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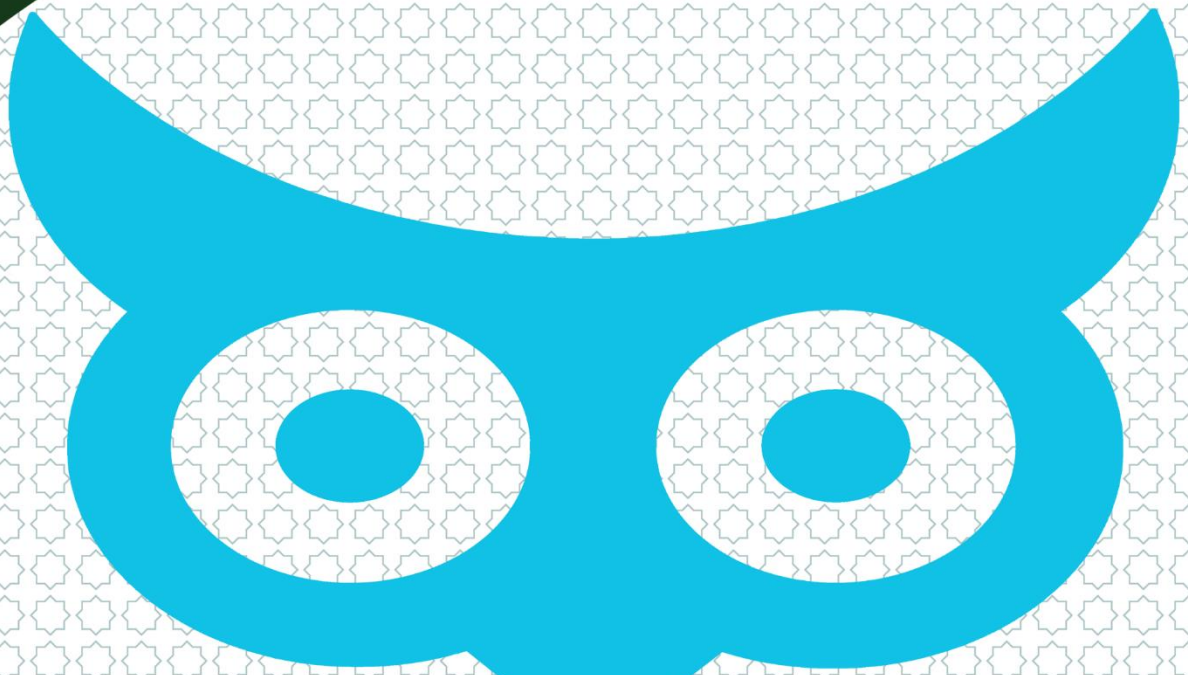

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Investigation of Family Involvement in Preschool Period

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ABSTRACT

The aim of this study is to determine the demographic variables that impact on family involvement during the preschool period. The sample consisted of 137 parents with children between the ages of 2-6, currently enrolled in preschool education. The parents' demographic characteristics varied in terms of age, gender, socio-economic status and level of education. The analysis revealed a significant difference in family involvement scores between mothers and fathers across all three sub-dimensions, with mothers obtaining higher scores. A negative correlation was found between the age of first-time parenthood and family involvement. Additionally, home-based participation decreased with increasing parental age, and increased with higher SES. However, no significant difference in family involvement was observed based on parental education.

ÖZ

Bu araştırmanın amacı, okul öncesi dönemde aile katılımı üzerinde etkisi olan demografik değişkenleri belirlemektir. Araştırmanın örneklemi, 2-6 yaş arası okul öncesi eğitim almakta olan çocuğa sahip 137 ebeveynden oluşmaktadır. Ebeveynlerin demografik özellikleri yaş, cinsiyet, sosyoekonomik durum ve eğitim düzeyine göre farklılık göstermektedir. Yapılan analizler sonucunda anne ve babaların aile katılım puanları arasında her üç alt boyutta da anlamlı bir fark olduğu ve annelerin puanlarının daha yüksek olduğu belirlenmiştir. İlk kez ebeveyn olma yaşı ile aile katılımı arasında negatif bir ilişki tespit edilmiştir. Bunun yanı sıra ebeveyn yaşı arttıkça ev temelli katılım düzeyinin azaldığı, sosyoekonomik düzey yükseldikçe ise arttığı görülmüştür. Aile katılım düzeyinde ebeveyn eğitim seviyesine bağlı olarak anlamlı bir fark tespit edilmemiştir.

Keywords:
Family Involvement, Preschool Education, Parents.

Anahtar Kelimeler:
Aile Katılımı, Okul Öncesi Eğitim, Ebeveyn.

Introduction

Child development encompasses the growth and development of individuals, including physical, cognitive, emotional, and social transformations that occur from infancy to adolescence (Levin, 2011). There are various factors that affect the developmental processes of children. Environment can be accepted as one of the most effective

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components in this process. As stated by Bronfenbrenner, the development of an individual is shaped by the ongoing interplay between the individual and their surrounding environment (Bronfenbrenner, 1979). Similarly, Vygotsky's sociocultural theory supports that cognitive development of children is shaped by the child's social interactions and the characteristics of the environment (Gestwicki, 2007). Considering the environmental factors affecting child development, especially in the preschool period, it is possible to say that the most influential one is the family. The concept of family mentioned here refers to parents who are considered as primary caregivers. The primary factor contributing to the significant impact of parents on a child's development is that the family serves as the child's closest and most familiar microsystem. (Hayes et al., 2022), and they are the people with whom children interact most in the first years of their lives. In this crucial period spent in close contact with the family, both the and quantity of the relationship between child and parent play a crucial role in the developmental process. Because, parents are children's first teachers, role models and first guides in learning processes (Walberg, 2011). For that reason, the active involvement of parents in early childhood education is considered as a significant component of the developmental processes of children in preschool. In this critical period in children's lives, the child, family and school should be thought of as inseparable parts of a whole and these components should act in cooperation throughout the entire education process.

Within this context, family involvement can be defined as an ongoing engagement where parents and other family members actively participate in an early childhood education program, aiming to enhance the education and overall growth of children (Morrison, 2003). Numerous researchers and policymakers recognize family involvement as a crucial element in successful early childhood education (Ginsburg-Block e al., 2010; Zigler & Muenchow, 1992). Additionally, there is evidence to indicate that family involvement can act as a protective factor for children and adolescents who face a higher risk of academic failure (Jeynes, 2003). Active family participation in preschool period, which is accepted as a crucial component that affects both developmental processes and the level of academic achievement of the children, has the potential to be affected by different factors such as demographic characteristics of the family members. In relation to this, there is research suggesting the gender of parents is a factor which affects the degree of family involvement (Orcan-Kaçan et at., 2020). In light of the study's results, researchers find that the level of involvement of mothers in early childhood education which includes communicating with the teacher, creating a qualified learning environment at home and participating in school activities, is higher compared to fathers (Orcan-Kaçan et at., 2020). In addition to parental gender, research suggests that family involvement is influenced by various factors such as family structure, ethnicity, socioeconomic status (SES) and family networking (Ho, 2006). Moreover, studies have emphasized the positive associations between parental education, family SES level, and the academic achievements of students (Caldas & Bankston, 1997; Jeynes, 2002; Mitchell & Collom, 2001; Parelius & Parelius, 1987). Building upon this positive correlation, Lareau identified three distinct characteristics that provide upper-middle-class parents with an advantage in their involvement. Firstly, upper-middle-class parents possess the knowledge and confidence to assist their children with school-related tasks because they possess the ability to comprehend the curriculum and effectively communicate with teachers. Secondly, they have stronger social networks comprising other families, friends, and neighbors, which grants them access to crucial information about their children's education. Thirdly, these parents possess greater financial resources that enable them to afford childcare, transportation, tutoring, and other related expenses. As a result, they have the flexibility to rearrange their work schedules and actively participate in school-related activities (Lareau, 1989). Hence, it is affirmed by Brown and Lareau that

parental education, occupation, and family income constitute diverse resources that significantly influence the extent of family involvement in children's education (Brown, 1991; Ho, 1997; Lareau, 1989).

Considering the place and importance of family involvement in early childhood education in the literature, this present study is designed to examine whether there is a significant difference in the degree of family involvement depending on the demographic characteristics of the parents.

Research Questions

1. Is there a significant difference in family involvement based on the gender of parents?
2. Is there a significant correlation between the age of parents and family involvement?
3. Is there a significant correlation between the parenting age and family involvement?
4. Is there a significant difference in family involvement based on SES of parents?
5. Is there a significant difference in family involvement based on the education level of parents?

Method

Participants

The participants of the study consisted of 137 parents (Mage=37.36, 14 fathers and 123 mothers) with children between the ages of 2-6, currently enrolled pre-school education. Sample size was calculated as 180 using Gpower (α=0.05, β=0.80, f=0.25, k=4). All of the participants participated in the study voluntarily. The participants perceived their socio-economic level as 10% low, 85% medium and 5% high. The distribution of education level of the participants was 3.6% primary school, 2.9% secondary school, 30% high school, 49.3% university, 10.7% master's and 3.6% doctorate.6.4% of the parents stated that they live separately and 93.6% of them live together. The distribution of the participants according to the number of children they have is as follows: 38.6% of parents having one child, 51.4% having two children, and 10% having three or more children.

Instruments

In the research, in order to obtain information about preschool children and their parents, Personal Information Form and "Family Involvement Questionnaire" adapted to Turkish culture were used as data collection tools. These were answered by the parents.

Personal Information Form: In this form, there are questions about demographic characteristics of parents such as the gender of the parent, year of birth, education level, socioeconomic level, marital status, year of first parenting, gender of the child, year of birth of the child and the number of children in the family.

Family Involvement Questionnaire: The original Family Involvement Questionnaire (FIQ) is developed by Fantuzzo et al. (2000) and Perry et al. (1997, 2002) and it consists of 42 questions in three subdimensions which are School-Based Involvement, Home-Based Involvement and Home-School Based Involvement. This questionnaire is adapted to Turkish culture and its validity and reliability analyzes were made by (Ahmetoğlu et al., 2018). Confirmatory Factor Analysis was performed by Ahmetoğlu et al. (2018) in order to determine the validity and reliability of the 3-factor model designed in the original study for

Turkish participants. According to analysis, Cronbach's Alpha co-efficients for Home-Based Involvement, School-Based Involvement and Home-School Conferencing are .84, .77 and .88, respectively (Ahmetoğlu et al., 2018). In this study, the version of the questionnaire adapted to Turkish culture was used and three subdimensions in the original questionnaire were adhered to. The concept of Home-School Based Involvement encompasses interactions between parents and educators concerning the education of child, Home-Based Involvement pertains to the actions parents take at home to establish a conducive learning environment for their children and the School-Based Involvement dimension refers to the activities that families engage in at school alongside their child (Ahmetoğlu et al., 2018). The scale is in 4-point Likert type, scored as "Rarely=1, Sometimes=2, Often=3 and Always=4".

Procedure

In order to use The Family Involvement Questionnaire (FIQ), the fourth author of "Adaptation of family involvement questionnaire into Turkish culture" article Ezgi Akşin Yavuz was contacted through email and permission was obtained. The questionnaire was delivered to the participants via Google Forms and the data were collected between April 1 and May 1, 2023. The participants were provided with information that their involvement in the study was both anonymous and voluntary. This study was approved by Boğaziçi University Social and Human Sciences Human Research Ethics Committee's (SBINAREK) Review Board 2023/04 numbered decision.

Data Analysis

The quantitative data obtained via the "Personal Information Form" and the "Family Involvement Questionnaire" were analyzed using "SPSS 25". In the data analysis process, besides descriptive statistics, parametric statistical tests: independent samples t-test, Pearson Correlation and One-Way ANOVA, and non-parametric statistical test Kruskal Wallis H were used. In order to examine normality of continuous variables, skewness and kurtosis values investigated. Normality tests revealed that the scores for home-based involvement among participants with a high school education level did not show a normal distribution. Therefore, whereas independent samples t-test was used to test the significance of the difference between the family involvement scores of two normally distributed independent groups and One-Way ANOVA was used to calculate the significance of the difference between the scores of three or more independent normally distributed groups, the Kruskal Wallis H test was used to test the significance of the difference between the scores of three or more groups that did not show normal distribution. Also, Pearson correlation test was applied to assess the correlation between continuous variables. The significance level was accepted as .05 in all analyzes performed with the research data.

