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Development of the Parental Knowledge-Attitude Scale for children's use of digital devices: a methodological study*

Mehmet Bulduk[1], Veysel Can[1], Fatma Güdücü Tüfekci[2]

[1]Department of Nursing, Faculty of Health Sciences, Van Yüzüncü Yıl University, Van, Turkiye
[2]Department of Child Health, Diseases and Nursing, Faculty of Nursing, Atatürk University, Erzurum, Turkiye

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ABSTRACT

Aims: This study focuses on creating a comprehensive scale to measure parents' knowledge and attitudes about children's digital device use and rigorously examining its validity and reliability to ensure its effectiveness.

Methods: The study was designed and conducted using a methodological approach. A 43-item question pool was created for the Parental Knowledge-Attitude Scale for children's use of digital devices. After receiving expert opinions on the items and conducting a pilot study, the number of items was reduced to 19. A field study was conducted for the 19-item scale. The research was carried out in the pediatric clinics of a university training and research hospital between February and March 2023. The universe of the study consisted of parents (n=416) whose children between the ages of 6 months and 6 years were hospitalized in the pediatric clinics of the specified hospital for any reason between the specified dates, and who did not have any chronic diseases or psychological problems, and who were open to communication and cooperation. The study was conducted with the entire population without using the sampling method. Statistical analysis of the data was performed using SPSS and AMOS software. The statistical significance level was accepted as 5%. Ethical principles have been adhered to.

Results: It was determined that the obtained data were suitable for factorization and the sample size was sufficient. Exploratory factor analysis was performed to discover construct validity. The number of factors was decided according to the eigenvalue criteria, explained variance, and scree plot graph. Scale items had 3 components and there was a significant correlation among them. The total variance explained by the factors was 61.3%. The total score average of the scale was 75.95±10.7 and the reliability Cronbach alpha coefficient was 0.979. The item discrimination method was used for the internal consistency of the scale, it was determined that each item distinguished the measured phenomenon and was statistically significant ($p<0.001$). Exploratory factor analysis revealed a latent construct, and to confirm and strengthen its validity, a subsequent confirmatory factor analysis was conducted. The analysis results obtained were found to be within the good fit [CMIN/df: 1.679; RMSEA: 0.04; SRMR: 0.045; CFI: 0.978; AGFI: 0.925; NNFI (TLI): 972], acceptable fit (NFI: 0.947; GFI: 0.946; RFI: 0.934; PNFI: 0.759; PGFI: 682) according to the fit measurement table and were lower than the AIC, CAIC and ECVI values of the compared model.

Conclusion: A three-dimensional, 19-item scale, which is 5-point Likert-type and tested for validity and reliability, was developed to measure parents' knowledge and attitudes toward children's use of digital devices.

Keywords: Child, digital devices, parent, pediatric nurse

*The data from this study were presented as an oral presentation at the 4th International Mediterranean, 3rd International, and 8th National Pediatric Nursing Congress, held in Erzurum, Turkiye, on June 1-3, 2023.

INTRODUCTION

New technologies such as mobile and interactive display media have taken hold of a young child's daily life.[1] While electronic devices have revolutionized learning, communication, and the dissemination of information, it has been shown that screen media has long-term negative effects on children's health, which is a concerning issue from a public health perspective.[2-4] The World Health Organization (WHO) and the American Academy of Pediatrics (AAP) recommend limiting screen time for children aged 2-4 years to a maximum of one hour per day. They further highlight that this time should focus on educational content and be supervised by a responsible adult.[5] AAP strongly discourages any screen exposure for children under the age of two.[6]

However, touchscreen devices are often used as "electronic babysitters" to calm or soothe crying or restless babies.[7] Over the past two decades, it has been reported that screen time has doubled in children aged 0-2 years.[8] Previous findings have indicated that increased screen time may contribute to various

