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# An Analysis of the Views of Parents with Preschool Children in Relation to Science and Preschool Science Activities

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## Abstract

Although much is known about children and teachers' attitudes towards science and science activities, considerably less is known about what parents believe about them. Parents' attitudes towards science and science activities are as important as teachers' role in influencing children‟s achievement in science. In this study, parents‟ views towards science and preschool science activities were investigated as to different variables. In this regard, descriptive research method was used in the study, which was conducted with 442 mothers (383) and fathers (59) with children aged between 3 and 6 years and attending preschool. „The Parents' Views about Science and Preschool Science Activities Scale (PaVSPeSAS)‟ developed by Sahin, Uludağ, Gedikli, and Karakaya (2018) demographic information form developed by the researcher was used as the data collection tools in the study. Since the data were collected during the COVID-19 pandemic process, they were obtained by sharing with parents the scale link prepared on the online platform. The results showed that parents‟ gender, age, educational background, the amount of time spent with children for kitchen activities have impacts on parents‟ different views regarding science content.

## Introduction

Science education at an early age supports the language development, early literacy, and math skills of young children, as well as improving their understanding of science concepts (Gerde, Schachter & Wasik, 2013; Simsar, 2018). Researchers have summarized the reasons for the necessity of providing science education at an early age under six headings: (a) having fun in nature, (b) developing positive attitudes towards science, (c) understanding scientific concepts, (d) early acquisition of scientific terms, (e) developing scientific understanding and reasoning skills, and (f) developing scientific thinking (Eshach & Fried, 2005). Since these skills can be acquired through a good science education to be provided both in school and out-of-school settings, teachers and parents both have significant responsibilities. Yet, research show that preschool teachers do not spend much time on science activities as they feel inadequate about science and science teaching (Greenfield et al., 2009; Tu, 2006; Saçkes et al. 2011; Simsar, 2018), nor is there enough number of studies about parents‟ attitudes towards science education at an early age and its positive impact on children‟s academic achievement (Adair, 2020).

In recent years, a new perspective has emerged on preschool science education. Relevant studies have revealed that the difference among children's achievement in science education begins in early childhood (Curran & Kellogg, 2016; Morgan et al., 2016). However, given the studies on the early childhood science education and academic achievement of preschool children in science education, it is apparent that most of such studies consisted of teachers and children, and very few of them were about parents (Adair, 2020; Aktamış, 2017; Çetin & Ata, 2020; Morgan et al., 2016; Simsar, 2018; van Aalderen-Smeets et al., 2012). Therefore, while more emphasis has been placed on preschool teachers' attitudes towards science and their effects on students‟ science achievement, preschool parents' attitudes towards science and the effects of such attitudes on children have not yet been clarified (Adair, 2020). Consequently, the need has arisen for studies on the influence of parents on children's science achievement. Also, it is necessary to examine parents‟ attitudes towards science, and how the science activities and practices that they perform with their children may subsequently influence their children's science learning and achievement. A recent study by Morgan, Farkas, Hillemeier, and Maczuga (2016) has indicated that the gap in science achievement for most children starts even before kindergarten. The main reason for this is believed to be related to whether or not parents support their children. Similarly, Carter (2003) stated that parents play an essential role in the education of their children, just like PTA (2009) emphasizing that parents are the most important teachers that children may have throughout their lives, both demonstrating how essential parents are for their children to acquire the above-mentioned science-related skills.

Many studies investigating the impact of parents on children's early academic development have revealed that parents‟ participation in preschool education (Ishak, Low, & Lau 2012; Ingram, Wolfe, & Lieberman 2007; Hill & Tyson 2009; Ray & Smith 2010), their expectations from the education that their children receive (Kreider et al. 2007), their socioeconomic levels (Schlee, Mullis, & Shriner, 2009), and their educational background (McMullen 2005; Kotaman 2008; Polat 2008) have a significant impact on their children‟s early academic achievement. Besides, Ogunkola and Olatoye (2010) stated that variables such as parents‟ gender, age, and family type are also influential on children‟s early academic success.