Findings

Independent samples t-test was used to test the significance of the difference between the family involvement scores of mothers and fathers. As a result of the analysis, it was determined that there was a significant difference between the family involvement scores of the mothers and fathers in all three sub-dimensions. Table 1 shows the mean values of the family involvement scores of the participants in three sub-dimensions based on their gender. Table 2 demonstrates the results of independent t-test for family involvement according to gender of parents and p values for each sub-dimension. As shown in Table 1, the family involvement scores of the mothers were higher in school-based involvement (M=26.08, SD=7.83), home-based involvement (M=37.28, SD=4.81) and home-school

based involvement (M=25.96 SD=7.71) than fathers' scores in school-based involvement (M=16.92, SD=7.12), t (125) =4,029, p=.000, home-based involvement (M=28.46, SD=6.05), t (131) = 6.110, p=.000 and home-school based involvement (M=20.79, SD=7.80), t (129) = 2.368, p=0.19.

Table 1

Means of Family Involvement According to Gender of Parents

	Gender	N	M	SD	SE Mean
School-based involvement	Woman	114	26.08	7.83	.73
	Man	13	16.92	7.12	1.98
Home-based involvement	Woman	120	37.28	4.81	.44
	Man	13	28.46	6.05	1.68
Home-school based involvement	Woman	117	25.96	7.71	.71
	Man	14	20.79	7.80	2.08

Table 2

Results of Independent Samples t-test for Family Involvement According to Gender of Parents

		t	df	p
School-based involvement	Equal variances assumed	4.029	125	.000
Home-based involvement	Equal variances assumed	6.110	131	.000
Home-school based involvement	Equal variances assumed	2.368	129	.019

To explore the potential connection between parental age and family involvement during the preschool period, a correlation analysis was conducted. Table 3 indicates that the analysis revealed a negative correlation between the level of home-based family involvement and the age of the parents, r (131) =-.246, p=.005. It has been determined that as the age of the parents increases, the level of home-based involvement decreases.

Table 3

Correlations for Parental Age Variable

	M	SD	1	2	3
Age of Parents	37.36	4.87	1		
School-based involvement	25.14	8.22	-0.07	1	
Home-based involvement	36.41	5.58	-0.25**	0.46**	1
Home-school based involvement	25.40	7.86	-0.09	0.55**	0.48**

*. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Correlation analysis was performed to determine whether there is a significant relationship between the first parenting age and family involvement. According to the analysis results seen in Table 4, a negative correlation was found between the first parenting age and all three sub-subdimensions of family involvement: school-based involvement r (122) =-.238, p= .008, home-based involvement r (128) =-.180, p=.042, home-school based involvement r (126) =-.197, p=.027. Therefore, as the first parenting age decreases, the level of family involvement increases in all three sub-dimensions.

Table 4

Correlations for First Parenting Age Variable

	M	*SD*	1	2	3
1 First Parenting Age	28.74	4.48	1		
2 School-based involvement	25.14	8.22	-0.24**	1	
3 Home-based involvement	36.41	5.58	-0.18*	0.46**	1
4 Home-school based involvement	25.40	7.86	-0.09	0.55**	0.48**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

In order to examine whether there is a significant difference between the socioeconomic levels of the parents and the level of family involvement One-Way ANOVA was applied, and a significant difference was determined in the level of home-based family involvement of parents F (2,132) = 3,868, p =.023. In order to fully understand group differences in ANOVA, post hoc tests were conducted. As a result of multiple comparison analysis statistics including the Bonferroni test, a significant difference was found in the family involvement levels of parents with medium and high socioeconomic levels. Therefore, it has been determined that parents with high socioeconomic levels have higher home-based involvement scores.

Table 5

Means and Standard Deviations of Family Involvement according to Socioeconomic Levels of Parents

		N	*M*	*SD*
School-based involvement	Low SES	12	24.41	10.47
	Medium SES	108	24.94	7.89
	High SES	7	29.43	9.95
	Total	127	25.14	8.22
Home-based involvement	Low SES	12	36.00	6.15
	Medium SES	114	36.11	5.48
	High SES	7	42.00	3.42
	Total	133	36.41	5.58
Home-school based involvement	Low SES	13	26.08	7.57
	Medium SES	111	25.08	7.60
	High SES	7	29.29	11.94
	Total	131	25.40	7.86

Table 6

One-Way Analyses of Variance in Socioeconomic Levels of Parents and Family Involvement

		Sum of Squares	df	Mean Square	F	p
School-based involvement	Between Groups	139.15	2	69.58	1.03	.360
	Within Groups	8372.30	124	67.52		
	Total	8511.45	126			
Home-based involvement	Between Groups	230.74	2	115.37	3.87	.023
	Within Groups	3877.52	130	29.83		
	Total	4108.26	132			
Home-school based involvement	Between Groups	122.94	2	61.47	.996	.372
	Within Groups	7902.62	128	61.74		

Total	8025.56	130	

In order to investigate whether there is a significant difference between the education level of the parents and the family involvement, Kruskal Wallis H was applied to examine the home-based family involvement for parents who had a high school education and did not show a normal distribution and no significant difference was found. One-way ANOVA was applied for school-based and home-school based family involvement, and no significant difference was found between the groups. Therefore, it was concluded that the level of parental education did not impact the level of family involvement.

Tablo 7

Means and Standard Deviations of Family Involvement According to Educational Levels of Parents

		N	*M*	*SD*
School-based involvement	Primary&Secondary School	7	28.43	10.44
	High School	39	27.26	7.69
	University	63	24.39	7.90
	Master&Doctorate	18	21.94	8.63
	Total	127	25.14	8.22
Home-school based involvement	Primary&Secondary School	9	26.89	8.49
	High School	38	27.82	6.71
	University	66	24.24	8.19
	Master&Doctorate	18	23.83	7.85
	Total	131	25.40	7.86

Tablo 8

One-Way Analysis of Variance in Educational Levels of Parents and Family Involvement

		Sum of Squares	df	Mean Square	F	p
Home-Based Involvement	Between Groups	470.50	3	156.83	2.40	.07
	Within Groups	8040.95	123	65.37		
	Total	8511.45	126			
Home-School Based Involvement	Between Groups	374.34	3	124.78	2.07	.107
	Within Groups	7651.22	127	60.27		
	Total	8025.58	130			

Tablo 9

Results of Kruskal- Wallis H Analysis of Home-Based Involvement According to Education Level of Parents

	Education Level of parents	N	Mean Rank
Home-based involvement	Primary&Secondary School	9	81.11
	High School	40	71.36
	University	67	65.51
	Master&Doctorate	17	55.12
	Total	133	

Tablo 10

Test Statistics of Kruskal Wallis-H Analysis

	Home-based involvement
Kruskal-Wallis H	3.45
df	3
Asymp. Sig.	.327

a. Kruskal Wallis Test
b. Grouping Variable: Education level of parents

Discussion

When the relationship between the genders of the parents and their home-based involvement, school-based involvement and home-school-based involvement is examined, it is seen that the participation of mothers in the preschool period is higher. The fact that the majority of the participants of the study were mothers, causes the results to be expected to be in favor of them. However, it is observed that the results are similar in studies conducted with samples with more father participants. For example, in the study of McWayne et a.l (2008), using the family involvement scale developed by Fantuzzo et al. (2000), although the proportion of fathers in the sample was higher than in the present study, mothers' level of family involvement was also higher in line with the results of this research. In addition, Brown et al. (2001) stated that, according to the 1999 National Household Education Survey, only 24% of fathers with children aged 3 to 5 years were found to be highly involved in school-based activities which is about half the level of mothers' participation in these activities. Although fathers' participation has increased compared to previous years, according to the data obtained from the results of the research, maternal participation still constitutes the majority compared to fathers. In other words, the family involvement rate of fathers in the preschool period is not as high as that of mothers yet. It is evident in studies that mothers are more involved, but still mothers want to participate more. According to the study of Williams et al (2002), a survey conducted in the UK revealed that 72% of mothers expressed a desire to increase their involvement in their child's education. In other words, mothers recognize the importance of family involvement in both early childhood and later stages.

This present study revealed a negative correlation between the age of parents and home-based involvement, indicating a decrease in home-based involvement as parent age increases. Interestingly, findings of research contradict those of numerous studies that suggest children of older mothers tend to have better developmental advantages. It is probable that older mothers create a nurturing and supportive home environment, thereby effectively preparing their children for preschool and subsequent school experiences. Additionally, research indicates that three-year-old children of older mothers exhibit enhanced language development and a reduced risk of unintentional injuries (Sutcliffe et al., 2012, as cited in Barnes et al., 2014). Parents who are aware of the contribution of home-based involvement in the development process of children are likely to take action to increase the level of it. Kiernan (1997) suggests that young parents, both mothers and fathers, tend to have a higher likelihood of belonging to economically disadvantaged families and having lower levels of education. One possible explanation for why older mothers provide greater developmental opportunities for their children could be attributed to their higher levels of education and socioeconomic status (SES) in comparison to younger mothers. This is because higher levels of education often lead parents to have a greater awareness of the significance of their children's development. Another reason why older mothers are more aware of their children in preschool may be that these mothers are

more experienced than young mothers. It seems that teenage mothers may have a slightly lower likelihood compared to older mothers in terms of being knowledgeable about appropriate developmental milestones, understanding the appropriate types and levels of stimulation required for a child at a specific age, and knowing how to respond appropriately to the child's behavior at different stages (De Lissovoy, 1973; Epstein, 1979, as cited in Roosa et al., 1984). The fact that older mothers are aware that their children have different needs at different ages will allow them to offer their children more opportunities in the home environment.

When the relationship between parenting age and home-based, school-based, home-school-based involvement was examined, we obtained a negative correlation. In other words, as the age of parenting decreases, the family participation rate increases, or as the age of parenthood increases, the family participation rate decreases. Looking at other research, we found very few articles that addressed the link between parenting age and family involvement. Some studies say that maternal and paternal satisfaction increases with age, but in our study, it was revealed that mothers and fathers show more interest in family involvement at younger ages. According to the research of Seçer, Celiköz and Yasa, as the age of becoming a father for the first time increases, fathers' self-efficacy towards fatherhood, satisfaction with paternity and general attitude scores towards fatherhood also increase (Seçer et al., 2007). Young parents want to play a more active role in their children's educational life so they show more interest in family involvement in the preschool period.

In order to understand the rationale behind results of survey, we must look at various studies that were conducted around the family involvement issue in relation to the parents' SES. Arnold et al. (2019) expressed partial interest in exploring the connection between pre-literacy development and the socioeconomic status (SES) of families. The article illustrates a positive correlation between preliteracy development and families' SES inputs. The researchers asked parents to show up to a center to participate in a study regarding parents' involvement with their children in preschool. However, the study resulted in only 62% of parents showing up. The reason for the low participation percentage is that many of the centers that conducted the study served communities with low SES, and compared to families with high SES, families with low SES tend to participate less in these kinds of studies, even though they are encouraged to volunteer (Arnold et al., 2008). Moreover, some notable cultural aspects of the study were also presented in the aforesaid article. This study also shows that different cultures tend to have different expectations of teacher-student relationships, teachers' authority, and language barriers. Furthermore, according to the study, the relation between ethnicity and SES were also largely confounded (Arnold et al., 2008). Considering how minorities are more likely to be affected by poverty (Wong & Hughes, 2006), they are more likely to spend their time and resources on fundamental needs. To make it clear, they have neither the resources nor the time to take care of their children. In other words, they are less likely to have a high level of involvement with their children in the preschool period. The correlation between ethnicity and poverty might be one of the reasons why families with high SES tend to have higher levels of involvement in the early years of childhood. This being said, the question about the relationship between ethnic poverty and parental involvement is a topic broader than the issue of the original question, making it harder to talk about the details. However, it must be considered that SES is highly correlated with various different issues.

Another important aspect of SES is parental education level. The education level of a parent is a crucial indicator of SES. This also affects the home environment and the

atmosphere for children since parents with a high educational level have more capacity and skills for healthier lifestyles than parents with a lower educational level (Määttä et al., 2017).

When considering the explanation about the correlation between SES and educational level, the result of the survey regarding educational level of parents and family involvement of parents in preschool becomes quite interesting. This result might have two rationales: First, participation levels in the said survey were low within families with a higher level of education, and the latter is the informal economy of Türkiye. High inflation, unemployment, and migration are some of the factors contributing to the growth of the informal economy in Türkiye (Ela, 2013). These factors create unequal and inadequate income. As a result of the informal economy, people who are willing to get paid more in a short amount of time, are preferring job opportunities inside the informal economy. Thus, the participants' income might be an indicator of the informal economy rather than the participants' jobs or educational level.

