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Validity and Reliability Study of Parental Anxiety Scale Regarding Distance Education

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Abstract

With the COVID-19 pandemic, schools around the world closed their doors in March 2020 and switched to distance learning in response to this public health crisis. This has changed parents' expectations, roles and responsibilities regarding their children's teaching and learning process. In this context, understanding parents' concerns about distance education is important in developing recommendations for similar situations. This article presents some of the results of an online survey exploring parental anxiety regarding distance education. As a result of the analyses, a scale with 23 items and 3 sub-dimensions was created. Factor analysis resulted in following sub-dimensions; Academic success, health, and socialization". Looking at the analysis results obtained, it can be said that the scale can be used to measure parental anxiety regarding distance education. Due to this importance, more comprehensive research should be done to find solutions to parental anxiety about distance education. It is thought that the development of the scale by other researchers and the conduct of qualitative research on this subject will contribute to reducing parental anxiety about distance education. It shows that there is a need to develop recommendations that will provide support to parents and children when the teaching and learning process takes place in an online environment.

Keywords: *distance education, parent, anxiety*

Introduction

With the COVID-19 pandemic, schools around the world closed their doors in March 2020 and switched to distance learning in response to this public health crisis. Distance education is defined as the experience in which the teacher and the learner are apart both in terms of time and place (Keegan, 2002). Distance education, also known as online learning, has become increasingly popular in recent years. To maintain normal education as the world continues to grapple with the COVID-19 pandemic, schools have made efforts to continue schooling through online platforms, written assignments, or a combination of both. In this process, parents have become educators who take on the role of teachers (Daniela et al., 2021; Dong et al., 2020; Günbaş and Gözüdük, 2020; Lau and Lee, 2020; Lee et al., 2021). In this respect, Lemmer (2013) underlines that parents have an important position in education. During the pandemic, parents have played an important key role in supporting students' educational activities (Dong et al., 2020; Griffith, 2020). Similarly, with the transition to distance learning, as with every new approach to education, the distance education process has increased the responsibility of parents to moderate and support their children's education (Altınsoy and Akliman, 2022), and parents, whose role as educators have increased from time to time, have had concerns about the effectiveness and safety of distance education during the epidemic process. (Dong et al., 2020; TEDMEM, 2020). Therefore, it is thought that it is important to identify parents' concerns about distance education and prevent possible problems.

The analysis of the literature showed that there is an increase in studies on distance education (Arslan et al., 2021; Dong et al., 2020; Garbe et al., 2020; Günbaş and Gözüdük, 2020; Lau and Lee, 2020; Zhang, 2021). When the research studies conducted on parents' anxiety about distance education are examined, it is seen that the research is insufficient. Studies have reported that parents observed emotional and behavioral problems (i.e., anxiety, irritability, distractibility) in their children and adolescents due to the pandemic (Spinelli et al., 2020). Research reports that parents' responsibility and involvement in their children's learning is greater in distance education environments than in regular classroom education (Hasler-Waters et al., 2014).

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Parents may worry that their children will not receive the same quality of education through distance learning that they would receive in a traditional classroom. They may be concerned that online classes do not provide the same level of interaction and engagement as face-to-face classes. School-parent cooperation increases students' academic success (Henderson and Mapp, 2002). In this context, according to the results of their research by Altınsoy and Akliman (2022), parents stated that the school plays an important role in increasing the academic success of their children, in the management of educational processes and in strengthening the characters of children with the social relationship network it provides. Another prominent topic is parents' concerns about technical difficulties. Parents were worried that their children would experience technical difficulties such as poor internet connection or software malfunctions during online classes (Garbe et al., 2020; Günbaş and Gözüdük, 2020). Again, the issue of lack of socialization is another topic that comes to the fore. At times, parents have worried that their children will miss important socialization opportunities and about screen time, the amount of time their children spend in front of the screen while learning online. Lau and Lee (2020) stated that lack of interaction and inability to socialize during the distance education process was expressed as an important problem by parents.