The National Science Teachers Association (NSTA) (NSTA, 2009) stated that parents have a very important role in the development of science skills and success in science education in children. From the moment children are born, they begin to explore their environment and the world through intrinsic curiosity. In the first years of their lives, they ask a lot of questions trying to learn the issues and concepts they are curious about. At this stage, parents should encourage their children‟s curiosity, explain to them what they are capable of doing, and create settings that motivate the child to explore independently (NSTA, 2009). Similarly, Falk, Storksdieck, and Dierking (2007) reported that parents have a very critical role in children‟s achievement in science and acquisition of science concepts in schools and that children‟s academic achievement in science may increase with non-formal experiences in out-of-school settings. As an example, extracurricular activities organized by parents to spend time with their children, such as watching animal documentaries and talking about them, doing cooking activities (such as making yoghurt, cooking, making dough, making pastries, etc.), visiting the zoo, or taking aquarium trips and nature walks can support children‟s ability to understand science concepts in different fields (Sun et al., 2012).

A study conducted on parents‟ attitudes towards science and science education revealed that variables such as the number of science-related books and encyclopedias, and the amount of computer use were related to parents‟ positive attitudes towards science (George & Kaplan, 1998). Likewise, visits to out-of-school settings and domestic activities that parents do with their children can also demonstrate their positive attitudes towards science (Sun et al., 2012; Szechter & Carey, 2009; Tare et al., 2011). In this respect, Szechter and Carey (2009) pointed out the importance of extracurricular activities in parents‟ attitudes towards science, just like Ho (2010) stating that watching television programs about science at home or reading science-related books is also related to such positive attitudes. In another study, Kaya and Lundeen (2010) reported that parents who have a negative attitude towards science education at school are not involved in helping their children with science homework at home. In another recent study, Rice et al. (2012) indicated that parents‟ participation in science activities offered at schools besides their perception of science and self-efficacy beliefs would increase their children‟s participation in science-related activities. Similarly, Perera, Bomhoff, and Lee (2014) stressed that parents‟ attitudes towards science have positive effects on children's science academic achievement. However, in a qualitative study of parents‟ attitudes towards science, Barton et al. (2001) investigated urban mothers‟ perspectives on science. The researchers worked with 24 mothers and concluded that the majority of mothers had a positive attitude towards science in matters such as nourishment and cooking with children. Similarly, a study focusing on parents‟ attitudes towards science in terms of gender (Silander et al., 2018) indicated that mothers are less able to support their children in science at home than fathers. This is believed to be due to the fact that mothers spend more time with the housework.

The studies mentioned above have revealed that parents have a significant influence on their children‟s attitudes towards science and science education and that different variables are influential on such attitudes. The aim of this study is to examine the opinions of parents with children at preschool about science and science activities in early childhood in relation to different variables. In this regard, the study's research question was determined as: „What are the variables that affect the views of parents with preschool children about science and science activities in early childhood?‟

## Method

### Research Design

The aim of this study is to examine the opinions of parents with preschool children about science and science activities in early childhood as to different variables. In this context, the study employed the descriptive research method and the survey model, in which the views of parents related to science and science activities in early childhood education were revealed through a questionnaire. In descriptive research, the aim is to examine a phenomenon by considering its existing conditions. Frankel and Wallen (2006) emphasized that descriptive studies should focus on how a particular phenomenon varies among participants individually, rather than exploring their individual opinions about the phenomenon. In the current study, parents' opinions about science education were examined with respect to different variables, and their opinions towards science were examined as to different subdimensions.

**Study Group**

The study was conducted with 442 mothers and fathers with children between the ages of 3-6 years, receiving early childhood education. Table 1 presents the results regarding the demographic information of the participants.

