

| Research Article / Araştırma Makalesi |

Impact of COVID-19 in Turkey: Views of Parents on the Development, Behavior of Their Children with Autism and Self-Efficacy Perceptions¹

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Keywords

1. Autism
2. Behavior
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Abstract

Purpose: The aim of this study was to develop scales to determine the self-efficacy perceptions of parents of children with autism spectrum disorder (ASD) and their views on the developmental and behavioral problems of their children with ASD during the coronavirus disease (COVID-19) pandemic.

Design/Methodology/Approach: This study used a relational screening model; data were collected online from 390 parents. The research conducted in the relational screening model has two stages; The first stage is the development of three separate scales that will enable the determination of the self-efficacy perceptions of parents who have children with ASD during the COVID-19 pandemic, and the development and behavioral problems of their children with ASD through parental views. The second stage is the relationship of the scores obtained from these scales with each other and the comparison with various variables.

Findings: Based on parental views, the findings of this study showed that stereotypic and self-injurious behaviors of children with ASD increased, while their communication, social interaction, daily living, and self-care skills were negatively affected.

Highlights: Despite these results, most parents reported considering themselves moderately, very, or completely competent in behavior management, application of different teaching methods and techniques, as well as skill/concept teaching during the COVID-19 pandemic.

Öz

Çalışmanın amacı: Bu çalışma, COVID-19 salgını sırasında otizmlı çocuğu olan ebeveynlerin öz-yeterlik algılarını ve otizmlı çocuklarının gelişim ve davranış sorunlarına ilişkin görüşlerini belirlemeye yönelik ölçekler geliştirmeyi amaçlamaktadır.

Materyal ve Yöntem: Bu çalışmada ilişkisel tarama modeli kullanılmıştır; veriler 390 ebeveyninden çevrimiçi olarak toplanmıştır. İlişkisel tarama modeli kullanılarak yürütülen bu araştırma iki aşamalıdır. Birinci aşama, COVID-19 pandemisi sürecinde otizmlı çocuğu olan ebeveynlerin öz-yeterlik algılarının ve otizmlı çocuklarının gelişim ve davranış sorunlarının ebeveyn görüşlerine dayalı olarak belirlenmesini sağlayacak üç ayrı ölçeğin geliştirilmesidir. İkinci aşama ise bu ölçeklerden alınan puanların birbirleriyle ilişkisi ve çeşitli değişkenler ile karşılaştırılmasıdır.

Bulgular: Ebeveyn görüşlerine dayalı olan bu çalışmanın bulguları, otizmlı çocukların stereotip ve kendine zarar verme davranışlarının arttığını, iletişim, sosyal etkileşim, günlük yaşam ve öz bakım becerilerinin olumsuz yönde etkilendiğini göstermiştir.

Önemli Vurgular: Bu sonuçlara rağmen ebeveynlerin bir çoğu COVID-19 pandemisi sürecinde davranış yönetimi, farklı öğretim yöntem ve tekniklerini uygulama ve beceri/kavram öğretimi konularında kendilerini orta düzeyde, çok ya da tamamen yeterli gördüklerini belirtmişlerdir.

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INTRODUCTION

Autism spectrum disorder (ASD) refers any one of a group of disorders with an onset typically occurring during the preschool years and characterized by difficulties with social communication and social interaction and restricted and repetitive patterns in behaviors, interests, and activities (American Psychiatric Association, 2013). Supporting the social interaction and communication skills of individuals with ASD and reducing their inappropriate behaviors require implementing specially developed teaching programs. Continuous and intensive face-to-face implementation of these programs by teachers, parents, or other support personnel (e.g., psychological counsellor, para-professional) is critical for developing individuals with ASD. However, national or international extraordinary situations (e.g., wars, pandemics) prevent individuals with ASD from receiving continuous and face-to-face education (Stenhoff et al., 2020). The Coronavirus disease 2019 (COVID-19) pandemic, which was first detected in December 2019, is one of these extraordinary situations. The COVID-19 pandemic has adversely affected the whole world, including children with ASD and their parents, in many aspects, especially health and education (Alhuzimi, 2021; Bellomo et al., 2020).

To reduce the negative effects of the pandemic and prevent the spread of COVID-19, measures for social isolation have been taken worldwide (Uresin et al., 2021). These measures include "stay at home" themed curfews, travel restrictions, and the closure of sports halls, restaurants, and educational institutions where social events are held (Fong et al., 2021). The closure of educational institutions adversely affected the lives of many students and parents, including students with special needs, and caused a significant education crisis worldwide. It is estimated that there are approximately 1.6 billion students in more than 190 countries worldwide. In other words, 94% of the world's student population does not attend school, so their education is interrupted (United Nations Educational, Scientific and Cultural Organization, 2022). Educational services were provided to all students and their parents through distance education during the closure period due to the COVID-19 pandemic (Hosokawa et al., 2021). In distance education, many countries generally prefer technology-supported applications. In countries such as China, Greece, Algeria, and Saudi Arabia, distance education has been provided from educational content websites, education portals, social media accounts, or video-sharing sites opened for students' use (Bozkurt et al., 2020). TV broadcasts were also made in many countries to support students without internet access.