Learning at home is challenging, especially for kids with poor motivation, since parents and caregivers may be extremely concerned about their financial future when confined to their homes owing to Covid-19 (Skulmowski & Rey, 2020). A study from Italy investigated the extent to which parents influence their children's well-being during the COVID-19 pandemic. And research results have revealed that parents feel more stressed. According to studies (Jiao et al., 2020; Spinelli et al., 2020), parents have seen emotional and behavioral issues (such as anxiety, impatience, and attention) in their children and adolescents as a result of the epidemic. Research shows that stressful learning environments tend to suppress students' academic abilities, making it necessary to address the emotional needs of both students and parents during this period (Zhang and Sapp, 2008). Long-term and ongoing stressors may be the new normal, and parents are likely to face longer-term stress and mental health deterioration (Davis et al., 2021).

With the Covid 19 pandemic, schools across the country closed their doors in March 2020 and started education via distance education. Along with distance education, efforts are being made to continue education with the help of online platforms and printed resources. While the fight against public health continues, many factors in education have been overlooked. Especially families have had to take more responsibility in distance education. During the process, families are expected to guide educational activities, create content for individual teaching, meet the social and emotional needs of the student, and overcome technical problems encountered during distance education.

Even though the inspiration for the present study is the period of Covid 19 and its negative effects on parents' well-being especially their anxiety about distance education and the learning process of their children, it will not be wrong to note that parental anxiety still continues. The value of parental involvement in education and the ways that parental anxiety about a child's education can affect parents and children alike continues to attract attention in the field of education (i.e. Wu et al., 2022; Amalia et al., 2023; Mei at al., 2023; Simmons et al, 2024; Tekel et al., 2024).

As stated in Wu et al. (2022) anxious parents may find it hard to control their expectations for their kids' education. Parents might be concerned about giving their kids access to enough educational resources for their growth and about whether their kids are learning enough to live up to their expectations. While learning is the primary goal of students, parents' concerns are mostly focused on their kids' academic performance. Parents might be concerned about their kids' performance, habits, and motivation for learning, for instance. Additionally, a decrease in positive parenting behavior and an increase in negative parenting behavior were linked to parents' negative emotions. As a result, these worries are detrimental to kids' education and could put more pressure on them to learn, which could lead to academic burnout.

Parents are among the many parties involved in the education process and have a significant impact on their children's academic achievement. However, anxiety related to children's education is a common experience for parents, and it is typified by unpleasant feelings like worry, panic, and nervousness (Wu et al., 2022). Anxiety about education on the part of parents is not constant and can change in response to a number of variables, including the child's academic standing, the competitive nature of education, and social development and transformation (Chen et al., 2022).

From a similar point of view Mei et al. (2023) stated that empirical evidence suggests that excessive or inappropriate anxiety on the part of parents during their children's education has a negative impact on the academic performance of the children as well as their physical and mental health.

In another much recent study, Tekel et al. (2024) developed a parental anxiety scale for the parents' of gifted children with the similar concern.

In the light of the above literature review, it will not be wrong to claim that anxiety and stress situations experienced in families cannot be assessed within the frame of a specific

historical period. The possible negative effects of emotional states such as anxiety and stress and their probable effects on children and their education continues to grab attention. For this reason, it is of great importance to detect families' anxiety during some significant periods such as the distance education process. In this context, this study aimed to develop a standardized scale to determine the anxiety levels of families regarding distance education.

Methodology

Research Design

The research method used is the survey model. With survey model, the purpose is to reveal the attitudes of the research group (Fraenkel et al., 2006). This study is a scale development study.

Participants

The participants of the research consisted of a total of 885 parents. The sample was obtained using the random sampling method. The inclusion criterion for parents in the study is that they have children attending distance education in kindergarten, primary school, secondary school or high school. Details about the participants are given in table 1.

As seen in Table 1, it shows that 75.9% (n = 670) of the parents in the sample of this study were female and 24.1% (n = 213) were male. When the age distribution of the parents was examined, 5.5% (n = 49) was 20-29 years old, 54.4% (n = 480) was 30-39 years old, 36% (n = 318) was 40-49 years old and 4.1% (n =36) It seems that he is 50 years old and above. It was determined that 53.3% (n=471) of the parents were working in any job, and 46.7% (n=412) were not working in any job. It is seen that 10.6% (n=155) of the parents have children in kindergarten, 35.9% (n=527) in primary school, 39.3% (n=576) in secondary school, and 14.2% (n=208) in high school.