Conclusion and Suggestions

As a result of the research, findings related to the level of family participation and the effect of demographic factors on family participation were obtained. The aim of our research was to determine what factors affect family participation in the preschool period. It is estimated that family involvement in the preschool period has positive and negative effects on school success in the child's future life. Therefore, the factors affecting family participation were examined. Now, back to the relationship between parent involvement and our school performance, there is a higher probability that children who have parents actively engaged in school-related activities will demonstrate better academic performance (Stevenson & Baker,1987). Thus, it became clearer what areas we should focus on in order to increase family participation, and what options we should offer parents or teachers. First of all, the fact that mothers participate more actively than fathers shows that family participation programs should include content for fathers or that appropriate activities should be organized to attract fathers. Another finding was that home-based participation was lower as the age of the parent increased. At this point, what needs to be done is how to increase home-based participation in parents in the increasing age group. Teachers can send home-based kits to families to increase home-based engagement. For working parents, activities that can be implemented in a shorter time and seminars on how to spend time with the child can be given. The increase in participation as the age of parenting decreases shows us that young parents attach more importance to family participation. Parents with higher parenting age should be identified as what is holding them back from family participation and they should be encouraged to play an active role in family participation. As age increases, intolerance, work life, stress and many other factors may decrease family participation. At this point, applications such as psychological support to parents and less working hours can be developed by the government. Parents with higher socioeconomic status show more home-based participation. The level of financial well-being affects family participation in home-based participation. In order to increase the home-based participation of parents from low SES, activities can be directed with expert knowledge on how to spend more quality time at home with their children. Another issue that is examined was the relationship between education level and family involvement. It was determined that there was no change in the level of participation according to the education level. Based on the results of the present study, it was concluded that gender and age of parents, age of first-time parenthood and socioeconomic level of family were identified as influential factors in determining the level of family involvement in preschool period.

Ethics Statement

All procedures followed were in accordance with the ethical standarts of the Bogazici University Ethics Committee on human experimentation and with the Helsinki declaration of 1975, as revised in 2000.

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Okul Öncesi Eğitimde Bütünleştirilmiş Fen ve Matematik Etkinliklerin Çocukların Bilimsel becerilerine Etkisinin İncelenmesi*

The Effect of Integrated Science and Mathematics Activities in Preschool Education on Children's Scientific Skills

Ayşe Güler Küçükturan[1], Ayşenur Erdönmez [2]

ÖZ

Bu çalışmanın amacı fen ve matematik etkinliklerinin bütünleştirilmesinin okul öncesi çocukların temel bilimsel becerilerinin gelişimine etkisini incelemektir. Çalışma grubunu anaokuluna devam eden 5 yaşındaki 40 çocuk oluşturmuştur. Nicel araştırma deseninde planlanan bu çalışmada veri toplama aracı olarak "Okul Öncesi Çocuklar İçin Temel Beceriler Ölçeği" kullanılmıştır. Deney ve kontrol gruplarına ön test ve son test uygulanmış ve sonuçlar karşılaştırılmıştır. Son test sonuçlarına göre deney grubundaki çocukların puanlarının kontrol grubundaki çocukların puanlarından yüksek olduğu, bütünleştirilmiş fen-matematik etkinlikleri ile eğitimin çocukların fen ve matematik becerilerini daha fazla geliştirdiği görülmüştür. Ayrıca Kontrol grubu çocukların fen ve matematik becerileri ön test ve son test puanları arasındaki fark incelendiğinde aradaki farkın anlamlı olmadığı görülmüştür.

Anahtar Kelimeler:
Okul Öncesi, Erken Çocukluk, Fen ve Matematik, Bütünleştirilmiş Etkinlik.

ABSTRACT

The aim of this study was to investigate the effect of integrating science and mathematics activities on the development of preschool children's basic scientific skills. The study group consisted of 40 5-year-old children attending kindergarten. In this quantitative research design study, "Basic Skills Scale for Preschool Children" was used as a data collection tool. The pretest and posttest were applied to the experimental and control groups and the results were compared. According to the post-test results, it was seen that the scores of the children in the experimental group were higher than the scores of the children in the control group, and that education with integrated science-math activities improved children's science and mathematics skills more. In addition, when the difference between the pre-test and post-test scores of the control group children's science and mathematics skills was examined, it was seen that the difference was not significant.

Keywords:
Preschool, Early Chilhood, Science and Math, Integrated Activity.

Extended Abstract

Aim

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Connected experiences offer rich opportunities for conceptual development through scientific exploration, reflection, and question development (Gelman and Lucariello 2002). Actually, most importantly, scientific inquiry provides meaningful opportunities for children to have experiences that integrate language, literacy, mathematics and science education (Gerde et al. 2013). Integrated activities reflect the fact that young children's natural ways of learning are holistic rather than artificially divided into work and play or academic categories. It allows children to experience the same "target" concepts in various ways. This both reinforces the desired concept and respects the fact that different children have different learning styles (French, 2004). Therefore,

Method

This study examines the effect of integrated science-mathematics activities applied to 5-year-old children studying in a pre-school institution on the basic scientific skills of the child. The study group of the research consisted of 40 children aged 5 years attending a kindergarten. The study group was formed by cluster sampling, one of the easily accessible sampling methods. Two 5-year-old groups (A and B branches) consisting of 20 children were determined by drawing lots as the experimental and control groups. In this study, which was planned in a quantitative research design, the Personal Information Form prepared by the researcher and the Basic Skills Scale for Preschool Students were applied as data collection tools.

The "Basic Skills Scale for Preschoolers" scale developed by Aydoğdu and Karakuş (2017) consists of 20 questions in total, 4 of which are for observation, classification, inference, measurement and estimation skills. The reliability coefficient of the scale (KR-20) was found to be 0.743, and the mean difficulty of the scale was 0.69. In addition, it was determined that the item discrimination index of each question ranged between 0.228 and 0.558. The data collection tool prepared to determine the scientific process skills of preschool students is a concept test with 3 options. The answers to the items in the test consist of two wrong and one correct item. The lowest score that can be obtained from the scale is 0 and the highest score is 20.

Results

In this study, which was carried out to examine the effect of science and mathematics integrated activities applied to 5-year-old children attending pre-school education on science and mathematics skills, it was observed that children's science and mathematics skills improved positively. Pre-test and post-test were applied to the experimental and control groups, and the results were compared. According to the pre-test results, there was no significant difference between the experimental and control group students ($U=199.50$; $p>0.05$). This result indicates that the two groups were equivalent before the study. This is important for the validity of the study. According to the post-test results applied to the experimental and control groups after the application, it was observed that the scores of the children in the experimental group were higher than the scores of the children in the control group (experimental group mean rank: 29.78; control group mean rank: 11.23). This shows that education with integrated science-mathematics activities improves children's science and mathematics skills more. On the other hand, when the difference between the pre-test and post-test scores of the experimental group students to whom integrated science-mathematics activities were applied, it was seen that the difference was in favor of the post-test ($z=3,829$; $p<05$). This result shows how effective integrated activities are in improving children's science and mathematics skills in a positive way. When the difference between the pre-test and post-test scores of the control group children for science and mathematics skills was

examined, it was seen that the difference was not significant (z=0.285; p>.05). This situation constitutes the idea of how important it is to implement science and mathematics activities in a certain systematic by integrating and the application time and number of applications, rather than preparing and applying science and mathematics activities separately within the framework of the same program.

Discussion and Conclusion

The results of the research show how effective integrated activities are in improving children's science and mathematics skills in a positive way. Furner & Kumar's (2007) statement that since science and mathematics concepts are related concepts, they should be planned by integrating using appropriate methods and techniques supports this result. According to him, if teachers do their best to integrate math and science, they can affect students' lives forever. Student success depends on the degree to which math and science are integrated to encourage students to learn meaningfully. In addition, Epstein (2006) states that scientific inquiry offers opportunities to develop mathematical concepts and skills in a concrete way, emphasizing the importance of integrated activities. Because young children use various measurement concepts such as quantity, length and conservation, which are the basic components of mathematical development, while making observations and experiments, and they begin to understand science facts and reason about relationships by thinking algebraically. On the other hand (Whitin & Whitin, 2003), it is stated that the relationships established with the charts, diagrams and graphs made during scientific research, the discussion of equality and inequality concepts provide concrete gains in integrated science and mathematics activities. This shows that the application of disciplines by establishing a connection with each other in the activities leads to the realization of effective learning and supports this research finding.

Giriş

Bebekler ve küçük çocuklar, doğduklarından itibaren sosyal etkileşimde bulunmaya, yürümeyi ve konuşmayı öğrenmeye biyolojik olarak hazır ve motive oldukları gibi, çevrelerindeki dünyayı öğrenmeye de biyolojik olarak hazırdırlar (Nelson ve Gruendel, 2013; Lucariello vd., 1992). Ancak yaşamım ilk yılları bireyin yetişkinlikte ulaşılacak kapasitenin gelişimi açısından çok önemlidir. Çocuklar doğar doğmaz büyük bir hızla gelişir ve öğrenirler. Meraklı ve araştırıcıdırlar. Okulöncesi yıllarda kazandıkları bilgi ve beceriler sonraki yıllarda kullanılacak temel becerilerdir. Küçük çocuklar sadece kendilerine aktarılanları öğrenmezler, aksine bilgiyi bağımsız olarak kendileri kazanırlar. Bu nedenle yaşamda karşılaşılacak olayların kavranması, dünyayı tanımaya yönelik bilginin kazanılmasında matematik ve fen en önemli iki temel alandır.

Erken çocukluk döneminde fen ile uğraşan çocukların ileriki yaşamlarında bilimsel kavramları daha iyi anladıklarına dair bulgular fen eğitiminin son yıllarda büyük ilgi görmesine neden olmuştur (Eshach ve Fried, 2005). Ancak nedenleri farklı olsa da erken çocukluk döneminde fen eğitimi ile ilgili temel sorunlardan biri öğretmenlerin sınıfta bilimsel süreci etkili bir şekilde uygulayamamaları ve nitelikli fen deneyimleri sağlayamamalarıdır (Nayfeld vd.,. 2011; Tu, 2006). Çünkü birbirleri ile bağlantısı olmayan bir dizi bağımsız deneyler yoluyla fen öğretimini gerçekleştirmektedirler (Gerde ve ark.2013).

Bireysel farklılıkları olsa da okul öncesi dönem çocukları, fen hakkında önemli ölçüde içerik bilgisi geliştirme yeteneğine sahiptir (Greenfield vd.,. 2009). Küçük çocuklar, gelişimsel olarak uygun şekillerde sunulduğunda fen kavramlarını anlayabilirler. Bu nedenle, onlara doğru fen

içeriği sağlamak, dünya hakkındaki mevcut bilgilerini genişletmek ve yanlış anlamaları düzeltmek için şarttır (Duschl vd.,. 2006).

Bilimsel sorgulama için, matematik kavramlarını ve becerilerini somut bir şekilde geliştirmek gereklidir. Çocuklar doğduklarında duyularıyla nesnelerin renk, şekil, yapı ve boyut bilgilerini alır ve yaşadıkları dünyayı anlamlandırmaya çalışırlar. Bilgiyi eşleştirme, gruplama, sıralama yaparak yaşam içinde oluştururlar. Bu matematik becerileri onların yaşam boyu kullanacakları fen kavramlarının oluşmasına katkı sağlar. Fen ve matematik eğitiminin mümkün olduğunca erken yıllarda yapılması ve bu yönde bir kültür oluşturulması gerekmektedir. Erken yıllarda yapılan fen ve matematik eğitimi mevcut bilgileri aktarmaktan çok, bilgiye ulaşma becerilerini geliştirmeyi amaçlamaktadır. Bu, ezberleyerek değil kavrayarak öğrenmeyi, karşılaşılan yeni durumla ilgili problem çözmeyi ve bilimsel yöntem becerilerini geliştirmeyi gerektirir. Fen eğitiminde, bireylerin içinde yaşadıkları çevreyi bilimsel olarak incelemeleri amaçlanır. Bilimsel yöntemin kazandırılmasında yaparak-yaşayarak öğrenmenin önemi büyüktür. Bu yolla çocuklar, problemi belirlemeyi, gözlem yapmayı, soru sormayı, hipotez kurmayı, bilgiyi toplayıp analiz etmeyi ve sonuca ulaşarak problemi çözmeyi öğrenirler. Bu beceriler çocuklara yaşadıkları dünya ile ilgili yüksek bir farkındalık yaratır.

