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## Author Contribution Statement


**[1] Ensar YILDIZ**
*Dr.*
Sivas Cumhuriyet University, Turkey

Conceptualization, literature review, methodology, implementation, data analysis, and writing

**[2] Ayşegül ÖĞÜTCEN**
Hacettepe University, Turkey

Conceptualization, literature review, methodology, implementation, data analysis, and writing

**[3] Berrin AKMAN**
*Prof. Dr.*
Hacettepe University, Turkey

Conceptualization, literature review, methodology, data analysis, and writing


## Abstract


The purpose of this study is to disclose the practices of parents regarding the development of mathematical skills of their preschool children in their home environment during the Covid-19 pandemic. The research uses an explanatory case study as one of the types of case studies included in qualitative research methods. The sample selection of the research uses criterion sampling as one of the purposeful sampling types. In line with this, the study group consisted of 30 parents. The data of the research were collected using the interview technique. The data were obtained by using a semi-structured interview form developed by the researchers. The study concluded that parents perceive early math skills as daily life skills rather than a part of math skills and their knowledge about early math skills is inadequate. In the study, it was observed that during the pandemic period, preschool teachers generally did not make suggestions to support early math skills to parents, while parents used workbooks to support children's early math skills at home during the pandemic period, they made their children do addition and subtraction operations and made them count numbers. Based on the findings obtained at the end of the research, it is recommended to organize supportive training to increase parents' knowledge about early math skills and about methods for teaching these skills.


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***Research Article***

# The Mathematics Process in Home Environments of Preschool Children in the COVID-19 Pandemic: Views of Parents *

**Ensar YILDIZ**[1], **Ayşegül ÖĞÜTCEN**[2], **Berrin AKMAN**[3]

**Abstract**

The purpose of this study is to disclose the practices of parents regarding the development of mathematical skills of their preschool children in their home environment during the Covid-19 pandemic. The research uses an explanatory case study as one of the types of case studies included in qualitative research methods. The sample selection of the research uses criterion sampling as one of the purposeful sampling types. In line with this, the study group consisted of 30 parents. The data of the research were collected using the interview technique. The data were obtained by using a semi-structured interview form developed by the researchers. The study concluded that parents perceive early math skills as daily life skills rather than a part of math skills and their knowledge about early math skills is inadequate. In the study, it was observed that during the pandemic period, preschool teachers generally did not make suggestions to support early math skills to parents, while parents used workbooks to support children's early math skills at home during the pandemic period, they made their children do addition and subtraction operations and made them count numbers. Based on the findings obtained at the end of the research, it is recommended to organize supportive training to increase parents' knowledge about early math skills and about methods for teaching these skills.

**Keywords:** Early mathematic skills, view of the parent, Covid-19 pandemic

## 1. INTRODUCTION

The Covid-19 pandemic, which began in China in 2019 and soon became a global epidemic, has affected many areas of life in a negative way (TEDMEM, 2022). During the pandemic period, 1,326,123 children in the preschool period were affected by the interruption of education activities in Turkey (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020). The research results on this topic show that preschool children are missing the opportunity to learn mathematics and to study in social environments during the Covid-19 pandemic (Stites, Sonneschein & Galczyk, 2021). Educational activities started to be carried out through distance education on March 23 of 2020, in formal education institutions affiliated with the Ministry of National Education (MoNE, 2020). Based on this, as the time spent at home by children increased, the responsibility of parents in their children's education in the home environment increased (Brossard, Cardoso, Kamei, Mishra, Mizunoya, & Reuge, 2020) and parents had a critical position in children's access to education (Logan, Ogurlu, Garbe & Cook, 2021). In the long term, parental involvement in learning processes is important for children to become successful (Hapsari, Sugito, Fauziah, 2020), independent, productive and responsible individuals (Cousins & Mickelson, 2011).

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[1] *Dr., Sivas Cumhuriyet University, Faculty of Education, ensaryildiz@outlook.com.tr, Sivas, Turkey*

[2] *CoHE 100/2000 PhD Scholarship Holder, Hacettepe University, aysegulogutcen@gmail.com, Ankara, Turkey*

[3] *Prof. Dr., Hacettepe University, Faculty of Education, bakman@hacettepe.edu.tr, Ankara, Turkey*

*Corresponding Author e-mail adress: aysegulogutcen@gmail.com*

The formal and informal experiences with mathematical content during early childhood support children to learn mathematical information. These learnings take place in environments where the child interacts such as school and home (Lefevre, Skwarchuk, Smith-Chant, Fast, Kamawar & Bisanz, 2009). In addition to the activities performed by teachers, the development of the mathematical skills of children can be achieved through the support of parents (Karakuzu & Koçyiğit, 2016). Mathematical skills include one-to-one matching, perceiving and counting numbers, ordering, classification, comparison, geometry, spatial perception, connections such as part-whole relations, measuring, graphing, and performing mathematical operations. (Charlesworth & Lind, 2007). Early math skills such as pairing, grouping, and sequencing play a role in the individual's understanding of life (Yıldırım-Hacıibrahimoğlu, 2019), but they also predict long-term academic skills and readiness for primary school (Huntsinger, Jose & Luo, 2016). At this point, parents play an important role. The beliefs of parents about their children's development, learning, and the roles they assume, affect children's interactions with math activities (Sonnenschein, Metzger & Thompson 2016; Sonnenschein, Stites & Dowling, 2021). These activities which include mathematical content carried out by parents also predict children's arithmetic performance (Skwarchuk, Sowinski & Lefevre, 2014). It is seen that mathematics is taught formally and informally in studies examining the interactions of parents with their children including mathematical content (Levefre, et al., 2009). To increase children's arithmetic skills, parents' direct and explicit instruction on number, quantity, or arithmetic is defined as formal activities. Arithmetic activities are defined as informal arithmetic activities where the main purpose is not to teach about numbers, quantity, or arithmetic, but activities such as playing games on the scoreboard, making measurements in art, and kitchen activities (Skwarchuk, Sowinski & Lefevre, 2014).