Shortly after the closure of schools due to the COVID-19 pandemic in Turkey, education services were provided to all students through distance education. Undoubtedly, the distance education process has been difficult for all students and their parents, but considering the effects of ASD on human life, this process has been more difficult for children with ASD and their parents (Stenhoff et al., 2020; Wang et al., 2021). Students with ASD are among the most vulnerable groups during long-term social isolation and quarantine (Fontanesi et al., 2020; Spinelli et al., 2020). Limited social interactions during the pandemic and behavioral problems due to changes in routines make it difficult for individuals with ASD to adapt to their environment (Jussila et al., 2020). The services provided by the Ministry of National Education of Turkey to individuals with ASD and special needs, including their parents, during the distance education process are listed as follows: (a) parents can stay with their children at home, both as a TV channel broadcast and through web portals on the education information network, (b) a digital library was established for teachers and parents, (c) the "ozelimegitimdeyim" mobile application has been developed to provide educational videos for teaching academic, daily life, communication skills, and social skills, and (d) a "Special Education and Guidance Services Information Line" call center was established (Ministry of National Education, 2020; Tekin-Iftar et al., 2021). It is thought that it is of critical importance to determine the extent to which children with ASD and their parents benefit from education services in the distance education process and what effects the education they receive on their lives in terms of influencing the measures that can be taken regarding the education of children with ASD in similar pandemics that may occur in the future.

Although different countries have used similar technological applications in the distance education process, the dynamics, technology access, socio-economic conditions, and cultural characteristics of the countries differ. In this context, it is thought that it is important to evaluate the opinions and thoughts of children with ASD and parents living in each country about the process separately. A limited number of studies have been conducted to examine the views and opinions of parents regarding the distance education services provided to children with ASD and their parents during the COVID-19 pandemic in Turkey. It has been observed that the findings differ in these studies (Bozkus-Genc & Sani-Bozkurt, 2022; Cetin & Ercan, 2021; Senol & Can Yasar, 2020). In these studies, parents stated that distance education has both positive and negative effects on their children and themselves. Parents reported spending more quality time with their children during the distance education process, engaging in activities such as cooking together and studying (Bozkus-Genc & Sani-Bozkurt, 2022; Senol & Can Yasar, 2020). They also highlighted improved communication with school personnel, increased access to information from the school, and the ability to support their children's development. These findings demonstrated that the increase in motivation positively affected parents (Cetin & Ercan, 2021). Parents have indicated that their children's participation in the lesson, learning to meet their own needs, and acquiring some daily life skills through the course content are among the positive effects of distance education on their children (Bozkus-Genc & Sani-Bozkurt, 2022; Cetin & Ercan, 2021; Senol & Can Yasar, 2020).

Parents stated that their workload increased and they experienced feelings of anxiety, burnout, and strain as negative effects of distance education on them (Bozkus-Genc & Sani-Bozkurt, 2022; Cetin & Ercan, 2021; Senol & Can Yasar, 2020). They view the computer as a means of entertainment, which can lead to their children getting distracted, not fully understanding the lessons, forgetting what they have learned, showing disinterest in studying or listening, struggling with homework, spending excessive

time on the Internet, disobeying, throwing tantrums, and displaying aggressive behaviors (Bozkus-Genc & Sani-Bozkurt, 2022; Cetin & Ercan, 2021; Senol & Can Yasar, 2020).

Various studies have been conducted in the literature to determine how children with ASD and their parents are affected by the COVID-19 pandemic during the social isolation process (Althiabi, 2021; Alhuzimi, 2021; Fontanesi et al., 2020). These studies focused on the emotional states of parents with children with ASD and their perspectives and observations regarding their children's behaviors. According to the findings, parents reported a general increase in stress, anxiety, fear, and depression, which had a negative impact on their psychological well-being (Althiabi, 2021; Alhuzimi, 2021; Fontanesi et al., 2020). Gender differences in social isolation during the pandemic were also examined in some studies. In one study, fathers reported that they had more opportunities to spend time with their children, compared to the pre-pandemic period, as a result of the imposed curfews. They also mentioned increased communication with their children (Meral, 2022). However, other studies found that mothers experienced higher levels of depression and anxiety during the COVID-19 lockdown compared to fathers (Miniarikova et al., 2022; Wang et al., 2021). Additionally, Althiabi (2021) found that mothers sought more psychological support than fathers during the social isolation period. The higher levels of depression and anxiety experienced by mothers, as well as their increased need for psychological support, can be attributed to the fact that mothers often bear the primary responsibility for the personal care of their children with ASD. In the literature, there is a limited number of studies examining the relationship between the educational status of parents and their child's development, behavior, and perception of parental self-efficacy in the COVID-19 pandemic (Miniarikova et al., 2022; Nithya et al., 2021). Nithya et al. (2021) did not find a significant relationship between the education level of parents and the behavior of their children with ASD. Similarly, Miniarikova et al. (2022) did not find a significant relationship between the education level of mothers and their anxiety and depression levels.