Erken çocukluk eğitimcileri, fen eğitimini olguların aktarılması ve genişletilmesi değil bir bilgi edinme süreci olarak görürler (Gelman ve Brenneman 2004). Fen, çocukların dil, okuryazarlık ve matematik becerilerini geliştirdikleri önemli bir bağlam oluşturur. Ayrıca, fen hakkında bilgi edinmek, çocukların akademik ve dil becerileri ile ilgili kavram gelişimine katkı sağlar (Mashburn vd., 2008). Kavramsal gelişim için bağlantılı deneyimler bilimsel keşif, yansıtma ve soru geliştirme yoluyla zengin fırsatlar sunar (Gelman ve Lucariello 2002). Aslında en önemlisi, bilimsel sorgulama, çocuklara dil, okuryazarlık, matematik ve fen eğitimini bütünleştiren deneyimler yaşamaları için anlamlı fırsatlar sağlar (Gerde vd., 2013).

Bütünleştirilmiş etkinlikler, küçük çocukların doğal öğrenme yollarının yapay olarak iş ve oyun ya da akademik kategorilere bölünmüş olmaktan çok bütüncül olduğu gerçeğini yansıtır. Çocukların aynı "hedef" kavramları çeşitli şekillerde deneyimlemelerini sağlar. Bu, hem kazanılması istenen kavramı pekiştirir hem de farklı çocukların farklı öğrenme stillerine sahip olduğu gerçeğine saygı gösterir (French, 2004). Adsız ve Kutluca'nın (2023), yaptığı "Bilimsel Süreç Becerilerinin Bütünleştirilmiş Fen ve Matematik Etkinlikleri Aracılığıyla Kazandırılmasına Yönelik Öğretmen Görüşleri: Bilimin Doğası Anlayışlarının Etkisi" çalışmasında okul öncesi öğretmenlerinin bilimin doğası anlayışlarının yüksek olduğunu göstermiştir. Bilimin doğası anlayışı orta ve yüksek düzeyde olan okul öncesi öğretmenleri bütünleştirilmiş etkinlikler sırasında bilim okuryazarlığı vizyonuna, bilimin doğası anlayışı düşük düzeyde olan katılımcı ise kavram öğretimine odaklanmışlardır. Fen ve matematik etkinliklerinin bütünleştirilmesine yönelik çalışmaların stem uygulamaları ile ilgili olduğu ve genellikle ilkokul ve ortaokul düzeyinde gerçekleştirildiği görülmektedir (Çetin ve Kahyaoğlu, 2018; Eroğlu ve Bektaş, 2016). Okul öncesi dönem çocuklarla yapılan çalışmaların ise öğretmen görüşleri ile ilgili olduğu belirlenmiştir (Adsız ve Kutluca, 2023; Abacı, 2020; Eroğlu ve Bektaş, 2016).

Bu nedenle bu çalışmanın amacı fen ve matematik etkinliklerinin bütünleştirilerek uygulanmasının okul öncesi dönem çocuklarının temel bilimsel becerilerinin gelişimine etkisini incelemektir.

Yöntem

Araştırma Modeli

Bu çalışma, okul öncesi kurumunda eğitim alan 5 yaş çocuklarına uygulanan bütünleştirilmiş fen-matematik etkinliklerinin çocuğun temel bilimsel becerilerine etkisini inceleyen, ön test-son test kontrol gruplu deneysel desenin kullanıldığı bir araştırmadır.

Araştırmanın Çalışma Grubu

Çalışma grubunu, 2021-2022 eğitim öğretim yılı, Düzce ili Cumayeri ilçesi Milli Eğitim Bakanlığı'na bağlı bir anaokuluna devam eden ve daha önce okul öncesi eğitim almamış 5 yaş grubu 40 çocuk oluşturmuştur. Çalışma grubu kolay ulaşılabilir örnekleme yöntemlerinden küme örnekleme yoluyla oluşturulmuştur. Okulda 20 çocuktan oluşan iki 5 yaş grubu (A ve B şubesi) deney ve kontrol grubu olarak kura yöntemiyle belirlenmiştir. Küme örnekleme yöntemi; ayrı ayrı bireyler olarak değil gruplar aracılığıyla yapılan örnekleme yöntemidir. Evren çok büyük ve ele alınması zor ise bu yöntemin kullanılması oldukça elverişlidir (Özen ve Gül, 2007). Deney ve kontrol grubu öğretmenlerinin mezun olduğu okul ve mesleki kıdem açısından birbirlerine denk olmalarına dikkat dilmiştir.

Tablo 1

Çocukların demografik bilgileri

		Deney Grubu		Kontrol Grubu	
		n	**%**	**n**	**%**
Cinsiyet	Kız	9	45	9	45
	Erkek	11	55	11	55
Çocuk Sayısı	Tek çocuk	4	20	5	25
	2 çocuk	9	45	10	50
	3 çocuk	4	20	4	20
	4 çocuk	1	5	1	5
	5 çocuk	2	10		
Doğum sırası	1.çocuk	13	65	9	45
	2.çocuk	4	20	7	35
	3.çocuk			3	15
	4.çocuk	3	15	1	5
	Toplam	**20**	**100**	**20**	**100**

Tablo 1 incelendiğinde araştırmaya katılan çocuklardan deney grubu kız çocukların sayısı 9, erkek çocukların sayısı 11, kontrol grubu kız çocukların sayısı 9, erkek çocukların sayısı ise 11'dir. Araştırma deney ve kontrol grubunu oluşturan 22 erkek çocuk, 18 kız çocuk olmak üzere toplam 40 çocuk ile gerçekleştirilmiştir.

Deney ve kontrol grubundaki çocukların çocuk sayılarına göre dağılımlarına bakıldığında, araştırmaya katılan çocuklardan deney grubu çocuklarının 4'ü tek çocuk, 9'u iki çocuk, 4'ü 3 çocuk, 1'i 4 çocuk ve 2'si 5 çocuktur. Kontrol grubu çocuklarının 5'i tek çocuk, 10'u 2 çocuk, 4'ü 3 çocuk, 1'i 4 çocuktur.

Deney ve kontrol grubundaki çocukların doğum sıralarına göre dağılımlarına bakıldığında, araştırmaya katılan çocuklardan deney grubunun 13'ü ilk çocuk, 4'ü ikinci çocuk ve 3'ü dördüncü çocuktur. Kontrol grubunun 9'u ilk çocuk, 7'si ikinci çocuk, 3'ü üçüncü çocuk ve 1' i dördüncü çocuktur.

Tablo 2

Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği Ön Test Puanlarının Deney ve Kontrol Grupları Değişkenine Göre Farklılaşıp Farklılaşmadığına İlişkin Mann-Whitney U Testi Sonuçları

	Gruplar	n	Sıra ortalaması	Sıra toplamı	u	z	p
Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği ön test	Deney	20	20,53	410,50	199,50	-0,014	0,989
	Kontrol	20	20,48	409,50			

Tablo 2, deney ve kontrol grubunun "Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği" den aldıkları ön test puanları arasında fark olup olmadığını belirlemek için yapılan Mann-Whitney U testi sonuçlarını göstermektedir. Buna göre gruplar arasında fark olmadığı görülmektedir (U=199,50; p>0,05). Bu sonuç, deney ve kontrol grubu çocuklarının fen ve matematik becerilerinin uygulama öncesinde birbirine denk olduğunu göstermektedir. Dolayısıyla deney ve kontrol grubunun ön test puanlarının birbirine yakın, istenilen düzeyde olması, çalışmaya iki grupta da bulunan çocukların dâhil edilebileceğini göstermektedir.

Veri Toplama Araçları

Nicel araştırma deseninde planlanan araştırmada, araştırmacılar tarafından hazırlanan "Kişisel Bilgi Formu" ve "Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği" veri toplama aracı olarak kullanılmıştır.

Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği

"Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği" Aydoğdu ve Karakuş (2017) tarafından geliştirilmiştir. Ölçek; gözlem, sınıflama, çıkarım yapma, ölçme ve tahmin becerilerine yönelik 4'er soru olmak üzere toplamda 20 sorudan oluşmaktadır. Ölçeğin güvenirlik katsayısı (KR-20) 0.743, ölçeğin ortalama güçlüğü ise 0.69 olarak bulunmuştur. Ölçek, okulöncesi öğrencilerinin bilimsel süreç becerilerini saptamak amacıyla hazırlanan veri toplama aracı 3 seçenekli bir kavram testidir. Her sorunun 1 doğru 2 yanlış seçeneği bulunmaktadır. Doğru cevap 1, yanlış cevap 0 puandır. Ölçekten en düşük 0 ve en yüksek 20 puan alınmaktadır.

Araştırma Süreci

Araştırma öncesinde okul yönetimine ve öğretmenlere araştırma süreci ve uygulamanın nasıl ilerleyeceği ile ilgili bilgilendirme yapılmış, sürecin sağlıklı ilerlemesi için gerekli önlemler alınmıştır. Uygulama öncesinde kontrol grubu öğretmenine araştırmanın amacı hakkında bilgi verilmiş, süreci kendi doğal akışı içinde yürütmesi ifade edilmiştir. Araştırmanın bitiminde araştırma etiği açısından deney grubuna uygulanan etkinliklerden kendi grubu için yararlanabileceği belirtilmiştir. Deney grubu öğretmeninin uygulama sürecinde araştırma sonucunu etkilememesi adına etkinlikler ile ilgili bilgi aktarmamaya özen göstermesi gerektiği ifade edilmiştir.

Hazırlık

Uygulamaya başlanmadan önce deney ve kontrol grubu öğrencilerinin ebeveynlerine kısa bir bilgilendirme toplantısı yapılarak süreç ile ilgili bilgi verilmiş, soruları yanıtlanmıştır. Uygulama sürecinde deney grubuna uygulanacak bütünleştirilmiş fen-matematik etkinlikleri,

çocukların gelişim dönemleri, merak ve ilgileri kapsamında araştırmacı tarafından alan uzmanının da desteği ve görüşleriyle birlikte hazırlanmıştır. Etkinlikler Milli Eğitim Bakanlığı [MEB, 2013], okul öncesi eğitim programı kazanım ve göstergelerden fen ve matematik kazanımları ile ilgili olanlar seçilerek bütünleştirilmiş olarak hazırlanmıştır. Etkinlikler planlanırken kavram seçiminde olabildiğince farklı ve çeşitlendirilebilecek kavramlar olmasına dikkat edilmiştir. Etkinliklerde kullanılacak materyallerin ulaşılabilir ve doğada da mevcut olan materyaller olmasına dikkat edilmiştir. Planlar hazırlanırken MEB okul öncesi eğitim programında bulunmayan hiç bir kavrama yer verilmemiştir. Çoğu bütünleştirilmiş fen-matematik etkinlikler için planda yer alan kavram ve kazanımlarla ilgili olarak geçici öğrenme merkezi oluşturulması önemsenmiştir. Haftada 3 gün 12 hafta boyunca gerçekleştirilecek uygulama için toplam 36 bütünleştirilmiş fen-matematik etkinliği hazırlanmıştır. Hazırlanan etkinliklere alan uzmanının görüşleri alınmış ve son şekli verilmiştir.

Deney grubu öğretmenine haftada 3 gün olmak üzere 12 hafta uygulanacak olan 36 bütünleştirilmiş fen-matematik etkinlikleri verilmiş. Gerekli materyaller temin edilerek uygulama şekli, uygulama süresi ile ilgili bilgiler ve sürecin nasıl ilerleyeceği detaylı olarak açıklanmıştır. Araştırma kapsamında uygulanan etkinliklerin sınıf öğretmeninin diğer etkinliklerini aksatmayacak şekilde planlanması araştırmacı ve öğretmen tarafından sağlanmıştır.