Table 1. Demographic Information of the Participants

| **Category** | **Value** | **n** | **%** |
|---|---|---|---|
| Child" Gender | Girl | 206 | 46.6 |
| | Boy | 236 | 53.4 |
| Child" Age | 3-4 years | 153 | 34.6 |
| | 5-6 years | 289 | 65.4 |
| Parents" Gender | Mother | 383 | 86.7 |
| | Father | 59 | 13.3 |
| Parents" Age | 25 years and under | 23 | 5.2 |
| | 26-30 | 153 | 34.6 |
| | 31-36 | 185 | 41.9 |
| | 37-42 | 68 | 15.4 |
| | 43 and above | 13 | 2.9 |
| Parent Education Status | Primary School | 111 | 25.1 |
| | High School | 106 | 24.0 |
| | Undergraduate | 193 | 43.7 |
| | Graduate and above | 32 | 7.2 |
| Parental Occupational Status | Housewife/Not working | 260 | 58.8 |
| | Worker | 11 | 2.5 |
| | Self-employment | 11 | 2.5 |
| | Officer | 46 | 10.4 |
| | Teacher | 73 | 16.5 |
| | Other | 41 | 9.3 |
| Adequate science education at school | Yes | 203 | 45.9 |
| | No | 239 | 54.1 |
| Getting teacher support for science education | Yes | 264 | 59.7 |
| | No | 178 | 40.3 |
| Time spent with the children at home | 1-3 hours | 67 | 15.2 |
| | 4-7 hours | 133 | 30.1 |
| | 8-12 hours | 115 | 26.0 |
| | 13 hours and above | 127 | 28.7 |
| Doing Kitchen and gardening activities with the child at home | Never | 10 | 2.3 |
| | Rarely | 38 | 8.6 |
| | Sometimes | 173 | 39.1 |
| | Most of the time | 170 | 38.5 |
| | Always | 51 | 11.5 |

The majority of the parents participating in the study were mothers (86.7%), aged between 31-36 years (41.9), and most of whom were either unemployed or housewives (58.8%). Additionally, the majority of the participants believed that the science education that their children receive at school is not sufficient (54.1%) and stated that teachers support parents in doing science activities with children at home (59.7%). Again, the majority of the participants stated that they spend time in the kitchen with their children, which may lead to the assumption that they spend enough time with their children depending on their professional status.

**Data Collection Tool**

The data collection tools in this study are „The Parents' Views about Science and Preschool Science Activities Scale (PaVSPeSAS)" developed by Sahin, Uludağ, Gedikli, and Karakaya (2018) and the demographic information form developed by the researcher.

*The Parent's Views about Science and Preschool Science Activities Scale*

The PaVSPeSAS scale, developed by Şahin et al. (2018), consists of 50 items and five (5) different subdimensions. The reliability coefficient of the scale's factors varies between .734 and .913, while the overall reliability coefficient of the scale appears to have a high value of .93. Tosun and Taskesenligil (2011) indicated that a reliability coefficient of .70 or higher is considered a reliable value for using the scale in social sciences.
There are five (5) subdimensions in the scale, namely, "General views on science and preschool science activities," "Views on 'Life Sciences' activities in the preschool period," "Views on 'Physical Sciences' activities in the preschool period," "Views on Earth and Space Sciences' activities in the preschool period," and lastly, "Views on science activities at preschool":

1) The dimension of general views on science and preschool science activities (GV) consisted of 16 statements in total, with the Cronbach"s alpha value indicated as .81. In this dimension, there are general statements about science activities applied in the preschool period, for example, "I encourage my child to ask questions about science."

2) The dimension of views on 'Life Sciences' (LS) activities in the preschool period consisted of 14 statements in total, with the Cronbach"s alpha value indicated as .78. In this dimension, there are statements about the concepts of plants, animals, and humans in life sciences, for example, "I chat with my child about the characteristics and life cycles of animals."

3) The dimension of views on 'Physical Sciences' (PS) activities in the preschool period consisted of 7 statements in total, with the Cronbach"s alpha value indicated as .83. In this dimension, there are statements about the concepts in physical science, for example, "I let my child disassemble and examine old electronic appliances in the house."

4) The dimension of views on the activities of „Earth and Space Sciences" (ESS) in the preschool period consisted of 6 statements in total, with the Cronbach"s alpha value indicated as .71. In this dimension, there are statements about the concepts in earth and space sciences, for example, "We observe the movement of the sun with my child and chat about our observation."

5) The dimension of views on science activities at school (SAS) consisted of 7 statements in total, with

the Cronbach‟s alpha value indicated as .71. In this dimension, there are statements about science activities at school and the relevant views of parents, for example, "I would like to participate in science activities at school."