Data Collection Procedure

The scale form was created electronically and delivered to parents whose children were receiving distance education via link links. Parents filled out the created scale form online. Parents' participation in the study was voluntary and their consent was obtained before filling out the questionnaire. The 54 parents who did not give consent were allowed to leave the study without seeing the questions. The time to fill out the scale was calculated as approximately 10 minutes. The data collection process started in December of the 2020-2021 academic year. The data collection process lasted 60 days and 885 parents were reached during this process.

Scale Development Process

The aim of the research is to develop a scale to determine parents' concerns about distance education. For this purpose, firstly, an item pool consisting of 32 items was prepared by scanning the relevant literature. The draft scale form has a 5-point Likert structure and is rated as Strongly Disagree (1), Partially Disagree (2), Undecided (3), Agree (4), Strongly Agree (5).

Data Analysis

SPSS 22.0 package program for Exploratory Factor Analysis (EFA) was used in the analysis of the research data. Before starting the data analysis, the resulting data set was examined for missing, incorrect and extreme values after the data was transferred to the SPSS 22.0 package program. KMO (Kaiser-Meyer Olkin) value was examined for sample adequacy and

Table 1: Demographic Information about Participants

Variables	*Groups*	*n*	*%*
Gender	Female	670	75.9
	Male	213	24.1
Age	20-29	49	5.5
	30-39	480	54.4
	40-49	318	36.0
	50 >	36	4.1
Employment	Employed	471	53.3
	Unemployed	412	46.7
Type of School	Kindergarten	155	10.6
	Primary School	527	35.9
	Secondary School	576	39.3
	High School	208	14.2
Total		1466	100

Bartlett's Sphericity Test values were examined for sample size. After determining the suitability of the research data for factor analysis, Exploratory Factor Analysis (EFA) was performed on the data to provide evidence for the construct validity of the measured feature based on the relationships between the items of the scale. Using these several significant superstructures to explain the measurement, EFA is an analysis technique that seeks to identify and cluster items that measure the same structure or quality among the items selected by the researchers (Tabachnich and Fidell, 2001). Cronbach's alpha (Crα) internal consistency coefficients were checked to provide evidence of the reliability of the scale.

Research Ethics

For the implementation of the study, written permission was received from the Ethics Committee of XXX University dated 21.05.2018 and numbered 79394. In addition, after the parents participating in the study were informed about the purpose and method of the study, each of them was asked to fill out an informed consent form.

Findings

This section includes exploratory factor analysis findings regarding validity and reliability studies.

Validity of the Scale

KMO value was calculated to determine whether the data was suitable for factor analysis. When the KMO value is greater than .60, factor analysis can be performed on the data (Özdamar, 2013). The KMO value can be between 0 and 1; Between 0.50 and 0.70 is interpreted as normal, between .70 and .80 as good, between .80 and .90 as very good, and above .90 as excellent (Field, 2005). In the study, the KMO value was found to be .95. This result shows that the data obtained from the sample is suitable for factor analysis. Additionally, Bartlett's Test of Sphericity was performed to determine whether the data distribution was suitable for factor analysis. Bartlett Test of Sphericity was found to be statistically significant ($\chi 2=11165.686$; df: 253; p=.000). As a result, KMO value and Bartlett Sphericity Test results revealed that the data of the study were suitable for factor analysis (Field, 2005; Büyüköztürk, 2008).

Findings Regarding Exploratory Factor Analysis

Based on the correlations between the scale's components, exploratory factor analysis (EFA) was performed on the data to demonstrate the construct validity of the feature being measured. In this context, the EFA results performed to test the construct validity of the scale are as follows. In the analysis, it was seen that the 23-item scale was collected in 3 factors with eigenvalues higher than 1 (Figure 1).