Verilerin Toplanması

Ön test, deney ve kontrol grubuna 2021-2022 eğitim öğretim yılının başladığı Kasım ayının ikinci haftasında araştırmacı tarafından bireysel olarak yaklaşık 10 dakikalık süre içinde uygulanmıştır. Çocuklar boş ve sessiz bir odaya teker teker alınmıştır. Çocuğun kendini rahat hissetmesi amacıyla önce sohbet edilmiş, bazı resimlere bakacağı ve sonrasında bu resimlerle ilgili soruları cevaplayacağı söylenmiştir. Ölçek uygulanırken ipucu verilmemiş, doğru yanıtlar "1", yanlış yanıtlar ise "0" puan almıştır. Çocuk "anlamadım ya da bilmiyorum" dediğinde soru daha yavaş bir şekilde tekrarlanmıştır. Son test, eğitim sonrasında 2021-2022 eğitim öğretim yılının Şubat ayının üçüncü haftasında aynı yöntemle uygulanmıştır.

Uygulama

Araştırmanın uygulama sürecinde etkinlikler deney grubu öğretmenine haftalık olarak verilmiş ve açıklamaları yapılmıştır. Etkinlikle ilgili materyaller araştırmacı tarafından temin edilmiştir. Etkinlikler, sınıf öğretmeni tarafından deney grubuna haftada 3 gün 40'ar dakika olacak şekilde 12 hafta boyunca uygulanmış kontrol grubunda ise süreç öğretmenin MEB okul öncesi eğitim programını doğal akışı içinde uygulaması sağlanmıştır. Süreç boyunca devamsızlık yapan öğrenciler için uygulama günlerinin dışında haftanın bir gününde telafi eğitimi yapılmıştır.

Verilerin Analizi ve Yorumlanması

Deney ve kontrol grubuna uygulanan ön test sonrası puan ortalamaları karşılaştırılarak gruplar arasında anlamlı bir farklılık olup olmadığı test edilmiştir. Etkinliklerin uygulanması tamamlandıktan sonra bütünleştirilmiş etkinliklerin, okul öncesi dönem çocuklarının fen-matematik becerilerine etkisini belirlemek için deney ve kontrol grubunun son test puan ortalamaları karşılaştırılmıştır.

Çalışma sonucunda elde edilen veriler araştırmacı tarafından kodlanarak bilgisayara işlenmiş olup istatistiksel işlemlerin yapılmasında SPSS istatistik programından faydalanılmıştır.

Verilerin normallik testleri "basıklık ve çarpıklık katsayıları" ve "Shapiro Wilk testi" ile incelenmiştir. Sonuçlar deney ve kontrol grubu verilerinin dağılımının normal olmadığını göstermiştir. Veriler frekans, aritmetik ortalama, yüzdelik, standart sapma tanımlayıcı istatistiksel teknikleri kullanılarak çözümlenmiştir. Çocuklara uygulanan bütünleştirilmiş fen-matematik etkinliklerin, deney grubundaki çocukların bilimsel süreç becerilerini etkileyip etkilemediğini belirlemek için, deney ve kontrol gruplarının ön test ve son test puan farkının ortalamaları Mann Whitney U testi ile karşılaştırılmıştır. Deney grubu çocuklarına uygulanan bütünleştirilmiş fen-matematik etkinlikleri sonrası, bilimsel süreç becerileri ön test ve son test puan ortalamaları arasında farkın olup olmadığına Wilcoxon İşaretli Sıralar testi ile bakılmıştır. Aynı şekilde kontrol grubu çocuklarına uygulanan ölçeğin ön test ve son test puan ortalamaları arasında farkın olup olmadığı Wilcoxon İşaretli sıralar testi ile sınanmıştır. Verilerin analizinde anlamlılık düzeyi 0.05 olarak benimsenmiştir.

Bulgular

Bulgular araştırma soruları başlığı altında aşağıda verilmiştir.

Uygulama sonrasında deney grubu ile kontrol grubu çocuklarının temel beceri düzeyleri (son test) arasında anlamlı bir farklılık var mıdır?

Tablo 3

Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği Son Test Puanlarının Deney ve Kontrol Grupları Değişkenine Göre Farklılaşıp Farklılaşmadığına İlişkin Mann-Whitney U Testi Sonuçları

Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği son test	Gruplar	n	Sıra ortalaması	Sıra toplamı	u	z	p
	Deney	20	29,78	595,50	14,500	-5,056	0,00*
	Kontrol	20	11,23	224,50			

*** p<0,05**

Tablo 3'de deney ve kontrol grubu çocuklarının ölçekten aldıkları son test puanlarının gruplar arası anlamlı bir fark yaratıp yaratmadığını gösteren Mann-Whitney U testi sonuçları görülmektedir. Sonuçlara göre grupların sıra ortalaması arasındaki fark anlamlıdır. (U=14,500; p<0,05). Deney ve kontrol grubu arasındaki farkın deney grubu lehine istatistiksel olarak anlamlı olduğu görülmüştür. Yapılan eğitim amaca hizmet etmiştir.

Bütünleştirilmiş fen-matematik etkinlik uygulamaları sonrasında deney grubu çocuklarının temel beceri ölçeği ön test ve son test puanları arasında anlamlı bir farklılık var mıdır?

Tablo 4.

Deney Grubu Çocuklarının Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği Erişi Düzeylerinin Karşılaştırılmasına Yönelik Wilcoxon Testi Sonuçları

Son test-Ön test	n	Sıra ortalaması	Sıra toplamı	z	p
Negatif sıra	0	0,00	0,00		0,00**
Pozitif sıra	19	10,00	190,00		

***Negatif sıralar temeline dayalı ** p<0,05**

Tablo 4'te görüldüğü gibi, deney grubunun ölçekten aldıkları ön test ve son test puanları arasındaki farkın anlamlı olup olmadığı Wilcoxon testi ile belirlenmiştir. Sonuç olarak deney grubunun ön test puanları ile son test puanları arasındaki fark istatistiksel olarak anlamlıdır. (z=3,829; p<05). Bu farkın puanlarının sıra ortalaması ve toplamlarına bakıldığında, pozitif sıralar, yani son test puanı lehine olduğu anlaşılmaktadır. Bu sonuç bütünleştirilmiş etkinliklerin çocukların fen ve matematik becerilerini olumlu yönde etkilediğini gösterebilir.

Kontrol grubu çocuklarının bilimsel süreç becerisi ön test ve son test puanları arasında anlamlı bir farklılık var mıdır?

Tablo 5.

Kontrol Grubu Çocuklarının Okul Öncesi Öğrencilerine Yönelik Temel Beceri Ölçeği Erişi Düzeylerinin Karşılaştırılmasına Yönelik Wilcoxon Testi Sonuçları

Son test-Ön test	n	Sıra ortalaması	Sıra toplamı	z	p
Negatif sıra	8	9,88	79,00		
Pozitif sıra	10	9,20	92,00	0,285*	0,77
Eşit	2				

***Negatif sıralar temeline dayalı**

Tablo 5, kontrol grubunun ölçekten aldıkları ön test ve son test puanları arasında fark olup olmadığını belirlemek için uygulanan Wilcoxon testi sonuçlarını göstermektedir. Buna göre, kontrol grubunun ön test puanları ile son test puanları arasındaki fark istatistiksel olarak anlamlı değildir (z=0,285; p>,05).

Tartışma ve Sonuç

Okul öncesi eğitime devam eden 5 yaş çocuklarına uygulanan bütünleştirilmiş fen ve matematik etkinliklerinin fen ve matematik becerilerine etkisini incelemek için gerçekleştirilen bu çalışmada çocukların fen ve matematik becerilerinin olumlu yönde geliştiği görülmüştür.

Yapılan çalışmada deney ve kontrol grubuna ön test ve son test uygulanmış, sonuçları karşılaştırılmıştır. Ön test sonucuna göre deney ve kontrol grubu öğrencileri arasında anlamlı bir farklılığın olmadığı görülmüştür (U=199,50; p>0,05). Bu sonuç iki grubun çalışma öncesinde denk olduğunu göstermektedir. Bu durum çalışmanın geçerliliği açısından önemlidir.

Uygulama sonrasında deney ve kontrol grubuna uygulanan son test sonucuna göre deney grubunda yer alan çocukların puanlarının kontrol grubunda yer alan çocukların puanlarına göre daha yüksek olduğu görülmüştür (deney grubu sıra ortalaması: 29,78; kontrol grubu sıra ortalaması: 11,23). Bu durum bütünleştirilmiş fen-matematik etkinlikleriyle gerçekleştirilen eğitimin çocukların fen ve matematik becerilerini geliştirmede daha etkili olduğunu göstermektedir. Diğer taraftan bütünleştirilmiş fen-matematik etkinlikleri uygulanan deney grubu öğrencilerinin ön test ve son test puanları arasındaki farkın son test lehine olduğu görülmüştür (z=3,829; p<05). Bu sonuç bütünleştirilmiş etkinliklerin çocukların fen ve matematik becerilerini olumlu yönde geliştirmede ne derece etkili olduğunun göstergesidir.

Furner ve Kumar'ın (2007) fen ve matematik kavramlarının birbiriyle ilişkili kavramlar olmasından dolayı uygun yöntem ve teknikler kullanılarak bütünleştirilerek planlanması

gerektiği ifadesi bu sonucu destekler niteliktedir. Ona göre, öğretmenler matematik ve feni bütünleştirme konusunda ellerinden geleni yaparlarsa öğrencilerin yaşamlarını sonsuza kadar etkileyebilir. Öğrencilerin başarısı, öğrencileri anlamlı öğrenmeye teşvik etmek için matematik ve fenin ne derece bütünleştirildiğine bağlıdır. Ayrıca, Epstein (2006), bilimsel sorgulamanın matematik kavramlarını ve becerilerini somut bir şekilde geliştirmek için fırsatlar sunduğunu belirtir bütünleştirilmiş etkinliklerin önemine vurgu yapar. Çünkü küçük çocuklar, gözlem ve deney yaparken matematik gelişiminin temel bileşenleri olan nicelik, uzunluk ve korunum gibi çeşitli ölçüm kavramlarını kullanır ve fen ile ilgili olguları anlamaya ve cebirsel düşünerek ilişkiler hakkında akıl yürütmeye başlarlar. Diğer taraftan (Whitin ve Whitin, 2003), bilimsel araştırmalar sırasında yapılan çizelgeler, diyagramlar ve grafikler ile kurulan ilişkiler, eşitlik ve eşitsizlik kavramlarının tartışılmasının bütünleştirilmiş fen ve matematik etkinliklerine samut kazanımlar sağladığını belirtir. Bu durum etkinliklerde disiplinlerin birbirleri ile bağlantısının kurularak uygulanmasının etkin öğrenmenin gerçekleşmesine neden olduğunu göstermekte ve bu araştırma bulgusunu desteklemektedir.

Deney ve kontrol grubu arasındaki son test puan ortalamaları (29,78 > 11,23) arasındaki farkın istatistiksel olarak büyük oranda anlamlı ($p< 0.00$) bir fark yaratması entegre etkinliklerin çocukların etkinliğe katılma ve öğrenme motivasyonlarını arttırmış olabileceğinden de kaynaklanmaktadır. Ayrıca deney grubuna uygulanan etkinliklerde her etkinlik için materyal hazırlanması gerektiğinde geçici fen ve etkinlik merkezlerinin oluşturulması motivasyonu arttıran ayrı bir etken olarak değerlendirilebilmektedir. Moomaw ve Davis, (2010), yaptıkları çalışmada kent anaokullarında STEM öğrenimini artırmak için bir üniversite/devlet okulu ortaklığının parçası olarak 3 etkinlik geliştirilmişlerdir. Yoğun ilgi uyandıran etkinliklerin, yetenekleri ne olursa olsun, küçük çocukların STEM faaliyetlerine hazır, istekli ve katılabileceklerini doğrulamıştır. Etkinliklerle çocukların önemli bilimsel ve matematiksel ilişkiler kurdukları, bilimsel meraklarını ve matematik keşiflerini harekete geçiren materyalleri keşfettikleri saptanmıştır. Çocukların matematik ve bilimin keşfedilecek heyecan verici alanlar olabileceğini öğrenerek gelecekteki öğrenmelerini bu temel kavramlar üzerine inşa edebilecekleri belirtilmiştir.