*Demographic Information Form*

The demographic information form developed by the researcher consists of 16 questions in which there are multiple-choice questions. This section contains demographic information such as parents‟ age, gender, educational background, and the amount of time spent with children.

*Data Collection Process*

The research started on March 15, 2020 and ended on April 15, 2020. As the study collected data during the COVID-19 pandemic, the scale was prepared on the online platform and shared with parents. In sharing the link, not only parents but also teachers working in different preschool institutions supported the process. While preschool teachers shared the link in parents‟ groups, it was aimed to access parents of different socioeconomic levels by sharing the link with other parents in the class where their children attended, as well as friends or relatives.

**Data Analysis**

The data obtained in the study were transferred to the electronic environment, and descriptive analyses were made by means of the SPSS program to determine the scores of the parents‟ views on science education. Next, t-test and one-way ANOVA analyses were performed in order to determine the statistical significance levels between these scores and some variables for parents, and the results were presented in tables.

## Results

The aim of this study is to reveal the opinions of parents with preschool children about science and science activities. To this end, a descriptive analysis of the parents' scores for their responses to the PaVSPeSAS scale was made in different subdimensions and the results are given in Table 2.

Table 2. Descriptive Values of Scores Obtained from PaVSPeSAS Scale

| PAVSPESAS Sub-Dimensions | n | Min. | Max. | Mean | *SD* |
|---|---|---|---|---|---|
| GV | 442 | 16.00 | 80.00 | 56.40 | 7.93 |
| LS | 442 | 25.00 | 70.00 | 54.25 | 7.67 |
| PS | 442 | 7.00 | 35.00 | 25.11 | 4.35 |
| ESS | 442 | 6.00 | 30.00 | 23.14 | 4.02 |
| SAS | 442 | 11.00 | 35.00 | 26.54 | 3.18 |

Table 3 presents the t-test findings regarding whether the parents' scores in relation to their views on science and science activities show statistical significance as to gender.

Table 3. Comparison of Values Obtained from PaVSPeSAS scale by Parents‟ Gender

| Sub-Dimensions | Parents‟ Gender | n | Mean | *SD* | *t* | *p* |
|---|---|---|---|---|---|---|
| GV | Mother | 383 | 56.55 | 7.83 | 1.051 | .29 |
| | Father | 59 | 55.38 | 8.55 | | |
| LS | Mother | 383 | 54.54 | 7.48 | 2.066 | .04* |
| | Father | 59 | 52.33 | 8.63 | | |
| PS | Mother | 383 | 25.00 | 4.25 | -1.416 | .15 |
| | Father | 59 | 25.86 | 4.93 | | |
| ESS | Mother | 383 | 23.23 | 3.97 | 1.296 | .19 |
| | Father | 59 | 22.50 | 4.33 | | |
| SAS | Mother | 383 | 26.53 | 3.12 | -.206 | .83 |
| | Father | 59 | 26.62 | 3.58 | | |

**Significant level at .05.*

Considering the results given in Table 3, it is obvious that the statistical significance between the scores of the mothers' and fathers‟ opinions about science is only in the Life Sciences dimension (t= 2.066, sd= 440, p< .05). Examined in detail, the scores of the mothers and fathers‟ views on science activities are close to each in some other fields, yet with no statistical significance. Table 4 presents the ANOVA test results regarding whether the parents‟ views on science and preschool science activities differ significantly according to their educational background.

Table 4. Comparison of the Scores based on Education Status

| Sub-level | Variables | n | Mean | *SD* | F | *p* |
|---|---|---|---|---|---|---|
| GV | Primary School | 111 | 55.96 | 9.41 | 1.34 | .26 |
| | High School | 106 | 56.65 | 7.24 | | |
| | Undergraduate | 193 | 56.91 | 7.41 | | |
| | Graduate and above | 32 | 54.06 | 7.42 | | |
| LS | Primary School | 111 | 51.72 | 7.99 | 7.53 | .00* |
| | High School | 106 | 53.66 | 7.43 | | |
| | Undergraduate | 193 | 55.79 | 7.43 | | |
| | Graduate and above | 32 | 55.75 | 6.47 | | |
| PS | Primary School | 111 | 23.70 | 4.47 | 6.6 | .00* |
| | High School | 106 | 24.98 | 3.78 | | |
| | Undergraduate | 193 | 25.80 | 4.38 | | |
| | Graduate and above | 32 | 26.38 | 4.51 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ESS | Primary School | 111 | 21.82 | 4.67 | 9.29 | .00* |
| | High School | 106 | 22.58 | 3.84 | | |
| | Undergraduate | 193 | 24.16 | 3.54 | | |
| | Graduate and above | 32 | 23.44 | 3.47 | | |
| SAS | Primary School | 111 | 25.37 | 3.39 | 8.43 | .00* |
| | High School | 106 | 26.45 | 3.09 | | |
| | Undergraduate | 193 | 27.21 | 2.88 | | |
| | Graduate and above | 32 | 26.97 | 3.50 | | |