In studies examining the views and opinions of parents on behavioral problems and characteristics observed in their children with ASD, such as sleep problems and limited repetitive behaviors, parents generally mentioned the negative effects of their children staying at home all the time (Colizzi et al., 2020; Corbett et al., 2021; Fong et al., 2021; Hosokawa, 2021; Manning et al., 2021; Mutluer et al., 2020; Scarselli et al., 2022; Turkoglu et al., 2020). These studies have shown that children's behavioral problems, including aggression, hyperactivity, and hypersensitivity, tend to increase (Colizzi et al., 2020). Additionally, children are negatively affected by changes in routines, exhibit limited repetitive behavior features more frequently and more intensely than before the pandemic (Hosokawa et al., 2021), and experience sleep disorders (Fong et al., 2021; Manning et al., 2021). However, different findings were obtained in some studies. For instance, in a study by Meral (2022), parents reported that their children with ASD increased their verbal behaviors and improved their self-care skills as a result of parental interaction. Similarly, in a study investigating sleep disorders in children with ASD, parents stated that there were improvements in the sleep quality of their children during the pandemic (Scarselli et al., 2022). On the other hand, in another study, parents mentioned that they do not know why and how their children with ASD experience stress (Hosokawa et al., 2021).

In the literature, it has been stated that further research involving a larger number of participants is needed to determine the changing behavioral characteristics of children with ASD during the COVID-19 pandemic, based on parental views and thoughts (Hosokawa et al., 2021; Scarselli et al., 2022). Considering the limited number of studies and participants involved, it can be concluded that more research is necessary to examine the positive and negative aspects of how the distance education process affects children with ASD and their parents. Previous literature includes studies that separately examined parents' views and opinions on the development/behaviors of their children with ASD or their perceptions of parental efficacy during the COVID-19 pandemic (Colizzi et al., 2020; Di Renzo et al., 2020; Hosokawa et al., 2021). However, this study differs from others in the literature as it investigates both parents' views on the development/behaviors of their children with ASD and their perceptions of parental efficacy together.

In addition to determining parents' perceptions of competence in the social isolation process implemented during the pandemic, it is important to conduct a study that reveals parents' views and opinions regarding the developmental and behavioral challenges experienced by individuals with ASD. This research will contribute to understanding how special education support should be provided to children with ASD and their parents during similar pandemic situations that may arise in the future.

Purpose of the Present Study

The aim of this study was to develop scales to determine the self-efficacy perceptions of parents with children with ASD and their views on the development and behavioral problems of their children with ASD during the COVID-19 pandemic. Additionally, the study aimed to compare and correlate the factors in the developed scales with each other. To achieve this, the study sought answers to the following research questions:

1. Are the scales of self-efficacy perception of parents with children with ASD in Social Isolation (EPCA), Developmental Problems of Children with ASD in Social Isolation (DPCA) and Behavioral Problems of Children with ASD in Social Isolation (BPCA) valid measurement tools?
 - a. What is their content validity?
 - b. What is their construct validity?
2. EPCA, DPCA, and BPCA are the scales reliable measurement tools?
 - a. What are internal consistency coefficients?

b. What are item-total score correlations?

3. Does the perception of parental self-efficacy differ according to gender, age, and education level during the COVID-19 social isolation process?
4. Do the development and behavioral problems of children with autism differ according to the children's ages during the COVID-19 social isolation process?
5. Do the development and behavioral problems of children with autism differ according to the perception of parental self-efficacy during the COVID-19 social isolation process?
6. What are the views of parents on the development, behavioral problems, and self-efficacy perceptions of their children with ASD during the social isolation process implemented in the COVID-19 pandemic?

METHOD

Relational screening model was used in this study. The research conducted in the relational screening model has two stages; The first stage is the development of three separate scales that will enable the determination of the self-efficacy perceptions of parents who have children with ASD during the COVID-19 pandemic, and the development and behavioral problems of their children with ASD through parental views. The second stage is the relationship of the scores obtained from these scales with each other and the comparison with various variables. In the relational screening model, the change of two or more variables together or the degree of this change is tried to be determined (Karasar, 2014).

Working Group

A total of 190 parents, 10 for the pre-trial application, 100 for the trial application, and 80 for the confirmatory factor analysis (CFA) to apply the resulting factor structures, participated in the research in the first stage of the scales development. In the second stage, data were collected from 200 parents after the scales were developed. In order to determine the participants, data were collected online from mothers or fathers who were eligible for the condition of having a child with ASD, using criterion sampling, one of the purposive sampling techniques. In criterion sampling, individuals, events, or situations with specified conditions are selected, and those who meet the criteria are included (Buyukozturk et al., 2014). The demographic information of all participants is presented in Table 1.

Table 1. Demographic information of participants

	Gender	Age						Education						Child's Age						Total
		Fe.	Ma.	19-29	30-39	40-49	50+	P.S.	M.S.	H.S.	J.C.	U.G.	G.	0-3	4-6	7-10	11-14	15-20	21+	
Pre-trial	F	10	-	3	4	2	1	3	-	2	2	3	-	1	1	6	1	-	1	10
	%	100	-	30	40	20	10	30	-	20	20	30	-	10	10	60	10	-	10	100
Trial	F	53	47	2	49	30	19	10	8	27	8	42	5	8	33	27	18	7	7	100
	%	53	47	2	49	30	19	10	8	27	8	42	5	8	33	27	18	7	7	100
CFA Imp.	F	40	40	5	28	31	16	7	6	22	8	27	10	6	22	23	11	11	7	80
	%	50	50	6	35	39	20	9	8	28	10	34	13	8	28	29	14	14	9	100
Study 2	F	113	87	10	87	67	36	19	15	52	19	78	17	16	67	54	30	19	14	200
	%	57	44	5	44	34	18	10	8	26	10	39	9	8	34	27	15	10	7	100

P.S.:Primary School, M.S.:Middle School, H.S.:High School, J.C.:Junior College, U.G.:Under Graduate, G.:Graduate

Steps Followed in the Development of Scales

The methods used to develop a new measurement tool are listed below:

1. By paying attention to which questions will be evaluated by the subject to be measured, the literature on the subject is scanned.
2. The format required for the measurement (such as ordering, classification, and equally spaced) is determined, and a question/item pool is created.
3. After the question/item pool is created, opinions from field experts are taken for content validity.