Kontrol grubu çocuklarının fen ve matematik becerilerine ait ön test ve son test puanları arasındaki farkın anlamlı olmadığı görülmüştür ($z=0,285$; $p>,05$). Bu durum fen ve matematik etkinliklerinin aynı program çerçevesinde hazırlansa da etkinliklerin uygulama süresi, sayısı ve farklı alanlarla entegrasyonu bakımından belli bir sistematik dâhilinde uygulanmasının ne derece önemli olduğu düşüncesini oluşturmaktadır. Brenneman vd., (2009) fen öğretiminin sınıfa dâhil edildiğinde, etkisiz olduğunu ya da çocukları bilimsel sürecin yalnızca bir kısmına dâhil edecek şekilde yüzeysel bir şekilde sunulduğunu belirterek bu bulgunun bir gerekçesi olduğunu göstermektedir. Diğer bir deyişle çocuklar genellikle öğretmenlerin çok az rehberliğinde materyalleri gözlemler ve kullanırlar. Spesifik olarak, öğretmenlerin çocukları soru üretme, tahminde bulunma veya hipotez kurma gibi bilim süreç becerilerini kazandırmaya yönelik bir uygulama yapmadıklarını da (La Paro vd., 2004). Ayrıca Tu (2006) yüksek kaliteli olduğu düşünülen okul öncesi sınıflardaki gözlemsel çalışma ve fen hakkında bilgi edinme fırsatlarının son derece sınırlı olduğunu gösterdiği çalışma ile araştırmanın kontrol grubuna ait bulgusunu desteklemektedir. Çünkü, çocuklara, sınıflarda mevcut olan fen merkezlerinde sınırlı uygulama yapma fırsatı sunulmaktadır (Nayfeld vd., 2011). Ayrıca serbest oyun sırasında öğretmenler bilim merkezlerinde, dramatik oyun merkezi gibi diğer merkezlere göre daha az zaman harcamakta ve bu alanlarda çocuklara daha az rehberlik etmektedirler (Hanley vd., 2009). Genel olarak, erken çocukluk eğitimcileri bilimi diğer alanlardan daha az öğretme eğilimindedirler (Early vd., 2010). Sınıf gözlemlerini içeren araştırmalar, okul öncesi öğretmenlerinin çoğunlukla bilimle ilgili olmayan etkinliklerle (%86.8) uğraştıklarını ve nadiren resmi (%4.5) veya resmi olmayan (%8.8) bilim öğretimiyle ilgilendiklerini göstermektedir (Tu, 2006). Clements ve Sarama'nın (2016), küçük çocuklara

yeterince fen ve matematik deneyimi verilmediği, öğretmenlerin fen merkezlerine diğer öğrenme merkezleri kadar önem vermedikleri ve fenle ilgili planlı ya da plansız etkinlikleri çok az sundukları görüşleriyle doğrulanmaktadır. Aslında çocukların kendi gündelik yaşamlarında karşılaştıkları matematik ve fen ile ilgili kavramlara ilişkin deneyimler oldukça fazladır. Çocuklar bu şekilde informal yolla elde ettikleri deneyimler ve bu deneyimler sonucu oluşan bir dizi kavramla okul öncesi eğitime başlarlar (Darling-Hammond, 2000). Ancak birçok araştırma da dâhil olmak üzere çoğu yetişkin çocuklar için serbest oyunların daha iyi olduğunu ve derslerin etkili olmadığına inanmaktadır. Küçük çocuklara fen ve matematiğin öğretilmesini gereksiz bulmaktadırlar (Clements ve Sarama, 2016). Ne yazık ki Mantzicopolos vd. (2009), okul öncesi dönemde fen kavramlarını öğretmeye ayrılan sürenin toplam öğretim süresinin %10'u kadar olduğunu bildirmektedir. Bu da, çocukların bilime, fene, matematiğe karşı pozitif tutum sergilemeleri için bir fırsatın kaçtığını göstermektedir. Ancak kontrol grubuna ait sonucu, bu çalışmada kullanılan MEB programına ve öğretmenlerin sınıf içinde yürüttükleri etkinlere dayandırmak gerçekçi olmayabilir. Araştırma kapsamında göz önünde bulundurulmayan farklı değişkenlerin (ebeveyn eğitimi, baba katılımı vb.) neden olabileceği de mümkündür.

Gerde vd.,(2018), nitelikli bir erken fen eğitimi, Amerika Birleşik Devletleri'ndeki ilköğretim düzeyindeki öğrencilerinin akranlarıyla karşılaştırıldığında düşük fen becerilerini gözlemlemek için son derece önemli olduğunu belirtmişlerdir. Çocuklar erken çocukluk döneminden itibaren almaya başladıkları fen ve matematik eğitimiyle birlikte bilişsel olarak daha üst seviyelere erişebilmektedirler.

Öğretmenlerin bu aşamada kaliteli, duyulara hitap eden, merak duygusunu canlı tutan etkinliklerle çocukların etkin öğrenme yaşantıları kazanmalarına yardımcı olmalıdırlar. Bunun için de öncelikle öğretmenlerin kendilerinin fen eğitimine olan inançlarının tam olması ve yeterliliklerinin bu eğitimi vermeye hazır olması gerekmektedir. Piasta vd. (2015) öğretmenlere verilen fen ve matematik eğitimiyle ilgili mesleki gelişimin, çocuklar için öğrenme fırsatları oluşturduğunu, bu öğrenme fırsatlarının da çocukların öğrenmesiyle olumlu ilişkilendirildiğini görmüştür. Sonuçlar, çocukların küçük yaşlardan itibaren matematik ve fen öğrenme fırsatlarına sahip olmalarını sağlamak için önemli çabaların gerekli olduğunu göstermektedir.

Öğrencilere sağlanan eğitimin verimli olup olmadığı öğretmenlerin sınıfta ne yaptıklarıyla alakalıdır. Bundan dolayı bugünün öğrencilerini geleceğin başarılı, nitelikli bireyleri olmaya hazırlarken fen ve matematik öğretimlerinin etkili olması gerekmektedir. (Furner ve Kumar, 2007). Eğitim ortamının çocukların öğrenme yaşantıları için düzenlemesi, çocukları araştırma ve keşfetmeye teşvik etmesi gerekmektedir. Öğretmenler, farklı yöntem ve tekniklerle çocukların fen bilimleriyle ilgili becerilerini geliştirmeyi hedeflemelidir (Küçükturan, 2017). Fen ve matematik eğitiminin gerekliliğine inanmalı ve bu eğitimi nasıl daha etkili ve kaliteli yapabileceklerini sorgulamalıdırlar.

Öğrencilerin matematik ve fene olan güvenlerini ve yeteneklerini geliştirmelerine yardımcı olan, onların kariyerlerini ve ilerideki hayatlarını şekillendiren öğretmenlerin matematik ve feni nasıl ele aldıkları oldukça önemlidir. Kermani ve Aldemir'in (2015) yürüttükleri çalışmanın bulguları matematik ve feni temel alan kaliteli bir erken çocukluk eğitimi programının uygulanmasının çocukların genel matematik ve fen öğreniminde olduğu kadar öğretmenlerin de tutumlarında, plan yapma becerilerinde olumlu etki yarattığını göstermiştir. Aynı zamanda çalışmaya katılan öğretmenlerin planlarına dâhil ettikleri fazla sayıda matematik ve fen kavramları sayesinde öz güvenlerinin de arttığı bulunmuştur.

Yürütülen bu araştırmanın sonuçlarına bakıldığında bütünleştirilmiş olarak planlanan fen-matematik etkinliklerinin çocukların temel becerilerini olumlu yönde etkilediği görülmüştür. Bu durum özellikle okul öncesi dönemden başlayarak fen ve matematik etkinliklerinin farklı etkinlik çeşitleriyle bütünleştirilmesinin önemini ortaya koymuştur. Bu önem çerçevesinde MEB (2013) Okul Öncesi Eğitim Programının felsefesi doğrultusunda öğretmenlerin etkinliklerini birden fazla alanla bütünleştirerek uygulama yönünde kendilerini geliştirmeleri gerekmektedir. Ayrıca özellikle araştırmacıların, çocuklarla yaptıkları çalışmaları, öğretmen uygulama gözlemi ile birlikte karma desenli araştırmalar olarak gerçekleştirmesi alan yazına öğretmen uygulamalarının çocuklardaki gelişime etkisini görmek açısından önemli katkılar sağlayacaktır.

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Investigation of the Effectiveness of the Programme Prepared to Support Preschool Teachers

Okul Öncesi Öğretmenlerinin Sınıf Yönetimi Becerilerini Desteklemeye Yönelik Hazırlanan Programın Etkililiğinin İncelenmesi

Tuba Yeşilay Daşıran[1], Çağlayan Dinçer[2]

ABSTRACT

This research is conducted to analyze the efficiency of the training aims to improve skills of classroom management in preschool education. The research group is comprised of 34 preschool teachers work at a preschool belongs to a private institution in Ankara. The teachers attended the research were given "The Classroom Management Skills Inventory for Preschool Teachers" as a pre-test and asked to assess themselves. At the same time, a neutral observer assessed the teachers in the classroom context by using the same inventory Right after the pre-test; the teacher was provided with a training prepared as 8 weeks long. After completing the training, the teachers assessed themselves again the same inventory. The neutral observer also assessed the teachers again using the same inventory after the training was completed. In conclusion; the result has shown that training has a significant consequence on the teachers to develop skills of efficient classroom management.

Keywords;
Preschool Teacher, Effective Classroom Management, Teacher Training.

ÖZ

Bu araştırma, okul öncesi eğitimde etkili sınıf yönetimi becerilerini geliştirmeye yönelik hazırlanan eğitimin etkililiğinin incelenmesi amacıyla yapılmıştır. Araştırma grubunu Ankara ilinde özel bir okul bünyesinde bulunan okul öncesi eğitim kurumunda görev yapmakta olan 34 okul öncesi öğretmeni oluşturmaktadır. Araştırmaya katılan öğretmenlere "Okul Öncesi Öğretmenleri için Sınıf Yönetimi Becerileri Ölçeği" ön test olarak verilmiş ve kendilerini değerlendirmeleri istenmiştir. Eş zamanlı olarak tarafsız bir gözlemci sınıf ortamında aynı ölçek aracılığı ile öğretmenleri değerlendirmiştir. Ön test uygulamasının hemen ardından 8 hafta olarak hazırlanan eğitim paketi öğretmenlere sunulmuştur. Eğitimin tamamlanmasının ardından öğretmenler yine aynı ölçek ile kendilerini değerlendirmişlerdir. Tarafsız gözlemci de yine aynı ölçekle eğitimin tamamlanmasının ardından öğretmenleri değerlendirmiştir. Sonuç olarak, etkili sınıf yönetimi becerilerini geliştirmeye yönelik hazırlanan eğitim, öğretmenlerin etkili sınıf yönetimi becerilerinin geliştirilmesinde önemli bir etkiye sahiptir.

Anahtar Kelimeler:
Okul Öncesi Öğretmeni, Etkili Sınıf Yönetimi, Öğretmen Eğitimi.

Introduction

Students can be helped to gain any principle, rule, behavior, and attitude for social life in a classroom environment most efficiently. Though the smallest and the last item of the education system, the classroom is the first and the main step of educational administration (Burc, 2006). The importance of the classroom, which is the smallest and the most functional

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part of the educational system, cannot be denied in bringing up qualified people. Due to their inclusions, the classrooms comprise written or verbal rules adopted by their individuals, values, beliefs, communication, and continuous relationships. Considering the characteristics of all these relationships; the classrooms are one of the most significant social groups in which people are involved for the longest time. Therefore, teachers must have the knowledge, skills, and attitudes, together with their personal and professional skills, and reflect them on their implementations in the classroom so they can play their expected roles in the classroom environment. The effect of classroom management which regards the classroom as a system of educating and teaching is a commonly accepted idea in the field. Without effective classroom management, one cannot think that children will gain the required behaviors in the classroom environment (Terzi, 2002).

A well-organized classroom can establish effective teaching. Teachers need effective classroom management skills to cope with disruptive students. Prevention of problematic behaviors of those students increases the children's contribution to classroom activities; reduces the possibility of undesirable behavior for which teachers spend most of their energy and time (Türnüklü, 2000). Effective classroom management requires not only cooperating with children for minimizing undesirable behaviors and intervening in them efficiently when encountered but also main maintaining continuity of remarkable academic studies and designing the classroom management system to maximize student engagement (Johnson, 1994).

The biggest problem that teachers face in the classroom during the teaching process is all classroom management. It poses an obstacle for the teachers at the first steps of their careers and the experienced ones. One of the most important conditions to establish an effective teaching environment is classroom management. Teachers need adequate knowledge and skills to manage the class in this sense because no matter how effective teaching-learning activities or program plans areareрehe proficiency of the teacher to implement those programs will affect the outcome. Therefore, teachers must comprehend the main notions and issues in effective classroom management and implement them in the classroom environment.