**Significant level at .05.*

As can be seen in Table 4, when the ANOVA results were examined for each dimension in the PaVSPeSAS scale by the type of parents‟ educational background, statistical significance was observed in the dimensions of life sciences F (LS) (4.437 = 7.53, p <.05), physical science F(PS) (4.437). = 6.63, p <.05), earth and space sciences F(ESS) (4.437 = 9.29, p<.05), and in science activities at school F(SAS) (4.437 = 8.43, p<.05), while there is no statistical significance in the dimension of general views on science and preschool science activities F(GV) (4.437 = 1.34, p<.05). Accordingly, it was found that the parents‟ educational background was significantly related to many dimensions in the scale but did not create significance on their general views on science and preschool science activities. Table 5 presents the ANOVA test results regarding whether the parents‟ views on science and preschool science activities differ significantly as to their professions.

Table 5. Comparison of the Scores based on Parents‟ Occupational Status

| Sub-level | Variables | n | Mean | *SD* | F | *p* |
|---|---|---|---|---|---|---|
| GV | Housewife/Not working | 260 | 56.80 | 7.61 | 2.34 | .04* |
| | Worker | 11 | 53.18 | 10.64 | | |
| | Self-employment | 11 | 51.09 | 14.31 | | |
| | Officer | 46 | 54.59 | 6.62 | | |
| | Teacher | 73 | 57.60 | 7.87 | | |
| | Other | 41 | 56.05 | 7.78 | | |
| LS | Housewife/Not working | 260 | 53.85 | 7.40 | 4.53 | .00* |
| | Worker | 11 | 50.27 | 13.33 | | |
| | Self-employment | 11 | 52.27 | 10.09 | | |
| | Officer | 46 | 52.72 | 7.50 | | |
| | Teacher | 73 | 57.78 | 6.64 | | |
| | Other | 41 | 53.83 | 7.12 | | |
| PS | Housewife/Not working | 260 | 24.62 | 4.12 | 3.51 | .00* |
| | Worker | 11 | 24.55 | 5.61 | | |
| | Self-employment | 11 | 24.27 | 7.10 | | |
| | Officer | 46 | 25.50 | 4.57 | | |
| | Teacher | 73 | 26.93 | 3.79 | | |
| | Other | 41 | 25.02 | 4.61 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ESS | Housewife/Not working | 260 | 22.87 | 4.10 | 3.29 | .00* |
| | Worker | 11 | 22.00 | 5.73 | | |
| | Self-employment | 11 | 21.91 | 6.70 | | |
| | Officer | 46 | 22.67 | 3.69 | | |
| | Teacher | 73 | 24.79 | 2.99 | | |
| | Other | 41 | 23.07 | 3.54 | | |
| SAS | Housewife/Not working | 260 | 26.20 | 3.10 | 3.81 | .02* |
| | Worker | 11 | 24.73 | 3.95 | | |
| | Self-employment | 11 | 27.36 | 6.30 | | |
| | Officer | 46 | 27.07 | 2.99 | | |
| | Teacher | 73 | 27.71 | 2.78 | | |
| | Other | 41 | 26.34 | 2.72 | | |

**Significant level at .05.*

In Table 5, when ANOVA results were analyzed for each dimension in the PaVSPeSAS scale as to parents‟ profession, a statistically significant difference was found in the general views on science and preschool science activities F(GV) (4.437 = 2.34, p<.05), the life sciences dimension F(LS) (4.437 = 4.53, p<.05), the physical science dimension F(PS) (4.437 = 3.51, p<.05), the earth and space sciences dimension F(ESS) (4.437 = 3.29, p<.05), and the dimension of science activities at school F(SAS) (4.437 = 3.81, p<.05). Thus, parents‟ professions were an essential variable in their views about science and preschool science activities.