Review of studies on the views of parents on the distance education process during the covid-19 pandemic, indicated that parents' do instructional activities on mathematics (Stites, Sonneschein & Galczyk, 2021). Haktanır (2021), in his study, which examined the parents' levels of support for skills such as mathematics and readiness to literacy in the home environment, concluded that parents' support levels for these activities were moderate. It is important to reveal the support of early mathematics skills, which is important to support in the early period, in the home environment during the pandemic period, how much and how mathematics is included in the process, in terms of guiding teachers who shed light on parents and parents in the pandemic. Thus, with the present results, there will be a guide to support early mathematic skills in the home environment in the future.



- The current study which aimed at revealing the processes related to the development of children's mathematical skills in the home environment of parents who had children in the preschool period during the Covid-19 pandemic, addressed the following research questions: How do parents define early mathematics skills?
- What do skills like matching, ordering, classification, and grouping mean to parents?
- What kind of math-related materials do children play with within their home environment?
- Do parents include mathematics in their conversations?
- What mathematical activities do parents do with their children?
- What are the mathematical skills that should be acquired in the preschool period according to the parents?
- During the pandemic period, what is the role of teachers in supporting children's early math skills according to parents' views?
- Do parents need support to develop their children's early mathematics skills?

## 2. METHOD

### 2.1. Research Model

This study is designed as an explanatory case study, which is one of the case study types included in qualitative research methods, and criterion sampling was determined from the purposeful sampling types in the sample selection in this study.

### 2.2. Study Group

The sampling criterion was, “having a child aged between 3 and 6 years old, who attended preschool education during the pandemic period”. Accordingly, the study group consists of 30 parents. Qualitative research can also be conducted with purposefully selected small samples, sometimes even using a single sample (Patton, 2014). Of the 30 parents included in the study group, 8 of them live in Istanbul, 8 in Sivas, 7 in Denizli, 2 in Ankara, 1 in Samsun, 1 in Kayseri, 1 in Aydın, 1 in Izmir, and 1 in Kırşehir. Of the parents, 3 are primary school graduates, 5 are high school graduates, 3 hold associate degree, 16 hold undergraduate, and 3 hold graduate degree. Looking at the professions of the parents, 12 of them are housewives, 7 of them are teachers, 7 of them are civil servants (4 university employees, 2 police officers, 1 expert), 2 are engineers, 1 is a lecturer and 1 is a banker. 21 of the parents have 2 children, 5 of them have 1 child, 3 of them have 3 children and 1 of them has 4 children. The children of 24 parents go to public school, and 6 of them go to private school. Considering the distribution of children according to their ages, it was seen that 4 of them were aged between 36-48 months, 8 of them were aged between 49-60 months and 18 of them were aged between 61-72 months.

### 2.3. Data Collection Tool

*2.3.1. Semi-structured interview form of the parents on the mathematics process of the preschool children in the home environment in the covid-19 period*



The data in the study were collected using the "Semi-structured Interview Form of the Parents on the Mathematics Process of the Preschool Children in the Home Environment in the Covid-19 Period" developed by the researchers. After the feedback from three experts, the questions "What do the matching, sorting, classification, and grouping skills mean to you? and What kind of materials (other than toys) does your child play with at home?" were added. Pilot interviews were conducted with three parents to understand whether the form, which was prepared in line with expert opinions, was understandable and whether the questions were functional. The clarity of the questions and whether the answers included answers to the questions were examined by both researchers and an expert. After it was concluded that the questions provided the desired data, the main data collection process started.

### 2.4. Data Collection Process

In the interviews, the same questions were asked to all participants in the same order (Corbetta, 2003). The researchers stated to the interviewees that the interviews would be used only for this research and that no personal information would be included in the interviews and that they would be used by giving codes. The interviews lasted approximately 20 minutes. Interviews were conducted using telephone and online platforms (Zoom, Skype) due to the pandemic period. The number of participants was deemed sufficient after it was seen that data saturation was achieved and the answers were repeated. The interviews were converted into written documents and were stored by giving codes such as “P1, P2, P3, …, P30”. The form consists of two sections. In the first part, which includes demographic information, answers are sought for questions about educational status, occupation, place of residence, number of children, children's ages, children's gender, and the age of the child receiving

preschool education. In the second part, there are ten interview questions such as "How do you define early math skills? What skills do you say when you say early math skills? How did you spend time at home with your child during the pandemic period? What kind of study/activities did you do about math with your child at home during the pandemic? What kind of activities did your teacher do to improve your child's math skills at home during the pandemic period? Do you need any support to improve your child's math skills during the pandemic period?".

