure and functions are completed. Especially children between the ages of three and six become very advanced in their thinking and reflect on the problem before acting. They begin to use a compelling and fascinating new way of reasoning (Santrock, 2016).

According to Piaget, when we examine the points emphasized by cognitive development theorists on children's reasoning processes, preschool years are a transition period in cognitive development. In this period, they can think deeply beyond objects and people that are not in front of their eyes and make predictions about things they cannot influence (Trawick- Smith, 2014). Mental activity cannot be separated from the whole action of the organism. Hence the mental process is considered to be the specific type of biological action. It explains the process by which the organism adapts to the environment and organizes life with schema, assimilation, regulation, and balancing (Wadsworth, 2015). Vygotsky defines cognitive development as "the product of the child's interaction with more experienced and knowledgeable individuals". The four basic principles of his cognitive development system; "The child constructs knowledge, development cannot be considered separate from the social context, learning leads development, and language has an important place in mental development" (Bodrova & Leong, 2010). According to Gagne, the child comes with the innate ability to learn. He learns by processing information. Information is processed and recorded in special areas of the mind. Gagne draws the boundaries of cognitive development as learning signs, learning the stimulus-behaviour relationship, chaining, verbal linking, learning to discriminate, learning concepts, learning principles and problem-solving. The instructive individual should shape the child's learning step by step. In this guiding situation, teachers, parents, and all members of society are responsible for the improvement of cognitive development (cited in Arslan, 2011).

According to Cüceloğlu (1996), it is difficult to research children's cognitive development because of the unobservable processes. Researchers must infer cognitive abilities and changes by observing children's behaviour over time. More studies are needed to increase the methods to facilitate research and understand the early childhood characteristics in-depth and comprehensiveness (Bee & Boyd, 2009). The purpose of this study is to analyze the theses and articles published between the years of 2008-2018 related to cognitive development in children of the 3-6 age group in Turkey. The following sub-problems have been used to reach more detailed information for this aim. Thus, this study is essential to provide anticipation for future research about early childhood.

#### METHOD

This qualitative study used document analysis. Document analysis is a qualitative technique that includes written materials having information on specific events, people, and phenomena. In this study, theses and articles, written on cognitive development of children aged 3-6 published between 2008-2018, were analysed by using the content analysis method to gather similar data within the framework of specific or hidden concepts and themes and to interpret them in a way that the reader can understand (Gülbahar & Alper, 2009; Yıldırım & Şimşek, 2016). Through content analysis, it is aimed to identify the data and

reveal it. The study is limited to development and educational theses and articles published between the 2008-2018 period.

#### SCOPE OF THE RESEARCH

The scope of the research consists of theses and articles written in the field of development and education related to the field of cognitive development in children aged 3-6. Fifty-three publications chosen randomly among the published theses and articles between the years 2008-2018 were surveyed by using the keywords of "cognitive development, mental development, cognition" in Higher Education Council (HEC) Theses Center and The Turkish Academic Network and Information Center (ULAKBIM).

### DATA COLLECTION AND ANALYSIS

Each of the 53 academic studies was analyzed using the form entitled 'Academic Study Review Form' that the researcher developed. The form consisted of "type of academic study", "type of article", "year of publication", "purpose of the study", "subject", "methods and techniques used", "data collection tool", "sample group" and "age ranges". In the research, articles and theses published between the period of 2008-2018 according to selected criteria were examined within the framework of this form. The data obtained are divided into categories and subcategories. These categories and sub-categories are given in Table 1.