Corresponding Author: Mehmet Bulduk, mehmetbulduk@yyu.edu.tr

physical and mental health challenges, including a heightened risk of obesity, sleep disturbances, depression, diminished self-esteem, and reduced academic achievement.[9-11]

While today's children can quickly adapt to technology as digital natives, some parents may struggle to cope with this speed because they lack the necessary technical skills.[12] Especially during the coronavirus pandemic, curfews/lockdown and virtual education, affected children's developmental processes, and digital worlds offered an alternative environment for play and interaction.[12,13] It was noted that when parents were doing housework or busy with something, they used mobile devices to calm their children, put them to sleep, or distract them, as well as preferred them for rewarding, punishment, and behavior management purposes.[14] Research carried out in Turkiye revealed that parents encouraged children under the age of 2 to use screens and digital devices, often employing these devices to distract children under 5, particularly during mealtimes.[15] The existing literature predominantly focuses on the negative effects of digital devices on child development. However, there is a significant gap in scales designed to assess parental knowledge and attitudes toward digital device use during early childhood. Studies on digital parenting have primarily targeted older age groups (>6 years) and have not thoroughly addressed parents' knowledge levels and guidance roles. For instance, the scale developed by İnan Kaya et al.[16] focuses on parents of children aged 6-18 years. Similarly, another study in Turkiye evaluated the attitudes of parents of 6th and 7th-grade students toward the use of information and communication technologies.[17] To date, no scale has been developed to assess parental knowledge and attitudes regarding digital device use in children aged 6 months to 6 years.

This study aims to develop the first valid and reliable scale specifically designed to evaluate parental knowledge and attitudes toward digital device use in children aged 6 months to 6 years. Understanding the health implications of digital device exposure during early childhood and increasing parental awareness are essential for both child development and public health. According to the literature, more than 90% of children are introduced to digital devices between the ages of 6 and 12 months, with an average daily screen time of approximately 2 hours.[18] Unless parental attitudes shift, children's exposure to digital devices is likely to increase as they grow older. Therefore, focusing on early childhood represents a critical opportunity to mitigate the adverse effects of screen exposure and promote effective parental guidance. This study not only provides a robust tool to assess parental knowledge and attitudes toward digital device use during early childhood but also lays the foundation for evidence-based advancements in digital parenting strategies.

METHODS

Ethical Procedure

Approval for the study was granted by the Atatürk University Faculty of Nursing Ethics Committee (Date: 15.02.2023, Decision No: 2023-1/13). The development of the scale adhered to the ethical guidelines outlined in the Helsinki Declaration. Informed consents were obtained from every participant before the surveys.

In ensuring the scale's validity, its development process and steps were meticulously carried out following the guidelines outlined in the literature.[19,20] A diagram of the scale development process is given below (**Figure 1**).