### 2.5. Data Analysis

The content analysis technique suggested by Mayring (2004) was used to create codes and categories in the examination of written documents in the research, and the data were analyzed using the MAXQDA Analytics Pro 2018 (18.2.5) program. In content analysis, the process must be organized with a communication model, and regularity, central themes, validity, and reliability criteria must be provided. In this context, in order to make inductive categorization, first, the interviews were transcribed, the codes were created from the written texts, then the codes were combined under categories by paying attention to the meaning context, and the themes were created. 20% of the answers that were transcribed were sent to an expert in preschool education to increase the reliability of the coding of the data. In this way, multiple coding was done (Barbour, 2001). In line with expert opinion, the theme of skill areas that should be supported according to parents was divided into three categories: operations, early math skills, and numbers.

Lincoln and Guba's (1986) credibility, consistency, transferability, and confirmability stages were used. The literature has been reviewed and references are given to related studies. Opinions of three field experts were taken during the creation of the form. In addition, an expert in the field was consulted in the analysis of the data. The interviews were made on a voluntary basis, and the participants were ensured the confidentiality of the data. Written documents were stored by giving codes as "P1, P2, P3, …, P30". See appendix 1 to get a clearer picture of the research and data analysis process.



## 3. FINDINGS

Based on the findings obtained at the end of the study, many parents have been found to think of numbers/counting, addition, and subtraction as early mathematics skills. In addition, it has been determined that parents describe matching, sorting, classification, and grouping skills as life skills. It was concluded that the majority of the parents participating in the study did not need any support for the development of children's mathematical skills during the pandemic period.

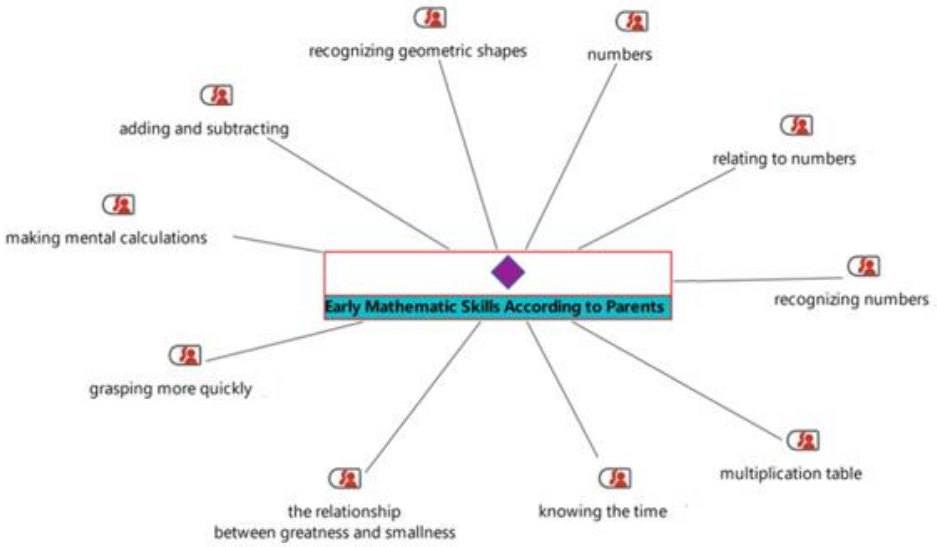


**Figure 2. Early mathematic skills according to parents**

In Figure 2, the codes

for recognizing numbers, relating to numbers, numbers, recognizing geometric shapes, adding and subtracting, making mental calculations, grasping more quickly, the relationship between greatness and smallness, knowing the time, and multiplication table were created in Figure 2 regarding the theme of early mathematics skills. Some of the parents' views that mediated the creation of the codes are given below:

> P3: *"Knowing the numbers, I mean so. Knowing how many there are, knowing the time, I mean recognizing the numbers. For me that is all."*
>
> P6: *"Counting can be related to greater/smaller relation. This of course can be a greater/smaller relationship between objects, either in number or visually. It can be simple addition, operation, or four operations skills. Addition, subtracting, reducing of something, or increasing. They might be such things like that. Perhaps not 3-dimensional objects, but to be able to recognize a 2-dimensional square, rectangle, or geometric shapes. These might be included."*

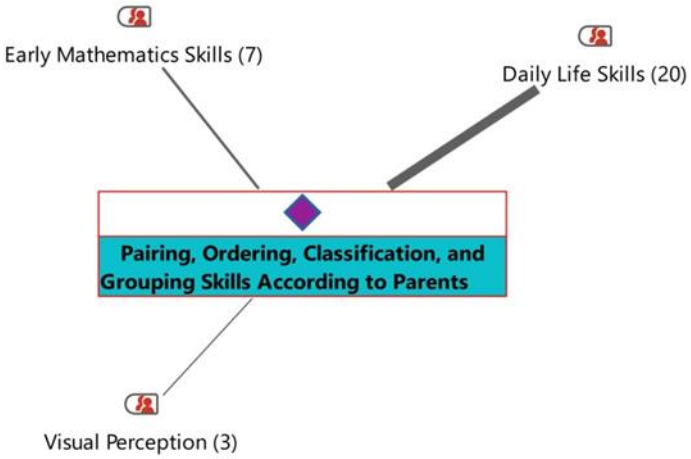


**Figure 3. Pairing, ordering, classification, and grouping skills according to parents**

In Figure 3, according to the views of the parents, the categories of Daily Life Skills, Early Mathematics Skills, and Visual Perception were created regarding the theme of matching, ordering, and grouping skills. Examples of parent's views that form the basis for the creation of these categories are given below:

> *P6: "It is great that you said that. These are also actual mathematical skills. Of course, I couldn't portray it when I said it all of a sudden. I think that these are also mathematical skills."*
>
> *P18: "I think of visual perception and daily life skills. He must perceive what he sees so that he can match and classify them. For this reason, these skills seem to me first as visual perception. I can also say things that make me think that it is a daily life skill, such as looking around to find the other socks at home, or my son's playgroup being divided into two groups and playing in the street while he is playing."*

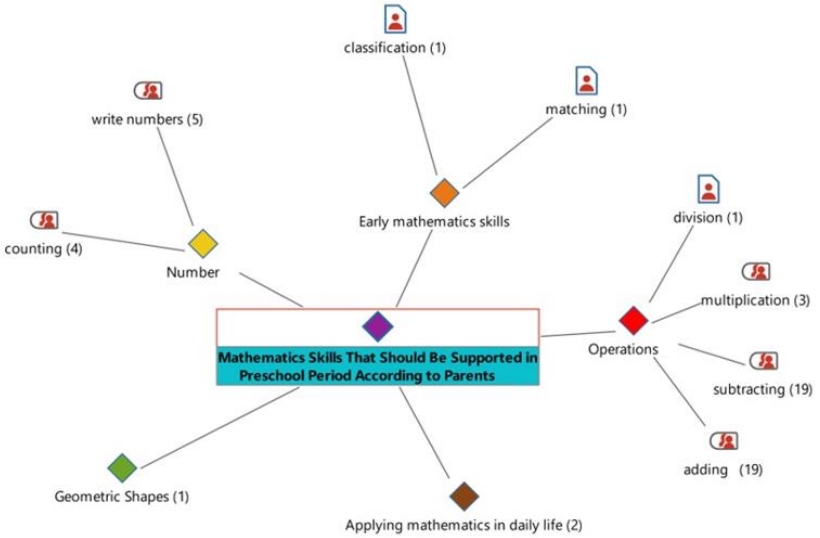


**Figure 4. Mathematics skills that should be supported in preschool period according to parents**

In Figure 4, the categories of Operations, Early Mathematics Skills, Numbers, Geometric Shapes, and Applying Mathematics in Daily Life were created related to the theme of mathematical skills that should be supported according to the parents. The codes of addition, subtraction, multiplication, and division were used in the creation of the operation category.

P18: *"He needs to learn numbers especially well, to be able to do things like counting by fives, and counting in simple ways. I think that they should learn operations such as addition and subtraction, and making subtraction using their fingers. He also uses mostly addition and subtraction in daily life. In order to be able to do this, he needs to know the numbers very well."*

P28: *"Well, like I said, he needs to make visual matchings. If he is going to buy 5 pens for his friends he should be able to buy 5 pens without counting them in his mind. He should know its number and take it without seeing anything concrete. I think he should do things like addition, subtraction, and matching to meet his daily needs."*



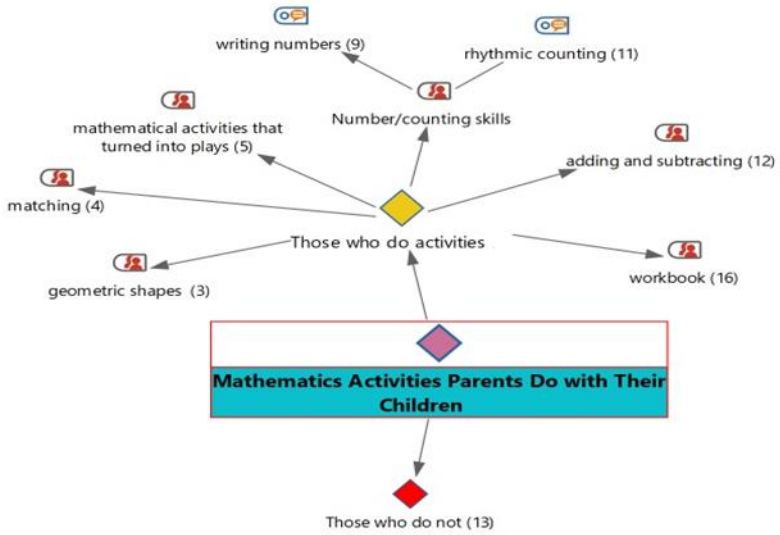


**Figure 5. Mathematics activities parents do with their children**

When Figure 5 is examined, two categories, "Those who do activities" and " Those who do not", were created regarding the theme of mathematical activities done with children. In the creation of the "Those who do activities" category, codes of number/counting skills, mathematical activities that turned into plays, matching, and geometric shapes were utilized to create " activities done " category.