| Table 1. Categories                    | Categories of the Academic Stu                        | idy Review Form   |                  |
|--|---|---|------------------|
| -                                      | Sub-categories  |   |                  |
| 1. Type                                | 1.1. Thesis   | 1.2. Article  |                  |
| 2. Years                               |   |   | 2.3. 2015-2018   |
| 3. Article Type                        | 3.1. Research   | 3.2. Theoretical reviews                                      |                  |
| 4.Aim                                  | 4.1. Thought / Perception Review                      |   |                  |
|  | 4.2. Practice   |   |                  |
|  | 4.3. Program Review/Evaluation                        |   |                  |
|  | 4.4. Literature/document Review                       |   |                  |
|  | 4.5. Comparative Description                          |   |                  |
| 5.Research topics                      | 5.1. Cognitive Development and Learning               |   |                  |
|  | 5.2. Rhythm Training and Cognitive Skills             |   |                  |
|  | 5.3. Cognitive Based Social Skills Training           |   |                  |
|  | 5.4. Cognitive Style and Play                         |   |                  |
|  | 5.5. Parental Attitudes and Cognitive Development     |   |                  |
| 6.Research methods and designs         | <u>6.1. Qualitative</u>                               | <u>6.2. Quantitative</u>                                      |                  |
|  | 6.1.1. Content Analysis                               | 6.1.4. Percentage / Frequency/Average / Standard<br>Deviation |                  |
|  | 6.1.2. Descriptive Analysis                           | .1.2. Descriptive Analysis                                    |                  |
|  | 6.1.3. Frequency Analysis                             | 6.2.2. T- Test  |                  |
|  |   | 6.2.3. ANOVA/MAI  | NCOVA            |
|  | 6.2.4. Factor Analysis                                |   |                  |
|  | 6.2.5. Regression                                     |   | /515             |
|  |   | 6.1.5. Non-Parame   | otric Tasts      |
|  |   | 6.3. Mixed  |                  |
|  |   | 6.1.6. 6.3.1. Explanatory Sequential                          |                  |
|  | 6.4. Review   |   |                  |
| 7. Data collecting tools               | 7.1. Observation 7.2. Interview 7.3. Achievement Test |   |                  |
| 7.4. Documents 7.5. Personal Informati |   |   | 15               |
| 8. Sample                              | 8.1. Preschool Pupils                                 | 8.2. Parents  | 8.3. Teachers    |
| 9. Age                                 | 9.1. 36-48 Month 9.2                                  | . 48-60 Month   | 9.3. 60-72 Month |

## **FINDINGS**

In this study, 53 publications consisting of articles and theses were analyzed. The distribution of the studies is given in Figure 1. The publications consist of 24 theses and 29 articles. 22 of the theses are master's and 2 of them are doctoral dissertations. The articles were evaluated according to 3 criteria; Articles published in international refereed journals (20), national refereed journals (7) and national journals (2).

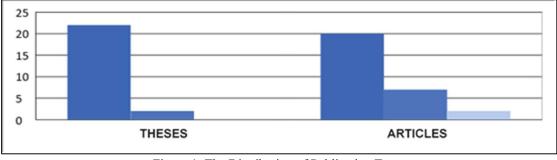


Figure 1. The Distribution of Publication Types

The results obtained through the analysis according to the years of publication shows that the number of studies published between 2008-2010 is 13, between 2011-2014 is 15, and between 2015-2018 is 25, as was seen from the Figure 2.