4. The sampling application determined for the preliminary test of the draft form obtained from the expert opinion is made.
5. After this stage, the validity and reliability analyzes of the scale are made, and the measurement tool is finalized (Karakoc & Donmez, 2014).

Data Collection Tools

Demographic Information Form

The researchers developed this form to determine the demographic characteristics of the participants, data on age, gender, marital status, educational status, age of the child, support mechanisms used in the development of the child, and how the child spends his time at home were collected.

The Scale of Developmental Problems of Children with Autism in Social Isolation (DPCA)

The scale developed by the researchers consists of one dimension and five items. The scale's items, which has a five-point likert structure, are answered as "I strongly disagree - I slightly agree - I agree moderately - I agree very much - I completely agree." The scale was developed for parents with children with ASD. The items of the scale, which can be scored in total, are calculated by reverse coding, and a minimum of 5 and a maximum of 25 points are obtained. The high score obtained from the scale means that the child with ASD has no problems related to developmental areas.

The Scale of Behavioral Problems of Children with Autism in Social Isolation (BPCA)

The scale developed by the researchers consists of 4 single-dimensional items. The items of the scale, which has a five-point Likert structure, are "I strongly disagree - I slightly agree - I agree moderately - I agree very much - I completely agree." It was developed for parents with children with ASD. The total scale items that can be scored are calculated by reverse coding, and a minimum of 4 and 20 points are taken. A high score indicates that the child with ASD does not experience behavioral problems.

Self-Efficacy Perception Scale of Parents of Children with Autism in Social Isolation (EPCA)

The scale developed by the researchers to determine the self-efficacy perceptions of parents with a child with ASD consists of 5 items in one dimension. Scale items with a five-point Likert structure are "I strongly disagree - I slightly agree - I agree moderately - I agree very much - I completely agree." A minimum of 5 and a maximum of 25 points are taken from the scale items that can be directly scored without reverse coding. A high score means that the parents of children with ASD have high competencies. The validity and reliability calculations of these three scales developed by the researchers are explained in detail in the findings section.

Analysis of Data

First, the content, construct validity, Cronbach's Alpha (α) internal consistency reliability coefficients, and item-total score correlations were calculated for the validity and reliability studies of the developed scales. Opinions were received from field experts to determine content validity; For construct validity, after exploratory factor analysis (EFA), confirmatory factor analysis (CFA) was performed to confirm the resulting factor structure. After these analyses, the t-test, one-way analysis of variance (One-Way ANOVA), and multiple linear regression analyses were applied to the data collected for the second phase of the research. All collected data were analyzed with IBM SPSS 21 and LISREL 8.71 programs.

FINDINGS

The findings of the study are presented under two different headings. The first is the title of "Study 1" which includes the validity and reliability analyzes of the scales developed within the scope of the research. The other is the "Study 2" subheading, which includes analyzing the data collected from different participants with these scales.