P12: "*For example, we played with balls. We played with balls the most. I'll tell you that. It's called marbles, you know, you line up marbles, you throw them. How many did you collect from the right head, from the left head here? How many marbles each of us have left? Everyone put four, or three each. Like how much everyone has. How many marbles each of us have left after the last play is over? Like that way you know. For example, this is mathematics, you know, a mathematical play… We also had a game with hippopotamuses. It was about the one who gets the most marbles. Like that."*

P19: *"His father bought a homework book. Generally, we use that. There are activities to be done, things like which tree has more apples in it. Also, the workbook guides us about exactly what we need to work on. Otherwise, if it were up to me, I would consider practicing things like memorizing numbers, writing numbers, or adding and subtracting."*

*I bought some fun math kits. Toys related to math are being sold. The numbers are like plus and minus. So that you can see it. She shows her comprehension of numbers by saying things like an apple and a duck. Then there was the matching such as matching the number two with the box with two pencils. Then there was the collection. This time we are adding, I mean we are putting them together. It's like bringing three toys with two toys and counting.*

P27: *"He mostly played with his siblings, now that I have an 8-month-old child. . That's why I would be lying if I said that I played. His father also came home tired as his father often went to work."*



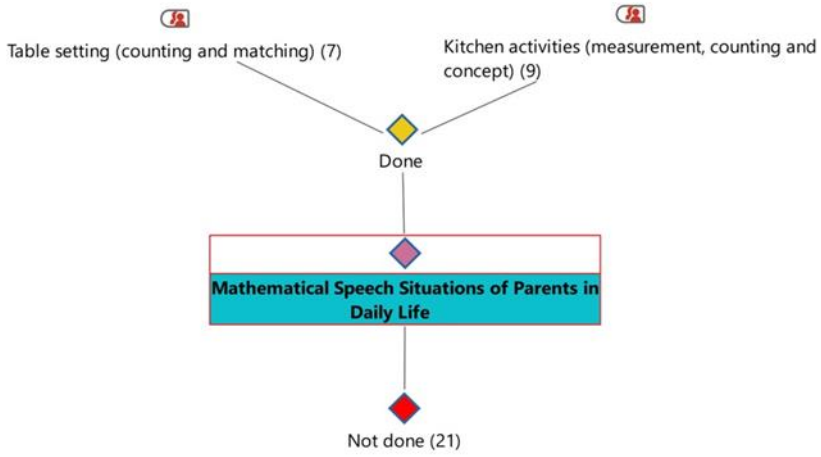


**Figure 6. Mathematical speech situations of parents in daily life**

In Figure 6, categories such as activities are done and not done and were determined regarding the theme of mathematical speaking in daily life. Codes for kitchen activities and table setting were created for the category of doing.

*P20: "I do not know how much it can be regarded as conversation on mathematics but when I'm making a cake, I give my daughter commands like give me three eggs, and also tell her the process by saying: "we put a glass of milk, a teaspoon of baking soda"; just like writing a recipe.."*

*P23: "Especially when setting up the table, my daughter puts forks and spoons according to where we will sit. He puts smaller cutlery on the place where her brother and herself will sit. Rather than counting like one, two, or three, when taking it out of the drawer, she takes it to the table by matching it by saying it is my mother's spoon and it is my father's spoon.*

*P24: I set the table myself in case a plate or something breaks; I have never asked such a thing from my child until now. I don't know why but when making cakes, I also prepare everything, I just give him a piece of dough, she shapes it the way she likes and cooks and eats. Since I'm very meticulous, I don't let my daughter get close in case a hair or something else falls in, but now that you asked me about that; I think maybe I could make her realize what numbers and quantities do in daily life."*

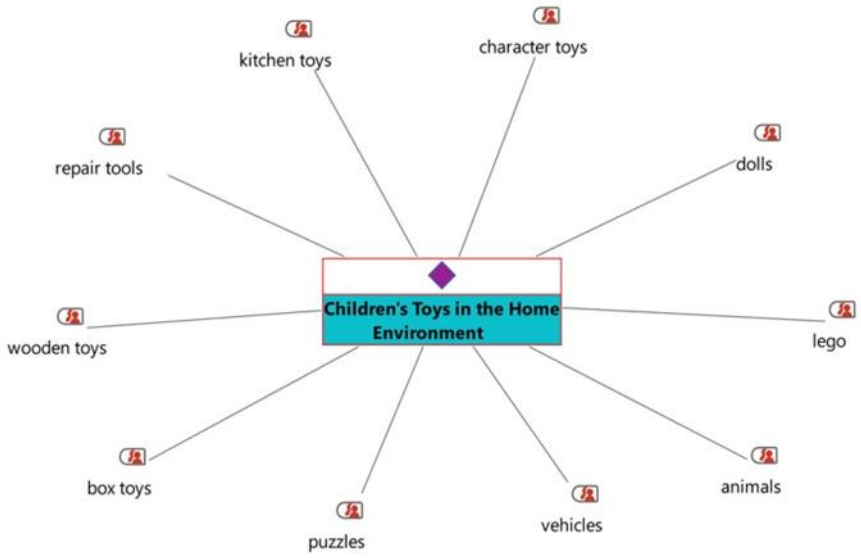




**Figure 7. Children's toys in the home environment**

When Figure 7 is examined, codes for lego, dolls, character toys, box toys, kitchen toys, wooden toys, board games, puzzles, vehicles, and animals were created according to the parents' views on the theme of the child's toys.