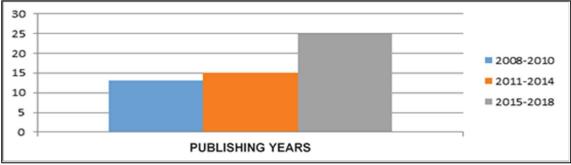


Figure 2. The Distribution of Publication Year Range

It is seen that research increased the most between the years of 2015-2018. It is seen that recent research on cognitive development area period of 3-6 years is interesting and developing in Turkey. No content analysis studies examining the studies on cognitive development in early childhood have been found in the literature. Some studies generally examine studies on early childhood. In the study conducted by Bertan et al. Between 2000 and 2007, which included the compilation of studies on early childhood development, 6.1% of 326 studies included the 3-4 age group and 44.1% included the 5-6 age group (Bertan et al., 2009). Aksoy & Koran (2016) analyzed 40 studies about infancy in Turkey; 29 (72.5%) of them carried out between 2010-2014 and 11 (27.5%) of them between 2004-2009. Metin and the others analyzed 85 theses related to 0-3 years age children in Turkey between the years 1994-2016. It was determined that the most research was 60 master theses (36.5%) between 2005-2009. Also, it was seen that there were few doctoral dissertations for children aged 0-3. In the relevant research, it was stated that 21 master theses and four doctoral dissertations were conducted between the years 2010 and 2016 (Metin et al., 2017). It is observed that there has been an increase in academic studies on early childhood in Turkey in recent years. However, this increase is weak in terms of in-depth and longitudinal studies. It is thought that studies that include different dimensions of early childhood and show a holistic approach will contribute to interdisciplinary research.

It can be seen in Figure 3 that there are 22 research articles and seven theoretical/ review articles. In this study, it was seen that the articles published on cognitive development in children aged 3-6 mainly were research articles. Likewise, Bertan et al. investigated the studies on early childhood development between 2000 and 2007, and it was determined that 107 of 326 studies were research articles and 52 were review articles. Research articles start with the aim of solving a problem and end with report writing. It is necessary to collect, analyse, interpret, and evaluate the data in a systematic and planned manner to move from the current situation to the desired state (Karasar, 2006). Review studies are also needed to define the overall tendencies of research and to make general inferences. The increasing number of review studies will create an effective reference list to apply more systematic analysis on early childhood

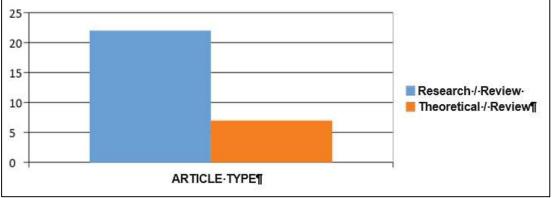


Figure 3. Distribution of the Articles According to Research Types

In Figure 4, it is seen that there are 5 thought/perception studies, 40 practical studies, 3 literature/document reviews, 2 comparative descriptions and 3 other studies (scale development, software development, etc.).

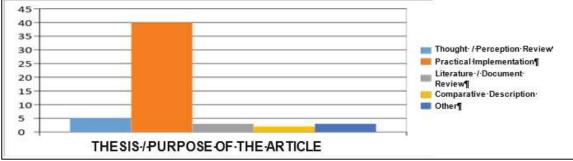


Figure 4. Distribution of Publications According to the Aims

Figure 5 shows that researchers studied subjects of cognitive development and learning (30), rhythm training and cognitive skills (1), cognitive-based social skills training (9), cognitive style and play (7), and parental attitudes and cognitive development (6). It was stated in the study conducted by Bertan et al. that 200 of the 326 studies were related to education and 126 were related to health issues (Bertan et al., 2009). Aksoy and Koran declared (2016) in their study examining the infancy research in Turkey that 18 of research subjects (45%) related to the development areas. When the development areas are examined in detail, it is noticed that there are five research on social-emotional development (attachment), two research on language development, two research on neurological development, one research on personality development, one research on physical, psychological and mental development, one research on cognitive and language development, 1 research on motor and cognitive development.

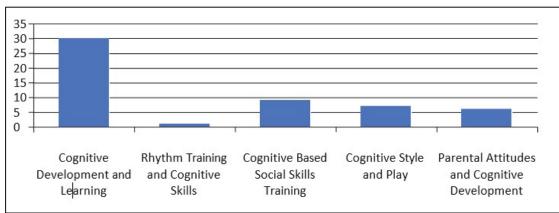


Figure 5. Distribution of Publications According to Their Subjects

As shown in Figure 6, the quantitative, qualitative and mixed-method categories were created in the research method and design theme. There are 42 studies conducted through the quantitative method, seven

studies with the qualitative method, and 1 with the mixed method. Also, there are three review studies. Most of the studies in the field of cognitive development in 3-6 age period in Turkey between the years 2008 and 2018 have been done by quantitative research method, which is similar to the research of Aksoy and Koran (2016). According to the study results, it was determined that 28 (70%) of the research were done by quantitative method and 12 (30%) of them were conducted as review studies. In addition, Metin et al. (2017) analysed 85 theses related to 0-3 years of age children in Turkey between the years 1994-2016. It was observed that screening (82.4%) and experimental (63.2%) designs were primarily used in master's theses, while experimental method (36.8%) was used in doctoral dissertations in their research. Experimental method tries to reach scientific information most objectively; thus, it is indispensable for qualified academic studies.