A teacher without classroom management skills cannot achieve the desired behavior. In a poorly managed class, the child's motivation to learn will not be adequate. Ineffective teaching and learning take place. In this sense, the most crucial role of the teacher is to create a well-organized, supportive, and effective classroom environment (Başar, 2001; Emmer & Stough, 2001; Finger & Bamford, 2010). Also, Denham (2006) emphasized that the educational environment in which teachers organize using knowledge and skills is effective in successfully regulating children's emotional relationships.

The atmosphere created by teachers for an easier learning process has a crucial role in teaching. Preschool education is the first step for children toward school life. It is a critical period in gaining attitudes towards the "school" concept; as it acts as a bridge to primary school. The education process consists of continuous activities; and as students are always with the same teacher with no interruption for a whole day, it is becoming essential for teachers to have effective classroom management skills (Jacobson, 2003). Also, the negative effects of a classroom environment with ineffective management and problematic behaviors must be considered, not only for children but also for teachers. A class difficult to overcome causes teachers to be dissatisfied with their jobs, lead away from professionalism, and feel stressed (U.S Department of Education, 2005). It is crucial to help teachers and equip them with the necessary knowledge and skills to meet the needs of the children while creating a peaceful classroom atmosphere. Effective classroom management studies show that student

success is directly related to a teacher's skills and abilities (Darling-Hammond, 1996). Including the help that the child receives from his teacher to cope with the problems he confronts in class and the new skills, he learns from the teacher when he has a conflict with his classmates. The experiences of this process play an important role in the child's adoption to social and school life. (Şimşek, 2004). Marzano, Marzano, and Pickering's (2003) The Functional Classroom Management and Implications Study showed that the teachers' behavior is of crucial importance. Teachers' actions have twice the importance on child success compared to the school curriculum, testing-assessment methods, and school policies. One cannot deny the importance of discipline and the Teacher's behavior.

In Turkey, studies on developing classroom management skills in preschool education are usually descriptive. In this study, while considering the necessity for training related to the area, we prepared a package and designed the research as an experimental study. Therefore, the preschool teacher can recognize and correct the shortcomings of the dimensions that constitute classroom management to create a more efficient and effective teaching-learning process. This study considers the cornerstones of classroom management. Preschool teachers need support with classroom management because of the change in student profiles over recent years. With this in mind, the research question asked "Does training that aims to develop effective classroom management skills in preschool education affect teachers' classroom management skills?"

The general purpose of this research is to evaluate the effect of training teachers to prepare effective classroom management skills in preschool education. In respect of this, the research item is;

1. Does the training taken by participants make any difference when the teachers self-evaluate their classroom management skills?

2. Does the training taken by participants make any difference when a neutral observer evaluates the teacher's classroom management skills?

3. Are the teachers' self-evaluation pre-test results and the neutral observer's evaluation related? Are the teachers' self-evaluation post-test results and the neutral observer's evaluation related?

Methodology

In this study, among pre-experimental design, the 'One Group Pre-test-Post-test Pattern' was used to measure the effectiveness of preschool teachers' classroom management skills. In order not to face with any problems in the execution of the training program, the teachers of the institution where the researcher is also working were determined as the working group. The Teachers' measures of dependent variables, were obtained by using the same subjects and the same measurement tools as the pre-test and post-test before and after the implementation, relatively.

Sample

The study group involves thirty-four preschool teachers who teach children aged around 5-6 in a private school in Ankara, which gives education to children from upper socio-economic level families.

Table 1

Descriptives of Teachers in Working Group

		n	*%*
Age	Ages between 20-25	13	38,23
	Ages between 26-31	14	41,17
	over 31	7	20,58
Years of Experience	0-5 years	15	44,11
	6-10 years	14	41,17
	15-20 years	5	14,70
The Age Group They Teach	5-year-old group	16	47,05
	6-year-old-group	18	52,94

The table shows that 41.17% of the thirty-four teacher-participants are 26-31 years old, 38.23% are 20-25 years old, and 20.58% were over 31 years old. Most members of the study group are young teachers.

When examining the teacher participants' years of experience, it shows that 44.11% have 0 to 5 years of experience, 41.17% have 5 to 10 years of experience, and 14.70% have 15-yearsrs' experience. It shows that the majority of teachers have up to 5 years of experience.

It shows that of the thirty-four participant teachers, 16 (47.05%) teach the 5-year-age group and 18 (52.94%) teach the 6-year-old group. The rate of the age groups in which teachers educate is close to one another.

Data Collection Tool

The data-collection tools for this study included a 'Personal Information Form,' a 'Needs Analysis Form' and a "Classroom Management Skills Inventory for Preschool Teachers". The "Personal Information Form' inquired about the participant teachers' age, years of experience, the age group they teach and educational background. The "Needs Analysis Form" identified the training topics, and the teachers confirmed their requirements for a seminar to develop their effective classroom management skills. They confirmed which training areas they would like covered and when (on weekdays during working hours, on weekdays after work, or on weekends) under the title of 'Classroom Management Training.'

The 'Classroom Management Skills Inventory for Preschool Teachers,' developed by Dinçer and Akgün (2015), allowed preschool teachers to self-assess their classroom management skills. Five hundred and twenty preschool teachers working in state and private early childhood education institutions took part The inventory used the 5-point Likert-type inventory, across forty items researching effective classroom management skills. Looking at the items in the inventory, the first factor refers to professional skills and the second factor refers to teacher-child interaction. It was determined that the first factor of the inventory consisted of 31 items and the second factor consisted of 9 items. Items (9 items) reflecting negative teacher-child interaction are evaluated by scoring in reverse on the inventory.

It was conducted for the validity study of the developed inventory. For content validity, the inventory was examined by a group of experts in terms of the measurement purpose and whether it represented the content required by this purpose. For this purpose, the inventory, which was prepared after the items were written and reviewed, was presented to the expert opinion of 5 faculty members who teach Classroom Management in Preschool Education

Undergraduate Programs at universities. The experts reviewed the items in terms of whether they measured teachers' classroom management skills and evaluated them in terms of relevance and intelligibility. Items in which at least 3 experts did not express a positive opinion were removed.

While editing the item, considerable attention was paid to designing simple answer codes, without the presence of factual expressions and multiple judgments. The options given for answers: describe me completely (5), mostly (4), partially (3), very little (2), and none (1). A higher total score indicates more positive classroom management. The total score available is between 200 (the most positive) and 40 (the most negative) levels This study evaluated the sub-dimensions of the inventory separately and did not use an overall score.

During the reliability assessment of the inventory, the coefficient of test-retest reliability and the coefficient of Cronbach alpha internal consistency calculated that .83 was the internal consistency coefficient of the 40-question inventory. As for the coefficient of sub-dimensions, .88 is for the professional skills section, and .70 is for the teacher-child interaction section. For the test-retest reliability of the inventory, twenty teachers were selected after the first training and, three weeks later, the second training was completed. According to this result, the coefficient of test-retest reliability was .87 for the professional skills sub-dimension, .83 for the teacher-child interaction sub-dimension, and .91 for the total score. The "Classroom Management Skills Inventory for Preschool Teachers" was concluded to be both valid and reliable.

An neutral observer was included in the study to increase its reliability. An administrator, working in the institution for ten years and believed to make objective evaluations with his thirty-five years of experience was approved as a neutral observer. He made his evaluations by observing all teachers in the study group in a classroom environment based on the inventory prepared for developing effective classroom management skills ("Classroom Management Skills Inventory for Preschool Teachers") and through which teachers evaluate themselves before and after the training session.

Data Collection

As part of the study, the first, the "Classroom Management Skills Inventory for Preschool Teachers" was given to the participants as a pre-test. Researchers assured an appropriate and quiet environment for completing the pre-test and provided the necessary materials (the inventory, an eraser, and a pencil) for the teachers. The teachers were asked to evaluate themselves under the item in the inventory.

The neutral observer also observed each teacher before the training at least twice in the classroom environment for 40 minutes, completed the assessments, and filled out the inventory for each teacher individually.

The Training: Before the training started, the researchers held an informative meeting with the teachers to explain the training process (time, place, content, etc.). In determining the subjects to be covered as part of the training, data was gathered from personal interviews with teachers before the training, and the 'Needs Analysis Forms' were used to identify the areas they must improve. According to the Needs Analysis results, the content of 'The Effective Classroom Management Skills in Early Childhood Education Training' was prepared by establishing the subjects in which the teacher wanted training. The specified topics: Effective Communication, Motivation, and Concentration, Classroom Rules, Discipline, Undesired Behaviors, Their Causes and Management I & II, Anger-Management,

and Teaching Social Skills. Each topic was presented with explanations, stating the aims of the session.

Table 2

Effective Classroom Management Training Program

Week 1	Topic: Effective communication Sub-topics; Effective speaking, effective listening, the relationship between teacher and child, positive language, passive listening and its necessity, reactions that show acceptance, positive messages, etc.
Week 2	Topic: Motivation and Concentration Sub-topics: The meaning of motivation, intrinsic motivation, extrinsic motivation, things to improve intrinsic motivation, in-class motivation strategies; understanding children's interests, etc.
Week 3	Topic: Classroom Rules Sub-topics; The description of classroom rules, qualities of effective rules, teaching rules; tell, model, control and re-model Some methods and techniques to teach rules, etc.
Week 4	Topic: Discipline Sub-topics: The meaning of discipline, aims, and principles, positive discipline; modeling, expressing affection, identifying the cause of negative behavior, natural outcomes, logical outcomes, arranging the environment, etc
Week 5	Topic: Undesired Behaviors, Causes, and Methods I Subtopics: The causes of undesired behaviors in children; genetic, developmental and behaviorist explanations, etc.
Week 6	Topic: Undesired Behaviors, Causes and Methods II Subtopics: Strategies for preventing undesired behaviors; observing children, understanding their interest, increasing their interest in the lesson, etc.
Week 7	Topic: Anger - Management Subtopics: The meaning of anger, its causes, the ways of expressing anger, suggestions for teachers and children to express their anger, teachers' attitudes towards angry children, techniques to cope with angry children
Week 8	Topic: Teaching Social Skills Sub-topics: The meaning of social skills, five characteristics, steps of teaching social skills; modeling, practicing with activities, generalizing the skill, etc.

This training aimed to present detailed information to teachers on classroom management in preschool education and to develop their practical classroom management skills using that knowledge. The researcher introduced the effective classroom management training program to study groups, after getting an expert's opinion. The eight-week training program consisted of 2 hours per each session. Each session included the introduction of theoretical knowledge during the first hour; and a discussion for the next one. The presentation used animation, short films, videos, and photographs to present the information. Teachers asked their

questions during the presentation, and the training took place interactively. The researcher made necessary explanations for teachers. In the discussion session, teachers discussed some of their classroom experiences; they created a controversial atmosphere about the challenging issues they experienced and asked for suggestions from the researcher. The researcher tried to suggest express methods and techniques using the information and experiences he collected.

Data Analysis

The analysis of the data was started by performing a normality test. As a result of the normality analysis, it was determined that the data showed normal distribution (+1.96). According to this result related samples t test is used to assess the efficacy of the program. The t-test is a parametric technique used to test the significance of the difference between the two medians obtained from the two related samples (Büyüköztürk, 2007). The Pearson correlation analysis was used to measure whether there was a relationship between the teachers' self-evaluations and the neutral observer's teacher evaluations. The Pearson correlation is a technique used to describe the relationship between two linear variables (Büyüköztürk et al., 2020).

Results

This section includes results related to the statistical analysis and the data obtained.

The self-evaluation inventory results from researching effective classroom management:

One understands that, for the first sub-dimension of the inventory (professional skills), there is a significant difference between before and after the effective classroom management skills training (t=11,99; p<0,001). The average pre-test score of the first sub-dimension of the inventory (professional skills) was 126.29; the post-test one was 146.97.

For the second sub-dimension of the inventory (teacher-child interaction), there is also a significant difference between before and after the effective classroom management skills training (t=10.09; p<0.0001). The average pre-test score of the second sub-dimension of the inventory (teacher-child interaction) was 21.02; the post-test one was 15.58.