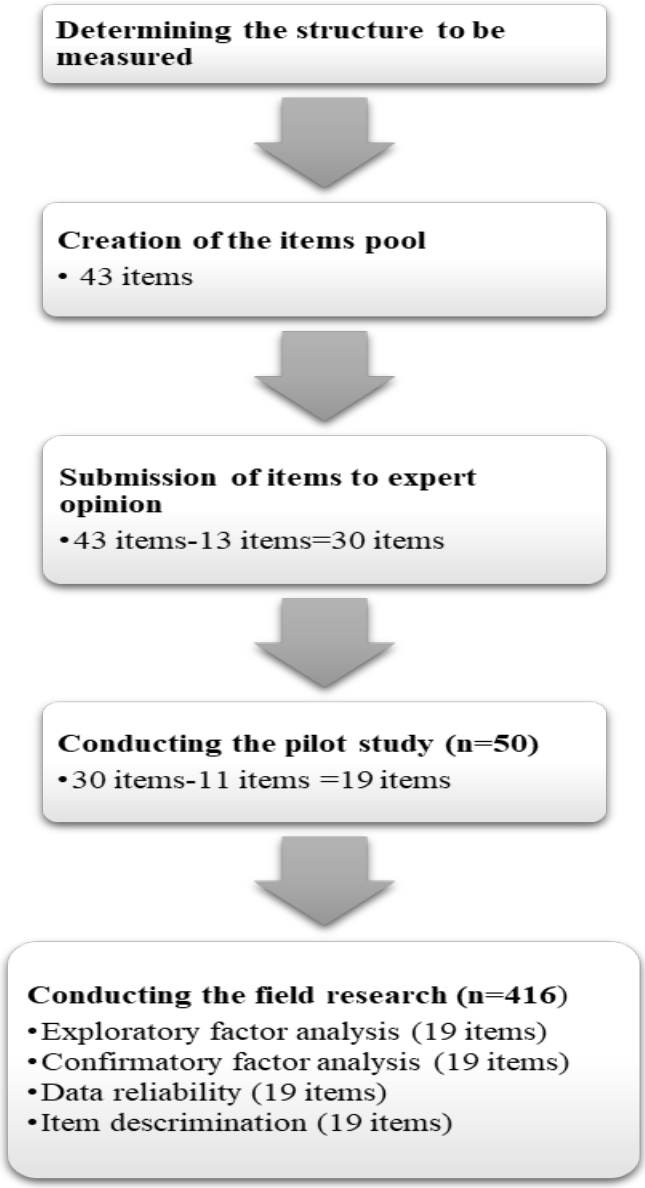

Figure 1. The scale development process

The structure to be measured: In the modern era of rapid technological advancements, digital devices have become integral to the lives of children, alongside individuals of all age groups.[21] Prolonged use of digital devices during childhood may adversely impact various aspects of development, including cognitive, physical, emotional, and social growth.[22] At this point, parents' attitudes towards their children's use of digital devices play an important role.[14] The structure to be measured through the scale is to determine parents' knowledge and attitudes regarding their children's use of digital devices.

Creation of the items pool: Two ways were followed to create the item pool.[23] A comprehensive literature review was initially performed, and relevant sentences were revised and incorporated into the item pool. Secondly, the information obtained from interviews with specializers was itemized. Consequently, a preliminary pool comprising 43 items was established.

Obtaining expert opinions: To ensure content validity, 10 subject-matter experts were consulted to determine the extent to which each item accurately represented the intended construct.[24] The draft scale items were sent to academicians and professionals specialized in pediatric nursing, child health, child development, measurement, and evaluation. Experts were asked to evaluate whether the prepared items were appropriate in terms of language, content, and scope and whether they measured the implicit phenomenon.[25]

Feedback reports from 10 experts were evaluated according to the Lawshe technique.[24] According to the technique, the content validity ratio for each item was examined and it was understood that the items had a content validity between 0.54 and 1.00. The content validity criterion value for 10 experts is 0.62 at the 0.05 significance level.[25] Thirteen items had a score below 0.62. It was observed that these 13 items overlapped in meaning with other items. As a result of expert evaluation, 13 items with a score below 0.62 were removed from the item pool.

The content validity ratio (CVR) of the remaining 30 items ranges from 0.76 to 1.00, which is above the critical value of 0.62. The content validity index (CVI) rate calculated for all 30 items is 0.82 and has a score above 0.60.

Conducting the pilot study: The 30-item draft scale was evaluated through a pilot study.[26] The scale's applicability, comprehensibility, and technical suitability were tested in this pilot study.[27] The pilot study involved 50 parents of children aged between 6 months and 6 years who were regular users of digital devices.[28] Of those who participated in the pilot study, 50% (n=25) were mothers and 50% (n=25) were fathers.

The pilot study data were analyzed using statistical methods. The draft scale, comprising 30 items, demonstrated a reliability coefficient (α) of 0.76, with item-total correlation coefficients ranging from 0.28 to 0.69. Three items with low correlation coefficients were excluded from the draft scale.[27] It was determined that removing these items would increase the reliability coefficient to 0.80.