Table 6 presents the ANOVA test results regarding whether the parents‟ views on science and preschool science activities show a statistical significance as to their age.

Table 6. Comparison of the Scores based on Parents‟ Age

| Sub-level | Variables | n | Mean | *SD* | F | *p* |
|---|---|---|---|---|---|---|
| GV | 25 years and under | 23 | 56.09 | 7.51 | .30 | .87 |
| | 26-30 | 153 | 56.37 | 6.82 | | |
| | 31-36 | 185 | 56.52 | 8.30 | | |
| | 37-42 | 68 | 55.85 | 9.55 | | |
| | 43 and above | 13 | 58.38 | 6.87 | | |
| LS | 25 years and under | 23 | 51.09 | 8.28 | 1.73 | .14 |
| | 26-30 | 153 | 54.30 | 7.23 | | |
| | 31-36 | 185 | 54.90 | 7.64 | | |
| | 37-42 | 68 | 53.21 | 8.45 | | |
| | 43 and above | 13 | 55.62 | 6.98 | | |
| PS | 25 years and under | 23 | 23.87 | 5.11 | 2.57 | .03* |
| | 26-30 | 153 | 24.85 | 4.28 | | |
| | 31-36 | 185 | 25.63 | 3.87 | | |
| | 37-42 | 68 | 24.35 | 5.36 | | |
| | 43 and above | 13 | 27.23 | 3.44 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 25 years and under | 23 | 20.96 | 4.94 | 2.50 | .04* |
| | 26-30 | 153 | 23.09 | 3.88 | | |
| ESS | 31-36 | 185 | 23.48 | 3.77 | | |
| | 37-42 | 68 | 22.82 | 4.72 | | |
| | 43 and above | 13 | 24.46 | 2.22 | | |
| | 25 years and under | 23 | 25.83 | 4.17 | .73 | .56 |
| | 26-30 | 153 | 26.70 | 2.98 | | |
| SAS | 31-36 | 185 | 26.68 | 2.98 | | |
| | 37-42 | 68 | 26.16 | 3.76 | | |
| | 43 and above | 13 | 26.23 | 3.32 | | |

**Significant level at .05.*

As seen in Table 6, the parents' different age range demonstrated no statistical significance in the ANOVA analysis results for each dimension in the PaVSPeSAS scale in relation to the general views on science and preschool science activities F(GV) (4.437 = .30, p>.05), life sciences F(LS) (4.437 = 1.73, p>.05), and science activities in school F(SAS) (4.437 = 7.73, p <.05). However, a statistical significance was found as to parents‟ age in the subdimensions of views on physical science F(PS) (4.437 = 2.57, p<.05) and earth and space sciences F(ESS) (4.437 = 2.50, p<.05). In this case, it can be assumed that age is significantly related to the parents‟ views‟ in different dimensions pertaining to science. Table 7 presents the ANOVA test analysis results regarding whether there is a significant difference between the frequency of the kitchen and garden activities that the parents have done at home with their children and the scores of their opinions on science and science activities.

Table 7. Comparison of the Scores based on the frequency of activities in Kitchen and Gardening