Three dimensions have eigenvalues greater than 1, as Table 2 illustrates. It can be seen that the eigenvalues of the first, second, and third dimensions are 8.98, 1.88, and 1.49, respectively. First, the first dimension accounts for 43.16% of the scale's total variance, followed by the second dimension at 8.52% and the third dimension at 5.48%. Following

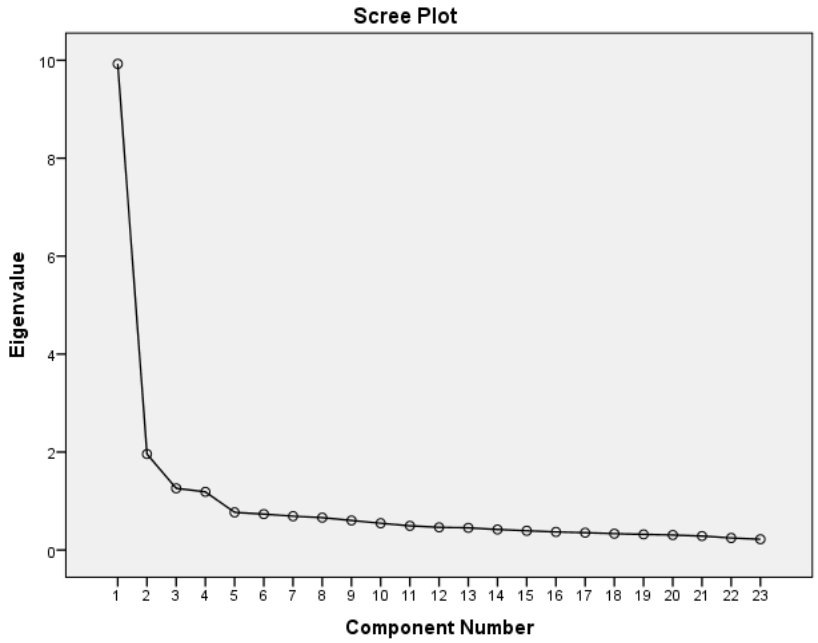

Figure 1. Scree Plot

Table 2. Eigenvalues, % of Variance Explained, and Cumulative Proportion of Total Variance from Principal Components Analysis

	Eigenvalues			*After Varimax Rotation*		
Factors	*Total*	*% of Variance Explained*	*% of Cumulative Variance*	*Total*	*% of Variance Explained*	*% of Cumulative Variance*
1	9.93	43.16	43.16	5.05	21.95	21.95
2	1.96	8.52	51.68	4.96	21.55	43.50
3	1.26	5.48	57.16	3.14	13.66	57.16

Table 3: EFA Findings

	Factors			
Items	*1*	*2*	*3*	R^2
M2	.669			.426
M5	.665			.545
M6	.764			.519
M7	.643			.683
M8	.736			.513
M10	.773			.636
M25	.512			.448
M26	.595			.665
M31	.692			.671
M1		.573		.646
M11		.750		.616
M12		.755		.392
M13		.582		.515
M14		.558		.622
M15		.629		.673
M17		.741		.579
M16		.759		.370
M18		.693		.667
M9			.595	.742
M21			.462	.728
M22			.733	.491
M23			.772	.438
M24			.747	.561
Eigenvalues	5.049	4.957	3.141	
% of variance explained	%21.951	%21.553	%13.657	
% of cumulative variance	%21.951	%43.504	%57.161	
the Kaiser–Meyer–Olkin Test			.950	
Bartlett's Test	$\chi 2$=11165.686; sd: 253; p=.000			

Varimax rotation, the first dimension accounts for 21.95%, the second for 21.55%, and the third for 3.14% of the scale's overall variance. Following the varimax rotation, these three dimensions account for 57.16% of the scale's variance.

Values for the factor load should not overlap at the.10 level and should be.32 or higher. Item load values of.32 were used when choosing the items for this scale (Tabachnick and Fidell, 2001). Overlapping items (3,4,5,15,19,20,27,28,29,30,32) were eliminated from the scale in this particular situation. Table 3 provides values for item factor loadings and the items that fall under which dimension. Table 3 provides the loading values of the items that belong to each dimension as a result of EFA.

According to Table 3, the 23-item scale is organized into three dimensions. The load values of the 9 items that comprise the first dimension are shown to be between.51 and.77. It can be seen that the load values of the items in the second dimension range between.55 and.75. It can be seen that the third dimension has 5 items with factor loading values ranging from.46 to.77.

Findings Regarding Item Analysis and Reliability

Item-total correlations, interdimensional correlations, and Cronbach's alpha coefficient calculations were used to assess the designed scale's reliability. Every scale item's item-test total correlations were looked at. Table 4 displays the dimensions' item-total correlation values and Cronbach's alpha coefficient.