In addition, exploratory factor analysis (EFA) was conducted on the pilot study data to explore underlying latent constructs. The first component of the scale has 10 items, the second component has 6 items, and the third component has 3 items. The remaining 8 items were excluded from the draft scale because they overlapped with other scale items.[29]

As a result, 11 items were removed from the draft scale with 30 items due to the low correlation coefficient of 3 items and overlapping problems of 8 items. Thus, the number of draft scale items was refined to 19.

Conducting Field Research to Test the Draft Scale in a Large Sample Group

Statistical procedure: The data of the study were analyzed using SPSS 26 and AMOS 24 statistical package programs. In the tables; sample size (n), percentage (%), mean and standard deviation (X±SD), statistical significance (p), large (>) and small (<), chi-square (X^2) were shown. For the normality test, the kurtosis and skewness values of the data were taken as basis, if this value was between -1.5 and +1.5, it was accepted that the data set provided a normal distribution.[30] Cronbach's Alpha coefficient (α) was used for reliability tests.[31] Since the test conditions were met, an independent sample T test was applied.[32] Pearson's correlation coefficient was used in correlation analyses.[33] It was understood that the obtained data provided the necessary conditions for exploratory and confirmatory factor analysis.[34] Analysis results were evaluated within the 95% ($p<0.05$) confidence interval determined for social sciences.[31]

Questionnaire: A structured questionnaire was developed to evaluate the draft scale, incorporating both a personal information section and the preliminary scale items. Each participant's response to the items was measured on a 5-point Likert Scale, spanning from strongly disagree to strongly agree.

Participants: The research was carried out in the pediatric clinics of a university training and research hospital between February and March 2023. The study population comprised parents (n=416) of children aged six months to six years who were hospitalized in the pediatric clinics of the designated hospital during the specified timeframe. These parents had no chronic illnesses or psychological disorders and were willing to engage in communication and collaboration. The research was carried out with the entire population without using the sampling method. According to scale development literature, the sample size is recommended to be between 300-400 people[28] and in this study, the sample size was 416.

67.3% of the participants were mothers and 32.7% were fathers. 26.9% of the participants were in primary school, 21.6% were in secondary school, 21.6% were in high school, 24.5% were university graduates, and 5.3% had a master's/doctorate. 41.1% of the participants had low, 49.3% had medium and 9.6% had high economic income. 18.5% had 1 child, 36.5% had 2 children, and 45% had 3 or more children. The average age of the participating parents was 33.5±7.5 years (**Table 1**).

RESULTS

Exploratory (EFA) and confirmatory (CFA) factor analyses were performed to establish the construct validity of the draft scale.[26,35]

Findings Regarding Factorization

First, the data was checked to determine whether it was suitable for factoring.[36] The relationships between the items should be examined before performing factor analysis on the data obtained through field research. The correlation coefficients in these relationships should not be too high or too low.[21,37]

Table 1. Demographic and social characteristics of the study participants		
Variables	**n**	**%**
Parents		
Mother	280	67.3
Father	136	32.7
Education		
Primary school	112	26.9
Secondary school	90	21.6
High school	90	21.6
University	102	24.5
MA/PhD	22	5.3
Income		
Income is less than the expense (low)	171	41.1
Income equals expense (middle)	205	49.3
Income is more than the expense (high)	40	9.6
Number of children		
1	77	18.5
2	152	36.5
3+	187	45.0
Total	416	100.0
Age (mean and standard division)	X=33.5 and SD=7.5	

SD: Standard deviation

Both situations adversely affect the correct factorization. The results showed that the item-total correlation coefficients for the draft scale ranged between 0.406 and 0.699. The fact that the correlation coefficients are not below 0.30 or above 0.90 indicates that the item-total correlation coefficients are within the desired range for factorization (Table 2).