| Sub-level | Variables | n | Mean | *SD* | F | *p* |
|---|---|---|---|---|---|---|
| | Never | 10 | 48.80 | 10.29 | 4.74 | .01* |
| | Rarely | 38 | 54.63 | 8.64 | | |
| GV | Sometimes | 173 | 56.34 | 6.56 | | |
| | Most of the time | 170 | 56.41 | 7.73 | | |
| | Always | 51 | 59.39 | 10.39 | | |
| | Never | 10 | 39.50 | 9.14 | 22.01 | .00* |
| | Rarely | 38 | 50.66 | 6.85 | | |
| LS | Sometimes | 173 | 53.04 | 6.77 | | |
| | Most of the time | 170 | 55.82 | 6.61 | | |
| | Always | 51 | 58.73 | 8.80 | | |
| | Never | 10 | 22.30 | 4.74 | 4.80 | .01* |
| | Rarely | 38 | 23.66 | 4.66 | | |
| PS | Sometimes | 173 | 24.73 | 3.81 | | |
| | Most of the time | 170 | 25.50 | 4.18 | | |
| | Always | 51 | 26.78 | 5.60 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Never | 10 | 18.10 | 5.26 | 10.18 | .00* |
| | Rarely | 38 | 21.11 | 4.26 | | |
| ESS | Sometimes | 173 | 22.92 | 3.52 | | |
| | Most of the time | 170 | 23.59 | 3.84 | | |
| | Always | 51 | 24.88 | 4.46 | | |
| | Never | 10 | 24.80 | 3.43 | 7.57 | .00* |
| | Rarely | 38 | 26.24 | 3.39 | | |
| SAS | Sometimes | 173 | 25.79 | 2.80 | | |
| | Most of the time | 170 | 27.05 | 2.99 | | |
| | Always | 51 | 28.04 | 3.97 | | |

**Significant level at .05.*

As seen in Table 7, when the ANOVA results were analysed according to the frequency of the time that parents spend with their children in the kitchen and garden for each dimension included in the PaVSPeSAS scale, a significant difference was observed in all dimensions, namely, F(GV) (4.437 = 4.74, p<.05), F(LS) (4.437 = 22.01, p<.05), F(PS) (4.437 = 4.80, p<.05), F(ESS) (4.437 = 10.18, p<.05), and F(SAS) (4.437 = 7.57, p<.05). Accordingly, it was found that the time spent by the parents with their children in the kitchen and in the garden was significantly related to their attitudes on science and preschool science activities.

## Discussion

This study presents the opinions of parents with preschool children about science and preschool science activities. As a matter of fact, parents‟ opinions about science and science activities play an essential role in the science achievement of children in the future (Adair, 2020). The results in this study have shown that the parents‟ views on science depend on different variables.

It is a known fact that mothers are most effective in educating children in early childhood in Turkey (ACEV, 2017). While mothers participate more in school activities, fathers spend time with their children at home activities. Rice et al. (2012) stated that parents who participate in science activities at schools gain a positive attitude towards science. In Turkey, mothers, in particular, are expected to hold science in higher esteem compared to fathers. While Silander et al. (2018) recently stated that fathers support their children more at home in science, an earlier study conducted with mothers revealed that mothers spent more time on kitchen activities such as nourishment and cooking with their daughters (Barton et al., 2001). In this study, parents‟ views on science and preschool science activities as to gender were investigated and no statistically significant difference was found in the scores between parents. The analysis of the t-test results showed that mothers‟ views on science differed significantly from fathers‟ pertaining to life sciences, which is believed to be related to the concepts in life sciences. For example, in terms of topics included under life sciences, such as chatting about animals, plants, and people, growing plants at home, and visiting zoos and botanical gardens, it is believed that mothers‟ relevant views may have evolved in time due to the fact that fathers generally work, but mothers do not and are usually housewives, thereby spending more time with their children.

One of the critical findings in this study is that there are significant differences between parents‟ educational background and their views on science and science activities in the preschool period. As the education levels of the parents increased, their scores on their views in relation to life sciences, physical science, earth and space sciences, and science activities in schools were found to increase in a statistically significant manner. In the relevant literature, it is not surprising to find out that parents with a high level of education can provide more support to their children in science (McMullen 2005; Kotaman 2008; Polat 2008; Silander et al., 2018). It has been stated that parents feel more competent in science subjects due to their high level of education and have a more positive attitude towards science due to their high self-efficacy in their capacity to support their children sufficiently in this regard (Silander et al., 2018). Similarly, Adair (2020) stated in a study about parents‟ attitudes towards science education that parents feel more competent in science depending on their education level and hence show a more positive attitude towards science.