The teacher participants' training results were recorded by the observer's evaluation of effective classroom management skills;

Table 3

T-test Results Showing the Difference Between the Pre-Test and the Post-test Scores of Professional Skills and Teacher-Child Interaction Skills Sub-Dimensions According to the Results of The Classroom Management Skills Inventory for Preschool Teachers (Teacher Evaluation)

Measurement	N	Ortalama	S	sd	t	P
Professional Skills sub-dimension pre-test	34	126,29	14.29	33	11,99	.000
Professional Skills sub-dimension post-test	34	146,97	6,34			
Teacher-child interaction sub-dimension pre-test	34	21,02	2,36	33	10.99	.000
Teacher-child interaction sub-dimension post-test	34	15,58	2,95			

It shows that, for the first sub-dimension of the inventory, there is a significant difference between before and after the effective classroom management skills training (t=17.59; p<0.001). The average pre-test score of the first sub-dimension of the inventory (teacher-child interaction) was 131.44; the post-test one was 153.38.

It demonstrates that, for the second sub-dimension of the inventory, there is another significant difference between before and after the effective classroom management skills training (t=21.16; p<0.001). The average pre-test score of the first sub-dimension of the inventory (teacher-child interaction) was 18.20; the post-test one was 9.82.

When Table 2 and Table 3 are analyzed together, according to the results of both the teachers' self-evaluation and that of the neutral observers, the preschool teacher training, designed to develop their effective classroom management skills, led to a significant difference in their classroom management skills (p<0.001). While the teachers' average score for their professional skills before the training was 126.29, it increased to 146.97 after the training. While the average score for teacher-child interaction was 21.02, it dropped to 15.58 after the training. Also, the neutral observer's evaluations, while the average score for professional skills was 131.44 before the training, it went up to 153.38 after the training. Similarly, teachers' average score for teacher-child interaction skills was 18.20 while it came down to 9.82 after the training. The decline in the average scores in teacher-child interaction was expected because the item related to that skill expressed the wrong applications. This result shows that developing effective classroom management skills training plays an important role in improving teachers' effective classroom management skills.

Table 4

T Test Results Showing the Difference between the Pre-test and Post-test Average Scores of Professional Skills and Teacher-Child Interaction Skills According to the Results of the Classroom Management Skills İnventory for Preschool Teachers (Neutral Observer Evaluation)

Measurement	N	Ortalama	S	Sd	t	P
Professional Skills sub-dimension pre-test	34	131,44	7,54	33	-17,59	.000
Professional Skills sub-dimension post-test	34	153,38	1,51			
Teacher-child interaction sub-dimension pre-test	34	18,20	1,24	33	21,16	.000
Teacher-child interaction sub-dimension post-test	34	9,82	1,91			

There was a high positive correlation between the teachers' self-evaluation pre-test results of their classroom management skills and the neutral observer's teacher evaluation pre-test results (r=0.716, p<0.01).

Table 5

The Relationship between the Results of Teachers' Self-Evaluation of Classroom Management Skills Pre-test and The Neutral Observer's Pre-test Teacher Evaluation

		Teacher pre-test	Neutral Observer pre-test
Teacher Pre-test	Pearson Correlation	1.00	.716
	P	,	.00

	N	34	34
Neutral Observer Pre-test	Pearson Correlation	.716	1.00
	P	.00	,
	N	34	34

There was a moderate positive correlation between the teachers' self-evaluation post-test results of their classroom management skills and the neutral observer's teacher evaluation post-test results ($r=0.472$, $p<0.01$).

Table 6

The Relationship Between the Teachers' Self-Evaluation of Classroom Management Skills Post-test Results and The Neutral Observer's Teacher Evaluation Post-test Results

		Teacher post-test	Neutral observer post-test
Teacher pre-test	Pearson Correlation	1.00	.472
	P	,	.00
	N	34	34
Neutral observer post-test	Pearson Correlation	.472	1.00
	P	.00	,
	N	34	34

When we look at the correlation results, the high relationship between these two-sided assessments before training in the research proves that evaluations are objective.

The moderate relationship between post-training bi-directional assessments also supports the results of the research and its reliability.

Discussion and Conclusion

Effective classroom management skills are essential for teachers. Sabornie & Espelage (2022) stated that supporting classroom management is essential for developing effective teachers. Unfortunately, a lot of teachers feel unprepared for managing their classrooms since they did not obtain enough classroom management training prior to starting their teaching careers (Freeman & Simonsen &MacSuga-Gage, 2013). Taking into consideration this need, this study aimed to evaluate the result of teacher training and the development of effective classroom management skills for early childhood education.

The primary question of the study: Does the training make a difference to teacher participants' self-evaluations from the perspective of effective classroom management skills? According to the results of the study, there has been a positive and significant difference between the pre-test and post-test teachers' self-evaluation results in both professional skills and teacher-child interaction perspectives. This result shows that teachers think they are more able to manage the class after the training. The package involves effective communication, classroom rules, motivation and concentration, discipline, undesired behaviors and their management, anger management, and teaching social skills. It is important in classroom management to establish communication between teacher and child at the desired level. Previous studies (Ryan & Patrick, 2001; İpşir, 2002) indicate that teachers' effective communication skills positively impact behavior management in class, teaching, and academic success. Pianta and Stuhlman (2004) analyzed the relationship between intimacy and conflicting concepts in the teacher-child interaction and the social and academic success of children with four hundred and ninety first-grade students and the impact of the way how teachers of other grades perceive this relationship on success in first grade. The results revealed that the ways how preschool, kindergarten, and first-grade teachers perceive the

relationship they have with the same child in different periods of time are similar and that the quality of this relationship affects both the child's social adaptation and his academic success. During the effective communication presentation, teachers stated they realized that they used child communication barriers often, they became more cautious about not using those barriers after training, and they established more positive relations with children.

Arnold et al. (1998) studied in an institution of early childhood education by observing children in a classroom environment for 15 minutes, and they identified, on average, 49 undesired behaviors of children. They stated that the biggest problem teachers face in the classroom is coping with undesired behaviors. It shows that the undesired behaviors mostly faced during preschool years and not dealt with positively are closely related to problems such as failure, drug addiction, violence, the tendency for crime, and psychiatric disorders seen as they age (Hamre ve Pianta, 2001). According to Ataman (2000), children behave in an undesired way in a classroom environment where effective management skills are not adopted. Taking precautions against undesired behavior is much easier than dealing with it. Therefore, besides the "undesired behaviors and their management" topic, methods for preventing them have also been mentioned as part of the training.

Discipline is another topic handled in the training program. Discipline is a process created for children to get socialized and self-control by gaining the skill to self-evaluate their behaviors so they can realize how they affect themselves and others. It is necessary to guide them to understand and judge why their behavior was wrong and help them to realize the effect of their behaviors both on themselves and others (Manning & Bear, 2002). How to provide discipline in school and class has always been a primary issue for teachers and educators (Tan, 2002). In-class discipline is essential for shaping children with desired habits and behaviors and for maintaining self-control or moral enhancement based on inner control, self-confidence, and respect. Çelik (2005) states that discipline problem and undesired child behavior is steadily increasing in schools, and remarks that the discipline problem with children is regarded as a global matter. In this sense, it is getting more important for teachers to gain knowledge on establishing discipline in class.

The year-long study pursued by Evertson, Emmer, and Anderson (1980), observed twenty-seven classes and discovered that teachers, successful in classroom management, determine the classroom rules and procedures on the first days of school. They spend several days teaching those rules and procedures and revising them constantly. Rules are a good way of preventing possible chaotic and messy situations, and discipline problems in class. In addition to paying attention to the rules, building positive classroom environment is also significant for teachers' classroom management. Woolfolk (2006) emphasizes the importance of teachers' reinforcing positive behaviors and children, considering individual differences, in creating a peaceful atmosphere and preventing problems. Motivation and concentration are crucial for understanding that what is learned is worthwhile and that learning turns into performance. Although many crucial points taken into account to improve the classroom environment one often encounters children who throw temper tantrums and do not know how to control their anger. The teacher helping those children and guiding them toward anger management is significant in preventing destructive emotional effects on both those children and the ones exposed to such behaviors.

Teach social skills to children, and other skills, and provide them with opportunities to use those skills by making meaningful differences in their social lives and contributing to society. Children lacking social skills face many problems in interpersonal relationships, emotional and behavioral areas, and in their school and professional experiences throughout their lives

(Avcıoğlu, 2005). It is necessary for teachers to address these special cases by utilizing their knowledge and skills, and to aim to contribute to the development of social skills.

Akar, Erden, Tor, and Şahin (2010) aimed to identify the experiences of classroom teachers and branch teachers working in kindergartens and primary schools with case study methodology and to determine the needs of teachers regarding classroom management. The study was conducted in Ankara with nineteen teachers. The data was collected through interviews. Because of the analysis, the classroom management approaches of teachers show differences depending on five issues. Those issues came out to be the physical environment, first days in class and motivation, rules and usual in-class procedures, the behaviors distracting the flow of the lesson, and the cooperation between parent-student-school. In this study, which aims to develop effective classroom management skills, the topics covered in the training content are similar to the five classroom management issues highlighted in the mentioned research. In another study, Carlson, Tiret, Bender, and Benson (2011) examined changes in perceptions of preschool teachers' classroom management strategies in the 'Incredible Years Teacher Classroom Management group. Teachers were trained in two groups for 8-10 weeks in 8 sessions, which was 32 hours, and evaluated before and after the training. Twenty-four preschool teachers with the lowest salary and from the region with the highest unemployment rate participated in this study. At the end of the study, it showed there was an improvement in teachers' positive perception of classroom management and its use. This training has five main issues: Motivation, preventing behavioral problems, reducing undesired behaviors, establishing a positive relationship with children, and solving problems. Similarly, this study also has the same issues. In a similar study, Şimşek (2004) investigated 'The Impact of a Group Guidance Program on Teachers' Discipline.' When evaluating the results as a whole, the training program leads to a positive change in teachers' understanding of the rules of discipline. Similarly, in this study, the importance of the relationship between teacher and child under each topic was focused on, and the necessity of positive feeding of teacher-child relationship based on preventing disciplinary problems was emphasized.

The discovery of a meaningful difference in the results of the study reveals that the subjects covered in the training program are the most basic topics. Perhaps the presentation of basic messages, which are given to the teachers during the training, with animations, videos, cartoons, and photographs is helpful in attracting attention to the information to be given and facilitating the attainment of the purpose of education.

Besides this, teachers participating in the research, showing the sensitivity to participate in the whole of the education process, applying the suggested steps effectively, getting prepared for the next topic and contributing to the discussions on the environment, sharing their opinions about the narration or the presentation of the subject, reinforcing their learning after sessions in the classroom have made a significant contribution to the achievement of the implemented training package and a significant difference to teachers.

By including a neutral observer in the research, the study tried to support an objective perspective. The second question analyzed whether the participation of the teacher made a difference when the neutral observer evaluated the teachers regarding effective classroom management skills. When examining the pre-test and post-test evaluations of the observer in the research results, it showed there was a meaningful difference aligned with the teachers' pre-test and post-test evaluations. This result gave us the knowledge that after the training, teachers showed a visible improvement in effective classroom management skills, not only from their viewpoint but also from another viewpoint.

The third research question examined the relationship between the teachers' pre-test inventory self-assessment and the neutral observer's pre-test evaluations and the final test results of the post-test including the neutral observer's evaluations. According to the results of the correlation, it showed there was a high and moderate relationship between the teachers' evaluations and the neutral observer's evaluations. These results, once again, reinforce the reliability and neutrality of the research.

Research results indicate that the training prepared to improve effective classroom management skills has a significant impact on the teachers' development of effective classroom management skills.

Some suggestions about what can be done to improve teachers' effective classroom management skills can be summarized:

- Expand the training to improve teachers' effective classroom management skills to create a Longitudinal Study.
- Training to develop effective classroom management skills can be implemented on teachers who work in public schools and a comparative study can be conducted.
- Follow-up studies can be conducted to determine the long-term effect of the education given to the teachers and to observe the behavior of the teachers when the observer is not in the class environment.

By reducing the number of teachers participating in the research, training can be practical, and proportional to positive or negative changes and each item examined by analyzing the behavior and attitude of each teacher.

Ethics Statement

We declare that there is no conflict of interest between us as the authors and that all researchers contributed to the study. This study does not have an ethics committee report. However, the research was conducted in accordance with all ethical rules. These rules include voluntary participation, informed consent, anonymity, justice, honesty, objectivity, morality, prudence, openness, respect for intellectual property, confidentiality and respect for colleagues.

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