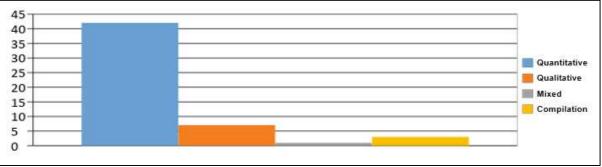


Figure 6. Distribution of Publications According to Their Methods and Designs

It was seen in Figure 7 that the pre-experimental designs were used in 16 of the studies, correlational survey designs were used in 19 of the studies, and descriptive survey designs were used in 7 of them.

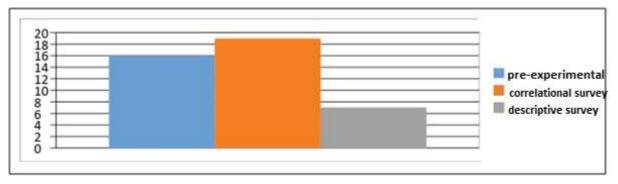


Figure 7. Distribution of Quantitative Designs

It was determined that three phenomenology studies, three case studies and one concept analysis study were administered in qualitative designs (Figure 8). In the study conducted with the mixed method (1), the "sequential explanatory mixed method" (Creswell, 2003) was used, in which the quantitative study was performed first, and then these data were supported with qualitative data.

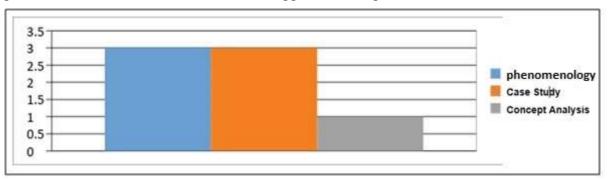


Figure 8. Distribution of Qualitative Designs

According to the data collection tools shown in Figure 9, it was seen that the observation technique (1) was performed as "non-participant observation", and the interviews were conducted using the "structured"

(1) and "semi-structured" interview (2) techniques in the studies. It was observed that achievement tests are also conducted in open-ended (13) and closed-ended (20) forms. It was determined that attitude/perception/personality/ability tests were also performed with open-ended forms (8) or recording the answers given to the questions asked by the researchers or recording the responses to the comments made on the pictures (6). In addition, it was determined that the data were also collected by using various documents (portfolios etc.) (6), and personal information forms (22).

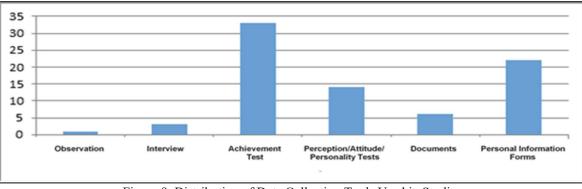


Figure 9. Distribution of Data Collection Tools Used in Studies

Figure 10 shows that 37 studies were conducted with preschool children, 7 with parents, and 9 with teachers.

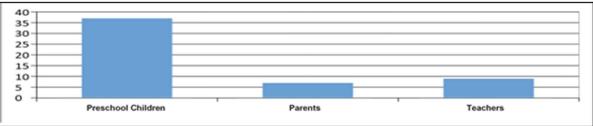


Figure 10. Distribution of Sample/study Groups

According to the data analysis methods in the study, it was stated that the quantitative analysis methods were listed as follows: Percentage/frequency/mean/standard deviation 32, correlation 11, t-test 18, ANOVA/MANCOVA 14, factor analysis 2, regression 3, and non-parametric tests 17 (Figure 11).