Another important finding is the significant relationship between parents‟ professions and their views on science activities in different fields and science activities at school. Falk et al. (2007) noted that children could also achieve acquisitions towards science and science concepts outside of school. In order for children to spend time outside of school, parents should spare enough time for their children and be knowledgeable about science activities. The demographic status of the parents who participated in our study revealed that the parents spent enough time with their children. Also, the parents reported that they received support from their children‟s teachers so that they could do science activities with their children. Sun et al. (2012) pointed out that parents can support their children on science concepts in different fields with activities such as visiting zoos or aquariums and taking trips to nature with their children. In addition, a previous study reported that parents‟ ability to use computers (George & Kaplan, 1998), watching television programs about science, and reading books with children (Ho, 2010) are also related to parents‟ positive attitude towards science. Similar to this study, the socioeconomic status of the parents, depending on their occupations, was found influential on parents‟ positive attitude towards science (Hacieminoglu, 2015, Saçkes, 2014). Another reason why the professional status is considered to have an influence on parents‟ views on science and preschool science activities is that people working in science-related fields are believed to earn more. The parents may have thought this way, considering the possibility that the majority of the participants are not working / housewives and their socioeconomic status may be at a middle or lower level. That could be the main reason for correlation between parents‟ profession and their thoughts about science.

This study showed that age has an impact on different science fields (physical science and Earth and Space sciences) in such a way that positive attitudes increased in such fields with increasing age. Similarly, a number of studies have demonstrated that the age of parents is important in supporting children's academic success (Abdullahi, Mlozi, & Nzalayaimisi, 2015; Ogunkola & Olatoye, 2010). Abdullahi et al. (2015), in a study with Nigerian parents, stated that the age of the parents had a negative effect on supporting their children. The researchers stated that as the age of the parents decreased, the academic support they gave to their children increased. In this study, on the contrary, it was determined that parents with preschool children support their children more in the field of earth and space sciences and physical science as their age increases.

Finally, a significant relationship was observed between the frequency of activities that parents can do at home with their children such as kitchen activities and plant growing, and their perspectives on science and preschool science education. This has once again demonstrated the importance of home-based activities for parents‟ participation in the preschool period (Ishak, Low, & Lau 2012; Ingram, Wolfe, & Lieberman 2007; Hill &Tyson 2009; Ray & Smith 2010). While Sun et al (2012) emphasized the importance of the time that parents spend with their children out of school and home, the present study stressed the importance of activities that can be done at home. In this sense, Ho (2010) drew attention to the positive effect of the variety of the activities that can be done at home on the academic achievement of children, by emphasizing the importance of watching television programs and reading books about science with their children.

## Conclusion

In conclusion, this study observed a relationship between the parents‟ gender, age, professional status, educational background, and the science-related home activities, and the parents‟ perceptions of science and preschool science activities. Also, some variables indicated a specific relationship between parents and different science fields, but some did not, which can actually be associated with the demographic distribution of the sample group. It is also believed that the collection of data during the pandemic may have influenced the parents‟ views on science and preschool science activities since many parents had the opportunity to spend more time at home with their children, depending on whether they were working from home or became unemployed. Consequently, parents may have had the opportunity to realize the importance of preschool science education based on teachers‟ guidance for science activities at home and research activities on their children‟s science academic achievement. Thus, it was found that different variables are influential on parents‟ perspectives about science.

## Recommendations

A number of recommendations can be given to both preschool teachers and parents with preschool children as well as researchers in line with the findings of this study. First, it seems important for teachers to support families in doing science activities at home. In this regard, teachers can offer suggestions for families to do science activities with their children outside of school, and can prepare brochures and organize trips to different out-of-school settings to increase parents‟ interest in science. Second, depending on the amount of time parents spend with their children at home as well as on the size and availability of the house, they can perform activities such as kitchen activities, growing flowers in pots, growing fish, painting, and doing simple experiments at home. In this regard, they can consult preschool teachers when needed, or relevant websites on the internet can be used. Finally, when it comes to researchers who will conduct studies on parents, it has been observed that there are not enough studies for parents on preschool science activities. As a survey, this study revealed that there are relationships between different demographic information of parents and their views on science and preschool science activities. Moreover, significant differences were detected between the views of mothers and fathers. In the future, an applied study for parents can be designed to observe the changes in parents‟ views on science activities in preschool, and their on science can also be examined in more depth by conducting a case

study with parents from different socioeconomic backgrounds.

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