Study 1

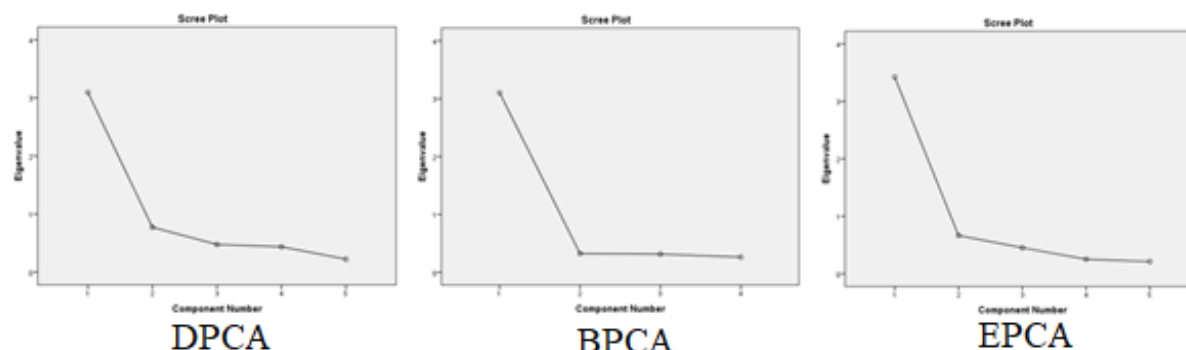
Preliminary Analysis

First, it was checked whether all the scales met the prerequisites for EFA compliance, such as missing data, extreme values, normality, and sample size (Cokluk et al., 2014). This prerequisite was met as there was no missing data in the data set. The multivariate normality of the data was examined with the Barlett test, according to which the chi-square (χ^2) value was found to be significant at the .01 level. When the kurtosis and skewness coefficients were examined, the average of the items of the DPCA, BPCA, and EPCA scales was ± 1.5 (Tabachnick & Fidell, 2014) was found to provide univariate normality. For the sample size, Tavsancil (2019) stated that the number of items in the scale should be at least five times; Bryman & Cramer (2001) state that 5 or 10 times would be sufficient. Considering that it consists of 5 items on DPCA, four on BPCA, and five items on EPCA, it is thought that the sample size (N=100) for EFA is sufficient. To test this, Kaiser-Meyer-Olkin (KMO) values should be above .05. If this value is higher, the data set is suitable for EFA; 0.9-Excellent; 0.8-Very good; 0.7-Good; 0.6-Medium; 0.5-Weak (Sharma, 1996). When these values were analyzed for DPCA, BPCA, and EPCA, it was determined that they were .81, .85, and .85, respectively.

Validity Analysis

After it was determined that the three scales developed by the researchers met the assumptions required for factor analysis, in each EFA, only one item with Developmental Problems (5 items), Behavior Problems (4 items), and Parental Efficiency (5 items) was determined for the DPCA, BPCA, and EPCA scales, respectively. Factored structures. It is seen that the breaking point in the screen plots for the factor numbers obtained indicates a single-factor structure (Figure 1).

Figure 1. Line charts



A high score indicates that the child with ASD does not experience behavioral problems. Self-efficacy Perception Scale of Parents of Children with Autism in Social Isolation (EPCA). The scale developed by the researchers to determine the self-efficacy perceptions of parents with a child with ASD consists of 5 items one dimension. Scale items with a five-point Likert structure are “I strongly disagree - I slightly agree - I agree moderately - I agree very much - I completely agree.” A minimum of 5 and a maximum of 25 points are taken from the scale items that can be directly scored without reverse coding. A high score means that the parents of children with ASD have high competencies. The validity and reliability calculations of these three scales developed by the researchers are explained in detail in the findings section.

Principal components analysis, one of the most preferred factorization techniques, was applied. This analysis aims to extract the maximum variance from the data set with each component. At the same time, researchers who want to reduce a large number of variables to fewer components use this method (Cokluk et al., 2014). As a result of the analysis, single-factor structures with an eigenvalue above one were obtained. The total variance explained by the scales was 62% for the DPCA, 78% for the BPCA, and 68% for the EPCA. Since rotation is not possible for single-factor structures, rotation is not performed in these analyses. The factor loading values of the scales and the standard variance rates they explained are given in Table 2.

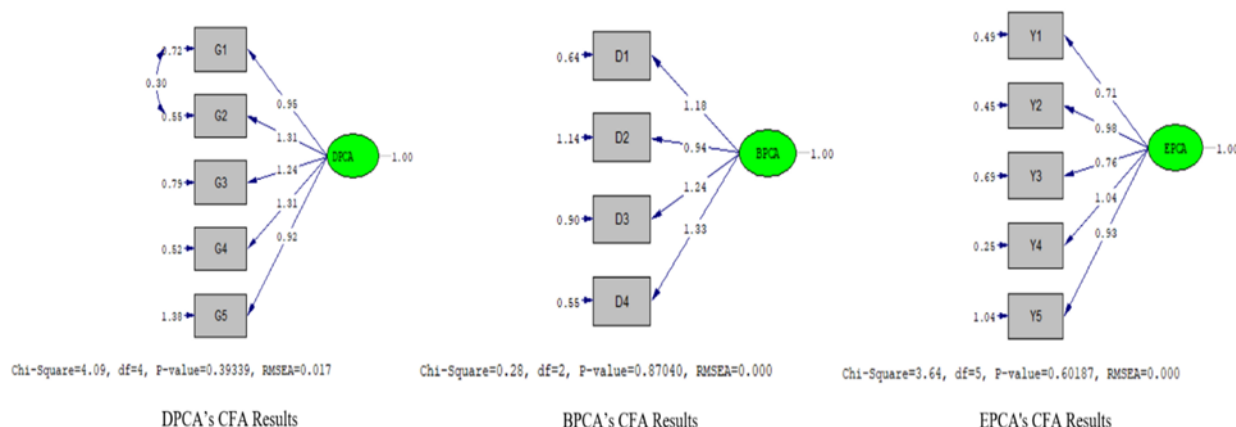
Table 2. Factor load values and common variance values of the scales

Scale	Item	Common variance	Factor
DPCA	G1	.67	.89
	G2	.79	.82
	G3	.66	.82
	G4	.67	.81
	G5	.32	.57
BPCA	D1	.80	.89
	D2	.78	.89
	D3	.77	.87
	D4	.76	.87
EPCA	Y1	.75	.90
	Y2	.77	.88
	Y3	.81	.86
	Y4	.66	.81
	Y5	.44	.67

When the acceptance point of the factor loading values is accepted as .30 (Pituch & Stevens, 2016), it is seen that no item is below this value. In Table 1, the DPCA scale consists of five one-dimensional items, and factor load values range from .57 to .89. The single dimension of the BPCA scale consists of 4 items. Its factor load values range from .87 to .89. Finally, the EPCA scale consists of 5 single-dimension items. Factor load values vary between .67 and .90. Cokluk et al. (2014) stated that if the explained standard variable rate is less than 10%, there would be a problem in terms of related items. However, when the explained common variances were examined, it was determined that there was no problem with any of the items on the scale. It is seen that item G5, with the lowest score of .32 in the DPCA, explained 32%, item D4, with the lowest score of .76 in the BPCA, 76%, and item Y5, which had the lowest score of .44 in EPCA, explained 44% common variance. CFA was applied with data collected from 80

participants to verify the structures in the scales reached at the end of EFA. As seen in Figure 2, all three models tested are first-order structural models. They consist of one latent variable, each representing DPCA (Developmental Problems) with five observed variables, BPCA (Behavioral Problems) with four variables, and EPCA (Parental Self-Efficacy) with five variables.