As a result of the analysis, Cronbach's alpha coefficients are .90 for the first factor ("Academic achievement"), .89 for the second factor ("health") and .82 for the third factor ("socialization"). Cronbach's alpha coefficient for the sum of all dimensions of the scale was determined as .94. Considering that the reliability coefficient is quite reliable in the range of .80-1.00 (Akgül and Çevik, 2003). The findings reveal that the entire scale and its sub-scales are highly reliable. The correlation coefficients among factors are shown in Table 5.

When Table 5 is examined, it is seen that the correlation coefficients among the factors created in the scale vary between .630 and .889. It was concluded that there is a low,

Table 4. Item-Total Correlations and Cronbach Alpha Reliability Coefficients

Factors	*M*	*SS*	*Item-test Total Correlations*	*Cronbach's Alpha coefficient when item is removed*
1st Factor (α = .90)				
M2	3.77	1.21	.642	.886
M5	3.34	1.41	.626	.887
M6	3.48	1.43	.757	.876
M7	2.84	1.49	.615	.888
M8	3.68	1.32	.713	.881
M10	3.27	1.43	.729	.879
M25	3.63	1.33	.606	.888
M26	3.02	1.50	.581	.891
M31	3.03	1.54	.675	.883
2nd Factor (α = .90)				
M1	3.66	1.22	.545	.893
M11	3.69	1.32	.722	.875
M12	4.09	1.13	.679	.880
M13	3.79	1.29	.662	.881
M14	2.89	1.52	.563	.892
M15	3.01	1.50	.675	.880
M16	3.97	1.19	.664	.881
M17	3.77	1.32	.740	.873
M18	3.23	1.48	.712	.876
3rd Factor (α = .82)				
M9	3.44	1.43	.514	.815
M21	2.81	1.51	.467	.830
M22	3.07	1.48	.671	.770
M23	3.63	1.37	.725	.756
M24	3.24	1.46	.719	.755

Table 5. Correlation Coefficients Among Factors

Factors	1st Factor	2nd Factor	3rd Factor	Total
1st Factor	1	.630**	.635**	.889**
2nd Factor	.630**	1	.654**	.885**
3rd Factor	.635**	.654**	1	.832**
Total	.889**	.885**	.832**	1

p< .01 **

medium and high level relationship between the factors and that the three factors are not independent of each other.

Discussion, Conclusion and Implications

Distance education, also known as online learning, has become increasingly popular in recent years. Studies on families' anxiety levels regarding distance education contain findings showing that families are concerned about the quality of education, academic success, isolation and lack of socialization (Bettinger and Loeb, 2017). In this respect, families' anxiety levels regarding distance education constituted the main problem of this research. Within the

framework of this problem, a literature review was conducted regarding families' concerns about distance education. In the development studies of the parental anxiety scale regarding distance education, the literature on this subject was scanned and an item pool of 32 items was created regarding parental anxiety regarding distance education. As a result of the analysis, a scale with 23 items and 3 sub-dimensions was created. In this study, a standardized scale was developed to determine the anxiety levels of families regarding distance education. As a result of the validity and reliability study of the parental anxiety scale regarding distance education, three dimensions emerged. As a result of the factor analysis, these sub-dimensions were named "academic success, health and socialization". As a result of the analysis, it was seen that the scale items could explain 43.16% of the total variance. The factor loadings of the items ranged between .462 and 773. In addition, the distinctiveness of the scale items was found to be high. . The reliability of all items and 3 sub-dimensions of the scale was examined with Cronbach's alpha, Spearman Brown and Guttman reliability tests. All reliability values were above .8. Finally, the total scale scores and correlation values between sub-dimensions were also examined and the unidimensionality and unidimensionality of the scale were examined. It has been determined that it has multidimensionality.

Considering the analysis results obtained, it can be said that the scale can be used to measure parental concerns about distance education. Parental anxiety regarding distance education can be used to identify the concerns of parents, who form the pillar of education, and take precautions in this regard. Due to this importance, more comprehensive research should be conducted to find solutions to parental concerns regarding distance education. It is thought that the development of the scale by other researchers and the conduct of qualitative research on this subject will contribute to reducing parental concerns about distance education.

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