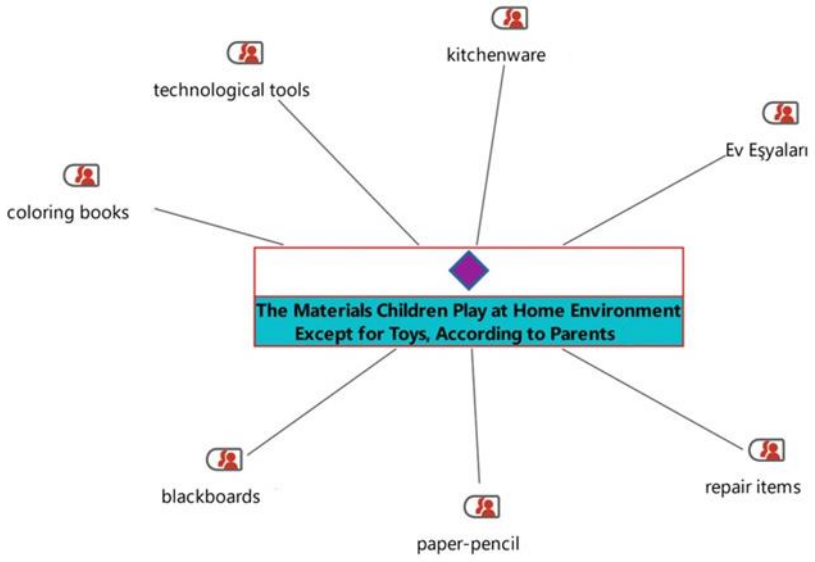


**Figure 8. The materials children play at home environment except for toys, according to parents**

When Figure 8 is examined, codes for household items, kitchenware, technological tools, coloring books, blackboards, paper pencils, and repair items have been created related to the theme of materials that children play with other than toys. Sample parent views on the creation of codes are given below:

P2: *"Robot, electrical stuff. Battery-powered stuff in the house. He usually plays with battery-powered devices, and mostly with batteries. When we go to the toy store or the market, he looks for the batteries. He likes to open the inside of the toys afterward. He doesn't like Legos. He does not like to do something in accordance with a directive, he gets bored. He doesn't like to paint or do that kind of stuff. But the screwdriver, then the hammer, then the little electronic things, the things I use at home, he knows these. He can play for a long time with such things, or a simple toy made of wood, or he likes to make them. Like that…… He plays with things other than the toys... He doesn't play much with the toys, he either plays with the things in this house or in the cabinets or at work, he takes out the screwdrivers, he takes out the small screwdrivers and opens the toys then change the batteries. For example, we plant flowers, and he likes to play with soil. He mostly likes to spend time outside."*

P12: "*My son plays lego the most. He's doing jigsaw puzzles. He is mostly interested in two things. Other than that, he doesn't have much to do with sports. He mostly doesn't play with balls. He doesn't ride the bike much. Usually, he is at his desk. He paints, draws something; collects and subtracts things. My son invents things. He connects, unties, and glues the items in the house. He invents all the time… As I said, for example, when the toilet paper runs out, he makes binoculars out of a toilet paper roll, then makes a microphone. For example, when you run out of something at home, you buy something from the market. In our house, no item's box can be thrown away. I secretly throw them away. He's always trying to invent something like that with them. He's making a trap, he's making a space shuttle, he's making an imaginary thing, you know, making a teleportation machine. I mean, he does stuff like that."*



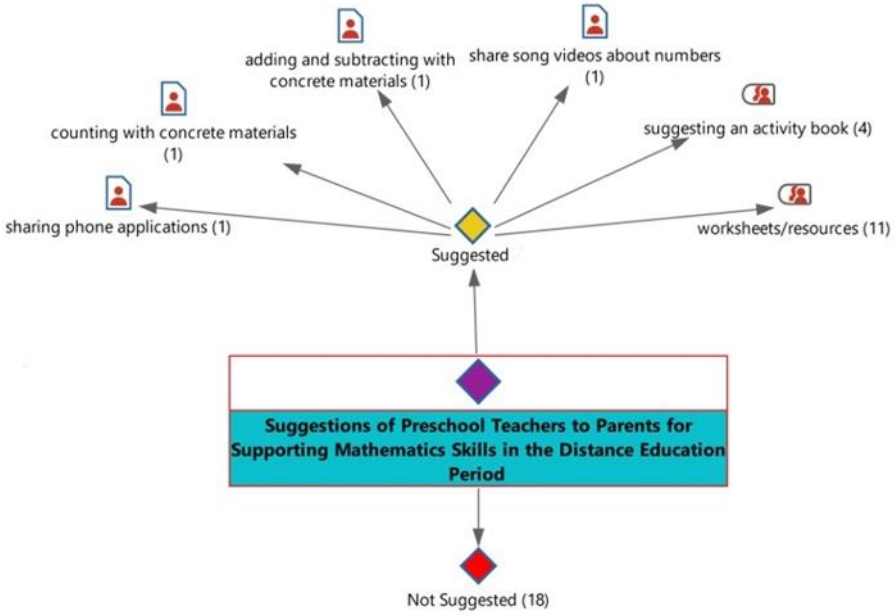


**Figure 9. Suggestions of preschool teachers to parents for supporting mathematics skills in the distance education period**

When Figure 9 is examined, the theme of teacher suggestions for supporting math skills is divided into categories as Suggested and Not Suggested. Suggested category was created from the

codes of sharing worksheets/resources, suggesting an activity book, song videos about numbers, adding and subtracting with concrete materials, counting with concrete materials, and sharing phone applications.