Figure 2. CFA results for three scales



As a result of this analysis, t-values indicating the agreement between the observed variables were found to be significant at the .01 level and above 2.56 for all scales. In addition, it was determined that the error variances were between .23 and .62 in the DPCA, between .24 and .56 in the BPCA, and between .19 and .55 in the EPCA; that is, they were not high. For this reason, no variables were excluded from the analysis. With CFA, statistical results indicating the degree of fit of the data structure to the model are obtained; these are called fit indices. By testing all variables simultaneously with fit indices (Stevens, 2009), the researcher uses the model to evaluate whether it explains the relationships between the observed variables and the latent variable (Stapleton, 1997). If the model does not match, it is rejected; if it does, the model is not rejected, and it is decided that the relationships that explain the causal structures are represented (Bentler, 1980). The values of the fit indices of the scales are shown in Table 3.

Table 3. Fit indexes and breakpoints for scales

Scale	Fit Indices							
	χ^2/sd	RMSEA	SRMR	GFI	AGFI	CFI	NFI	NNFI
DPCA	1.02	.02	.02	.98	.92	1	.99	1
BPCA	0.14	0	.01	1	.99	1	1	1
EPCA	0.73	0	.03	.98	.95	1	.99	1
Breakpoint	≤ 2 =perfect fit ¹	$\leq .05$ =perfect fit ²		≥ 0.95 =perfect fit ³	≥ 0.90 =good fit ⁴			

¹(Tabachnick & Fidell, 2014); ²(Brown, 2015); ³(Sumer, 2000); ⁴(Hooper et al., 2008)

When the fit indices of the three different models created according to this are examined, it can be stated that a perfect fit is achieved. It is seen that only the AGFI (Adjusted Goodness of Fit Index) value of the DPCA scale fits well, while all other indexes provide a perfect fit. As a result of EFA and CFA applied to the scales within the scope of construct validity, it was found that each scale consisted of a single factor structure.

Reliability Analysis

Reliability is concerned with accurately measuring the feature a measurement tool will measure. There are two issues in reliability; The first is the consistency of the scores taken from the same measurement tool at different times, and the other is the consistency between the answers taken at the same time. At the same time, the internal consistency between the item scores of the measuring instrument is determined by Cronbach's Alpha (α). This calculated reliability coefficient is expected to be .70 and above. Another reliability analysis in Likert-type rating scales is the item-total score correlation calculated with the Pearson correlation coefficient. Generally, a correlation value of .30 and above means that the items distinguish people well (Buyukozturk, 2015). The Cronbach's Alpha (α) reliability coefficients for the scales were calculated as .84 for DPCA, .90 for BPCA, and .88 for EPCA. The item-total score correlations were found to be between .43 and .78 for the JWGSA, between .77 and .80 for the BPCA, and between .53 and .81 for the EPCA.

Study 2

Investigated whether the average parental self-efficacy perception scores obtained by applying the scales with proven validity and reliability to different participants differ according to gender. The independent samples t-test report regarding the EPCA scores of the parents of children with ASD is presented in Table 4.

Table 4. T-Test results of perception of parental self-efficacy scores by gender

Gender	N	\bar{X}	S	sd	t	p
Female	113	16.66	4.67	198	2.93	.004
Male	87	14.68	4.84			

Accordingly, the self-efficacy perception scores of the parents show a significant difference according to gender $t(198)=2.93$, $p<.01$. The self-efficacy perceptions of mothers ($\bar{X}=16.66$) were higher than those of fathers ($\bar{X}=14.68$). To determine the effect size, the Cohen d value was calculated and found to be .42. This value indicates that the difference between the mean scores of the mothers and fathers in EPCA is about .42 standard deviation.

The results of the single-factor analysis of variance ANOVA, which was performed to determine whether the parent's perception of self-efficacy scores during the COVID-19 social isolation process differ according to age, are given in Table 5.

Table 5. ANOVA results of perception of parental self-efficacy scores by age

Age	N	\bar{X}	S	F	p
19-29	10	17.08	4.40	.362	.780
30-39	87	15.83	4.65		
40-49	67	15.46	5.32		
50-59	36	16.00	4.52		

According to these results, the self-efficacy perceptions of parents do not show a statistically significant difference according to age, $F(3, 196)=.362$, $p>.05$. Table 6 shows the results of the ANOVA test to determine whether there is a significant difference between parents' perception of self-efficacy scores during the COVID-19 social isolation process according to their education level.