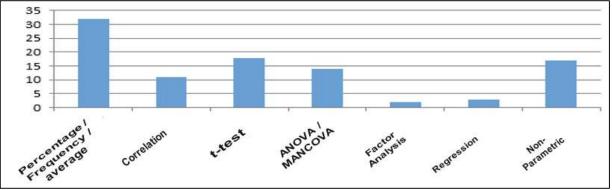


Figure 11. Distribution of Data Analysis Methods in Quantitative Studies

The following methods were used in qualitative data analysis; Content analysis 6, descriptive analysis 3 and frequency analysis 1 (Figure 12).

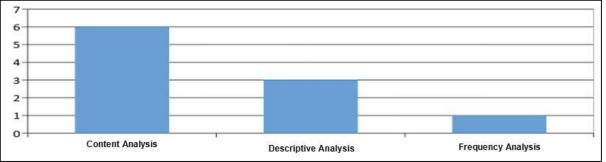


Figure 12. Distribution of Data Analysis Methods in Qualitative Studies

Finally, the age ranges in academic studies are listed as follows; 6 studies with 36-48 months, 16 studies with 48-60 months, 29 studies with 60-72 months (Table 13). The most intensely researched period was identified as 60-72 months. Studying cognitive development in children is difficult because it involves unobservable processes. Researchers must observe children's behaviour over time and infer cognitive abilities and changes (Cüceloğlu, 1996). According to Berk (2013), children aged 5-6 (60-72 months) have self-awareness of speaking about their personal experiences and inner mental life. Therefore, it may be thought that the 5- 6 age period is more preferred by researchers to collect reliable data. It has been determined that age of 3-4 is the least preferred period in the academic studies reviewed. However, the age of 3-4 is the process in which the neural connections of the brain are formed and organized by the experiences gained through stimuli in the first years of life (Metin et al., 2017). Research to be conducted with children in this period will provide insight in terms of supporting all developmental areas and raising them in accordance with their existing potential.

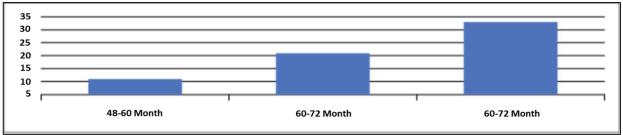


Figure 13. Distribution of Age Periods of 3-6 Years Old Children

## DISCUSSION AND CONCLUSION

The scope of the research consists of theses and articles written in development and education related to the field of cognitive development in children aged 3-6. The sample consists of 53 studies chosen randomly from the scientific research published between the years 2008-2018 on the cognitive development field in children aged 3-6, as a result of the search with the keywords "cognitive development, mental development, cognition" on the HEC Thesis Center, ULAKBIM and HEC Academic web pages. It is seen that academic studies increased between the period of 2015-2018 gradually. This situation suggests that cognitive development in the 3-6 age period is interesting in recent studies and follows an ongoing process in Turkey. No content analysis studies are examining the studies on cognitive development in early childhood in the literature. However, some studies examine studies on early childhood in general (Aksoy & Koran, 2016; Bertan, 2009; Metin, 2017). According to the article types, it was found that there were 22 research articles and seven review articles. It has been observed that studies on cognitive development in children aged 3-6 are mostly research articles. Studies in a research article begin with the aim of solving a problem felt and end with writing a report. A research article begins with the aim of solving a perceived problem and ends with the writing of a report. It is necessary to collect, analyze, interpret and evaluate data in a systematic and planned manner against problems in order to move from the current situation to the desired state (Karasar, 2006). There is a need for review studies in order to define the general tendencies of research studies and to reach general inferences. An increasing number of review studies will play an active role in the systematic realization of early childhood research. In the study, subjects of cognitive development and learning (30), rhythm training and cognitive skills (1), cognitive-based social skills training (9), cognitive style and play (7), and parental attitudes and cognitive development (6) were studied by researchers. Quantitative, qualitative, and mixed-method titles were created in the context of the research design/article method. Forty-two of the investigated studies were made using the quantitative method, seven were qualitative, one was mixed-method, and three were reviewed. Most of the studies in the field of cognitive development in 3-6 age period in Turkey between the years 2008 and 2018 have been done by quantitative research method.