P19: *"Of course he suggested. We were doing live lessons in the evening, the teacher was asking, there was a wheel of fortune, for example, he was teaching a play like jumping on one foot 5 times. There were suggestions like giving us printouts and coloring six apples. We completed them."*

P28: "*The teacher did not provide any support. He finished his lesson and turned the computer off."*

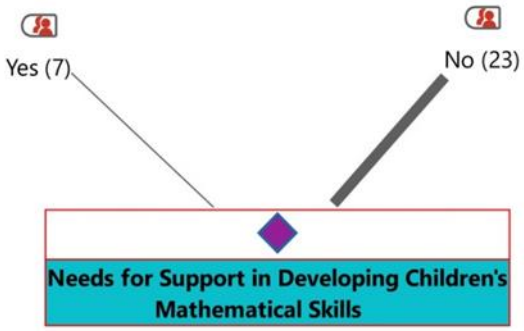


**Figure 10. Needs for support in developing mathematical skills**

P7: "*Of course it is possible. After all, no matter how much we know about that age group in educational sciences, I don't know as much as experts who deal with that age group. Of course, I think it would be much better if there was someone who directed me or told me to buy and use certain materials. I mean, I just tried to do as far as I know about educational sciences. I was reading about these things, but if an expert told me to do this directly, take this and apply this, it would be much better, and would be much more planned. So I would like that, yes."*



P30: *"Of course I needed support. Since I am in music education, I did not have a full grasp of what was going on in the preschool period. I had no idea what was taught. In fact, we do not know exactly what topics are in mathematics, how teaching should be, or what and how we will teach. Since the teacher did not inform us during this period, I tried to learn something by searching on the internet during this period."*

## 4. DISCUSSION and CONCLUSION

The study shows that parents knowledge about early mathematical skill include numbers, knowledge of operations, geometric shapes, the concept of greater / smaller, grasping, and clock. Similarly, in their study, Kılıç and Özcan (2020) found that parents did not mention the importance of matching, ordering, classification, and comparison skills among early mathematics skills. In their study, Thippana, Elliott, Gehman, Libertus, and Libertus (2020), who examined conversations of children including numbers with parents in math activities and non-math-related activities, reported that parents performed math-related activities with their children and they were more likely to use number words in math activities.

Parents consider matching, ordering, classification, and grouping skills, which are under the early mathematics skills, predominantly as daily life skills. Similarly, in their study, Kılıç and Özcan (2020), it was revealed that parents regard matching, sorting, classification, and grouping skills, which are under early mathematics skills, predominantly as daily life skills. Also, in the study of Öçal (2019),

parents emphasize that mathematics is important in children's daily lives. Within this respect, it can be concluded that parents are aware of the importance of mathematics in early childhood in children's development.

It was observed that children play with a variety of toys such as legos, dolls, character toys, box toys, kitchen toys, wooden toys, board games, puzzles, toy vehicles, and animals. It was determined that they made sequences with wooden toys and played board games that supported mathematical skills such as counting. The findings also indicated that they studied of numbers and math operations on the blackboard, which can be regarded as one of the non-toy materials children spend time with. Kitchen utensils and furniture at home are important elements that contribute to the development of children's early math skills (Blevins Knabe & Musun Miller, 1996). Kılıç and Özcan (2020) stated in their research that parents expressed that the materials they thought supported children's early math skills were puzzles, legos, and wooden toys. Majority of the parents stated that they do not think their home environment as a supportive element in the development of children's early math skills. In the study by Mutaf Yıldız, Sasanguie, De Smedt, and Reynvoet (2018), it was concluded that parents made more mathematical conversations when playing with lego and reading books than children, and children had more mathematical conversations while playing with lego compared to reading books. Within this respect, it can be concluded that children use mathematical expressions more in their daily activities.

The study concluded that most parents ignored mathematical speech in daily life. However, the findings highlighted that as a part of responsibilities parents gave to their children at home, they made mathematical conversations involving numbers and half/full concepts such as "Let's add 2 eggs, half a glass of flour, one package of oil" in the kitchen activities of counting and matching in preparing the table. Ergel and Aydoğan (2021) determined in their research that parents stated that children's early mathematical skills were supported by mathematical conversations in activities such as table preparation, cooking, laundry/dishwashing, cleaning, and shopping. Parents included mathematical conversations with children while playing games, shopping, and cooking with them, and these had positive effects on the development of children's mathematical skills (LeFevre et al., 2009; Ramani & Siegler, 2008).