Table 6. ANOVA results of perception of parental self-efficacy scores by education level

Education	N	\bar{X}	S	F	p
Primary School	19	16.89	4.32	.644	.667
Middle School	15	16.73	6.14		
High School	52	15.85	5.13		
Junior College	19	16.32	6.20		
Undergraduate	78	16.03	4.33		
Graduate	17	15.80	3.79		

When the results are examined, there is no significant difference between parents' perceptions of their self-efficacy in the COVID-19 social isolation process and their education level, $F(5, 194)=.644$, $p>.05$. The results of the ANOVA test to determine whether the development and behavioral problems of children with ASD show a significant difference according to age during the COVID-19 social isolation process are given in Table 7.

Table 7. ANOVA results of developmental and behavioral problems scores by age

Scale	Child's age	N	\bar{X}	S	F	p
DPCA			15.56	6.97	.485	.787
			16.90	6.25		
			15.56	5.91		
			16.13	4.70		
	0-3	16	17.32	5.70		
	4-6	67	15.64	7.38		
	7-10	54	13.00	5.32		
	11-14	30	13.45	5.00		
BPCA	15-20	19	11.09	4.90	1.54	.179
	21+	14	13.17	4.98		
			13.84	6.48		
			12.50	6.06		

When Table 7 is examined, according to the views of the parents participating in the research, there is no significant relationship between the development of children with ASD at the age of $F(5,194)=.485$, $p>.05$, and between behavioral problems and the ages of $F(5,194)=1.54$, $p>.05$.

In Table 8, multiple regression analysis results are presented to determine whether there is a significant difference between the development and behavioral problems of children with ASD and parents' perception of parental self-efficacy during the COVID-19 social isolation process.

Table 8. Multiple regression analysis results on the prediction of parents' perception of self-efficacy with developmental and behavioral problems of children with autism

Model	B	Standard Error	β	t	p	R ²	F _(2, 197)
Stable	9.86	.95		10.39	.000		
Developmental Problems	.30	.06	.38	4.76	.000	.18	22.834
Behavior Problems	.08	.07	.09	1.08	.28		

As seen in Table 8, a significant regression model included $F(2, 197)=22.834$, $p<.001$, and 18% ($R^2_{adjusted}=.18$) ASD' of parental self-efficacy perception (dependent variable) in the COVID-19 social isolation process. It was found that the independent variables explained the developmental and behavioral problems of children with schizophrenia. Accordingly, there is a statistically significant relationship between the developmental problems of children with ASD and the perception of parental self-efficacy, $\beta=.38$, $t(197)=4.76$, $p<.001$, $pr^2=.10$. On the other hand, there is no statistically significant relationship between the behavioral problems of children with ASD and the perception of parental self-efficacy, $\beta=.09$, $t(197)=1.08$, $p>.05$. Finally, the frequency and percentage values of the participants' responses to the items of each scale are given in Table 9.

Table 9. Frequency and percentage values of scale items

Scale	EPCA										DPCA										BPCA							
	Y1		Y2		Y3		Y4		Y5		G1		G2		G3		G4		G5		D1		D2		D3		D4	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%	F	%
1 (strongly disagree)	14	7	16	8	11	6	23	12	38	19	40	20	49	25	46	23	45	23	29	15	50	25	29	15	48	24	52	26
2 (slightly agree)	36	18	38	19	34	17	44	22	29	15	31	16	23	12	22	11	16	8	13	7	25	13	20	10	29	15	36	18
3 (moderate)	78	39	64	32	66	33	75	38	58	29	54	27	38	19	40	20	49	25	41	21	40	20	25	13	34	17	41	21
4 (agree)	41	21	53	27	48	24	35	18	32	16	31	16	34	17	26	13	29	15	32	16	39	20	37	19	36	18	21	11
5 (completely)	31	16	29	15	41	21	23	12	43	22	44	22	56	28	66	33	61	31	85	43	46	23	89	45	53	27	50	25
Total	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100	200	100

DISCUSSION

This is the first study in the literature in which three separate measurement tools, namely DPCA, BPCA, and EPCA, have been developed and used together based on the opinions of parents with a child with ASD during the COVID-19 pandemic. However, there are also different studies in the literature in which the views and opinions of parents about the development/behavior of their children with ASD or their perceptions of self-efficacy in the COVID-19 pandemic are examined separately (Colizzi et al., 2020; Di Renzo et al., 2020; Hosokawa et al., 2021). The findings obtained in the studies conducted in the literature support some of the findings of this study (Colizzi et al., 2020; Di Renzo et al., 2020; Hosokawa et al., 2021; Nithya et al., 2021). In our study, when parents' views on the behavior of their children with ASD were examined, they stated that children's stereotyped, obsessive, and problem behaviors increased. In the study of Colizzi et al. (2020), parents stated that their children with ASD exhibited more intense and more frequent problem behaviors during the social isolation process due to the pandemic. In another study, parents stated that the stereotyped behaviors of their children with ASD increased more during the social isolation during the COVID-19 pandemic than before COVID-19 (Hosokawa et al., 2021). This increase in stereotyped behaviors of individuals with ASD due to the COVID-19 pandemic may be because the COVID-19 pandemic is not adequately understood by individuals with ASD and may be associated with individuals with ASD spending more time at home compared to the pre-pandemic period (Hosokawa et al., 2021). The measures taken for social isolation during the COVID-19 pandemic revealed the need for parents to organize intervention programs, expert support in behavior management, health services, and daily activities for their children with ASD. For this reason, it is thought that it may be essential to make some advance plans for possible COVID-19 and similar pandemic periods in the future. For example, Parent education programs can be developed for possible closure periods due to pandemic.