It has been found related to the mostly studied topics in the literature were cognitive development and learning (20), rhythm study and cognitive skills (1), cognitive-based social skills training (9), cognitive style and play (6), parental attitudes and cognitive development (6). Kırman and Doğan (2017) conducted a study in which they organized their studies on mother-father-child relationships. In this study, they observed that mostly focused studies were found under the headings of scale development and validity-reliability studies on parent-child relationships, communication among parents and children, the relationship between children with social skills, behaviours and behavioural problems, and factors affecting parent-child relationships. In Yalçın and Dede's (2018) similar studies, it was concluded that the theses about parents and children in early childhood are mostly based on the parent-child relationship, parent views, parent and teacher relationship. In addition, Çifçi and Ersoy (2019), in their analysis study related to research orientations in preschool education, found that the mostly studied research topics were education and training problems, developmental areas, teaching materials, teacher education, family participation, curriculum studies, activity types, learning models, values education, environmental education, games, special education and mathematics education.

Within the scope of the study, quantitative, qualitative and mixed-method titles were created by considering the research design/method. While 42 of the investigated studies were conducted using quantitative methods, seven were qualitative, one was a mixed-method, and three were reviews. Academic studies done within 3-6 years of cognitive development between 2008-2018 in Turkey were performed through quantitative research methods intensely.

The meta-analysis studies realized by Koç and Saranlı (2017), Yalçın and Dede (2018) on academic publications in early childhood and Çifçi and Ersoy's study (2019) on research orientations in preschool education were examples of the studies supporting this result. It was determined that quantitative research methods were generally preferred in theses, and articles in early childhood and non-experimental survey models were used. On the other hand, recent studies have generally been done using a mixed-method in line with the general academic trends.

Finally, the age ranges in academic studies are listed as follows; 6 studies with 36-48 months, 16 studies with 48-60 months, 29 studies with 60-72 months. The most intensely researched period was identified as 60-72 months. Studying cognitive development in children is difficult because it involves unobservable processes. Researchers must observe children's behaviour over time and infer cognitive abilities and changes (Cüceloğlu, 1996). According to Berk (2013), children aged 5-6 (60-72 months) have self-awareness of speaking about their personal experiences and inner mental life. Therefore, it can be thought that researchers more prefer the 5-6 age period to collect reliable data. It has been determined that the age of 3-4 is the least preferred period in the academic studies reviewed. However, the age of 3-4 is how the neural connections of the brain are formed and organized by the experiences gained through stimuli in the first years of life (Metin et al., 2017). Research to be conducted with children in this period will provide insight into supporting all developmental areas and raising them under their existing potential.

#### SUGGESTIONS

Thesis and articles published between the years 2008-2018 related to cognitive development in children of 3-6 age group in Turkey were discussed. Future studies can be conducted by examining theses and articles on different developmental areas in early childhood.

It has been observed that the quantitative method is generally preferred in the academic studies examined within the scope of the research. The mixed method was defined by Creswell (2003) as follows: "mixed method was used in the field of health, social and behavioural sciences where the researcher integrates two data sets in which he collects both quantitative data (closed-ended) and qualitative data (open-ended) to understand research problems, and then draws conclusions using the advantages of integrating these two data groups". Although these advantages, mixed method was preferred less. Thus, the intensity of

using mixed methods should be increased in order to obtain more reliable findings in future studies. In this study, it was found that the 60-72 months period was emphasized in the academic studies examined on early childhood. Recently, there has been increasing in the number of studies on children aged 0-2 compared to the past. Therefore, increasing researches on this period, which is essential for brain development, will prepare a solid ground for understanding and developing the later stages of early childhood from different perspectives.

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