It has been observed that almost half of the parents who make up the study group did not do activities related to mathematics with their children during the pandemic period, while the parents who did the activities mainly completed activities with their children in activity books, did addition-subtraction operations verbally or with concrete materials, and activities that support number/counting skills. Stites, Sonneschein, and Galczyk (2021) stated that parents provide inadequate amount of learning experiences in the field of mathematics to their children in the home environment. Similarly, Fatmawati, Herman, and Kisno (2021), in their research concluded that during the pandemic period, parents did not provide the necessary guidance to children in teaching mathematics activities, and they had difficulties in it. In the research conducted by Kılıç and Özcan (2020), parents stated that they think that numbers, addition and subtraction are used in preschool mathematics teaching. In other studies, creating opportunities to support mathematical skills through doing activities with children related to daily life, and creating mathematical conversations resulted in positive outcomes for children (Jay, Rose & Simmons, 2018; Sonnenschein et al., 2012). In the study conducted by Ergel and Aydoğan (2021), it was concluded that parents mostly played games to support children's early math skills, and then they did art activities and daily life-kitchen activities. In the study conducted by Zippert and Rittle Johnson (2020), it was seen that parents with children in the preschool period supported their children's arithmetic, spatial and pattern skills to a certain extent, and among these skills, they focused on supporting arithmetic skills the most.

Parents think that recognizing numbers, writing, and counting, especially addition and subtraction skillsshould be supported in the preschool period. Similarly, in his study Ocal (2019)

found that parents perceive early maths skills as numbers and operations. Ramani et al. (2015) found that children's basic knowledge of numbers has improved more than other maths skills because parents mostly study numbers at home. In their study, Blevins Knabe, Austin, Musun Miller, Eddy, and Jones (2000) concluded that mothers usually do activities at home with their children related to early math skills such as counting objects and talking about the order of events during the day.

It has been stated that more than half of the teachers of the children of the parents who constituted the study group did not make suggestions for activities during the pandemic period and that the teachers who made suggestions mostly shared worksheets/resources. In the research conducted by Karademir (2021), it was concluded that the parents with high socioeconomic status received support from the teachers during the pandemic period, but the families at the lower socioeconomic level could not communicate well with the teachers due to various reasons, thus causing the families to feel hopeless and anxious about the future of their children. On the other hand, Demir and Özdaş (2020) found that teachers were in contact with students and parents during the distance education period, they carried out distance education in cooperation with parents, and they conducted activities, gave assignments, and played games through various communication channels and follow-up the learning process. In addition, the problems related to communication such as the loss of communication of the teachers, the insensitivity of the parents, the inability to reach the parents, the inability to receive feedback from the given studies, and the inability to reach all students are the other results they obtained from the research. Preschool teachers should share more with parents about early math skills, and parents should be more open to learning at the point of gaining these skills.

Based on the findings obtained at the end of the study, the majority of parents did not need any support in developing their children's mathematical skills during the pandemic period. Similarly, Akkaya and Polat (2022), in a study examining the relationship between parents' math literacy self-efficacy and math anxiety, concluded that parents whose children are in the first grade of primary school have high math self-efficacy and do not need support. In the study by Cannon and Ginsburg (2008), parents state that it is not necessary for children to acquire mathematical skills in the preschool period. In addition, when the activities carried out by the parents were examined, it was determined that they spared little time for mathematics activities, and the activities they did were mostly activities related to the language development of the children. In his research, Panaoura (2021) determined that the competence of parents in doing activities with their children was low during the Covid-19 pandemic. Sonnenschein et al. (2012) concluded in their study that the reason why parents give less place to mathematics activities is that they have little knowledge to support their children's mathematics skills. Parents' comments on early math skills and skills that should be supported in the preschool period reveals that parents are not aware of their lack of knowledge. In the research by Ergel and Aydoğan (2021), parents indicated that they were aware of their responsibilities in helping children acquire mathematical skills, but their current knowledge was insufficient in terms of teaching mathematical skills and therefore they need support. In their study, Ölmez, Özkan, Bilgin, and Veziroğlu Çelik (2019), who studied parents whose children received preschool education, concluded that although parents consider it important to provide early mathematics education, their knowledge level about the content of early mathematics education was not sufficient. Haktanır (2021) examined the level of support parents gave for mathematics and literacy preparation skills at home and found that parents supported these activities at a moderate level. It is important that parents who have children in the preschool period are provided with a supportive training on early mathematics skills and how these skills can be taught to children as early as possible.

Parents' participation in children's learning processes not only increases academic achievement, but also positively affects processes such as behavioral development and social adaptation (Sapurgan & Sapurgan, 2014). In this direction:

- Training programs on early mathematics skills and methods for teaching these skills can be organized for parents.
- An educational program for developing parents' skills of teaching early mathematics skills to their children can be developed and the effectiveness of this program can be evaluated.
- Policy makers can provide training to families on early mathematics skills.
- With education systems such as EBA, a platform can be created that includes suggestions for activities and materials that parents can do at home regarding mathematics in early childhood.

*Limitations*

The study group is limited to 30 parents whose children aged between 3 and 6 attended preschool education during the pandemic period.

*Ethics Committee Decision*

*The study, the researchers applied for ethical permission from Sivas Cumhuriyet University Scientific Research and Publication Ethics Social and Human Sciences Board, and an ethical approval was received (E-60263016-050.06.04-91547).*

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**Appendix. Research process (PRISMA)**