It is also seen that some of the findings from this study differ from those of some studies in the literature. Most parents who participated in the study stated that social isolation during the COVID-19 pandemic negatively affected the receptive and expressive language skills, daily life, and self-care skills of their children with ASD. In another study, which was different from these findings, most of the parents stated that the social isolation process during the COVID-19 pandemic positively affected the language and communication skills and daily living skills of their children with ASD, and they had fewer problems in coping with the difficulties their children experienced (Kaku et al. et al., 2021). Among the reasons why parents reported positive opinions about their children with ASD and had fewer problems during the COVID-19 pandemic; It has been shown that parent members have the opportunity to spend more time with their children (Kaku et al., 2021; Meral, 2022), parents face fewer problems because they travel less with their children, and children do not have to adapt to different environments (Kaku et al., 2021).

Considering the divergence of the findings in the studies, it can be thought that it may be essential to conduct more studies that reveal the views of parents with children with ASD about the development and behavior of their children during the social isolation process in COVID-19 or similar pandemics. In this study, when the findings regarding the parents' perception of competence in the social isolation process applied in the COVID-19 pandemic were examined, 38% of the parents stated that they considered themselves moderately competent in applying different teaching methods and techniques, and 30% stated that they considered themselves very or completely competent. The findings of this study were conducted by Mumbardo-Adam et al. (2021), in which parents with children with ASD developed new methods by applying visual aids and new technologies to organize daily routines or leisure activities during the COVID-19 pandemic and to teach new skills during the quarantine process. is supportive. Another result we obtained in this study regarding parents' perception of efficacy was that 39% of the parents considered themselves moderately efficacious and 37% considered themselves very or completely efficacious in teaching skills and concepts. Contrary to this view expressed by parents, in the study of Nithya et al. (2021), only 4% of parents stated that they

were able to teach new skills to their children with ASD, that they had difficulty in controlling their children's behavior and that they needed one-on-one expert support during the pandemic. It is thought that the differentiation of parents' opinions and thoughts and the obtaining of different findings in different studies may be related to the level of being affected by the autism of their children with ASD. Parents of individuals with autism-specific behavioral characteristics may need more support in managing their children's behavior or supporting their development. Therefore, this situation may affect parents' perception of self-efficacy. It is thought that it would be essential to conduct more research on COVID-19 or similar pandemics and to examine the issue from different dimensions by using measurement tools that determine the extent to which children with ASD are affected by autism in future studies.

This study may have limitations in some respects. First, in this study, the impact of the COVID-19 process on the development and behavior of children with ASD was determined solely based on the views of parents. In further research, the effect of the COVID-19 pandemic process on the development and behavior of children with ASD can be obtained from other Parent members (siblings, etc.), teachers of the child with ASD, or people in their immediate surroundings (friends, close relatives, language and speech therapist, etc.) can be examined with the opinions received.

Secondly, in this study, the views of parents on the development of language, daily life, social interaction, and motor skills of their children with ASD, their behaviors (stereotype, harmfulness, adherence to routines, obsessions), and perception of self-efficacy were examined. Further studies can be planned to determine what parents do to support the development of their children with ASD or how they spend time with their children. Third, in this study, the development, behaviors, and self-efficacy perceptions of parents who have children with ASD during the social isolation process in the COVID-19 pandemic were examined based on parental opinion. However, no training was given to the parents, and the effectiveness of any education program was examined. In future studies, the results of this measurement tool, which was developed within the scope of an experimental research model, can be examined by examining the effectiveness of a parent education program that will be developed to increase the development of their children with ASD (language and communication skills, daily life skills), behavior management and self-efficacy perceptions during similar pandemic periods.

CONCLUSION

The study found that three scales were developed to determine the development of children with ASD, behavioral problems, and the self-efficacy perceptions of parents with children with ASD. Parents to whom these scales were applied stated that the social isolation process during the COVID-19 pandemic increased the stereotype and inappropriate behaviors (e.g., obsessions) of their children with ASD, and negatively affected their communication, daily life and self-care skills. Despite these results, parents generally stated that they considered themselves competent in behavior management, applying different teaching methods and techniques, and teaching skills/concepts. Based on these results, it is thought that it may be important to determine the factors that are thought to cause negative developments in their children with ASD based on the opinions of the parents during the social isolation process in the COVID-19 pandemic and to provide the parents and their children with ASD with the support that may be related to these factors.

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Statements of publication ethics

I/We hereby declare that the study has not unethical issues and that research and publication ethics have been observed carefully.

A.K. conceived of the presented idea. H.F.T developed the theory and performed the computations. M.K and E.A. verified the analytical methods. A.K. encouraged H.F.T and M.K. to investigate and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

Researchers' contribution rate

The study was conducted and reported with equal collaboration of the researchers.

Ethics Committee Approval Information

After the meeting numbered 2022/62 held on 28.06.2022, it was decided by unanimous vote that this research would be ethically appropriate with the decision of the Hakkari University Scientific Research and Publication Ethics Committee with the document date and number number 01.07.2022-31714.

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