Table 2. Findings for factorization			
		Values that should be*	**Findings**
Item-total correlation coefficient (min-max)		0.30-0.90	0.406-0.699
Determinant of inter-item correlation matrix		>0.00001	0.00002954
Anti-image correlation matrix diagonals value		>0.50	0.750
Communalities value		>0.50	0.516
Kaiser-Meyer-Olkin sample adequacy value		>0.70	0.892
Bartlett's sphericity test	Chi-square value		4253.969
	Degree of freedom		171
	p	<0.05	<0.001

*These values were obtained from different sources in the literature on scale development, Min: Minimum, Max: Maximum

Additionally, there should be no multicollinearity problem in the correlation matrix between the items.[36,38] For this, it is a requirement for proper factorization that the matrix determinant value is greater than 0.00001 and the diagonal value of each value in the matrix is greater than 0.50.[39] In the data obtained by field research, the diagonal values of the anti-image correlation matrix were found to be 0.75 and it was understood that there was no multicollinearity problem (>.00001) (Table 2).

It is not enough to look at correlation values alone to determine whether data are suitable for factoring. It is expected that each item in the scale contributes highly to the factor it is included in. The fact that the communality values of an item are close to 1 means that the item fully represents the factor it is associated with, and this is a desired situation.[40,41] According to Karasar,[37] items with communality values of .50 and below should be removed from the scale because it affects adversely factorization. The smallest commonality value of the data obtained through field research was .516 (Table 2).

In addition, it is recommended to use the Bartlett Sphericity test to test whether the correlations between the examined variables are suitable for factorization. [37] As a result of this test, the p-value is expected to be less than 0.05 and therefore the null hypothesis is rejected.[42] In this study, Bartlett's test of sphericity yielded statistically significant results (p<0.001) (Table 2).

The reliability of factorization is affected by sample size, but there is no consensus on sample size. [21] However, the Kaiser-Meyer-Olkin (KMO) value provides important information about the adequacy of the sample size. If the result of the analysis is greater than 0.7, it shows that the sample size is suitable for factorization.[36] In this study, the KMO value was .892 (Table 2).

All these data have shown that factor analysis can be performed with the data obtained.

Findings on Exploratory Factor Analysis (EFA)

Principal component analysis is the most preferred method thanks to its simpler structure and psychometric properties.[41] Moreover, this method reveals the latent variable(s) by grouping the items under a certain factor or factors.[35] In this study, the principal components analysis method was used since it was aimed to determine under which components (latent variables) the draft scale items were grouped.

With factor rotation, the loading of an item on a factor is attempted to be maximized while the loading of the same item on other factors is attempted to be minimized.[21] Since the existence of a relationship between items is assumed in social sciences, oblique rotation is recommended as a rotation method.[29] In this study, the direct oblique rotation method was selected because it was assumed that there was a correlation between the items.

The number of factors is determined by attempting to maximize the percentage of variance explained, but this must be consistent with the underlying theoretical construct.[36] The number of factors was determined according to four criteria that are frequently used in the literature. The first of these is the Kaiser (eigenvalue) criterion. The eigenvalue of a factor indicates the amount of information it contains about the construct to be measured, and this value must be greater than 1.[41] The second is the variance percentages criterion. The cumulative explained variance ratio must be at least 0.50.[42] The third is the criterion of contribution to the explained variance. The variance explained by each factor/component should not be less than 5%.[40] The last is the scree plot criterion (Table 3). By looking at the scree plot, researchers can determine the number of factors based on the point at which the slope decreases significantly (Figure 2).[34]

Table 3. Findings for exploratory factor and reliability analysis				
I. factor: Parental knowledge and attitudes about the harms caused by digital device use to children	**Factor loading**	**Eigenvalue**	**Explained variance**	**Cronbach α**
Item-16	.853	6.500	34.209%	0.907
Item-17	.835			
Item-18	.830			
Item-19	.830			
Item-15	.792			
Item-14	.691			
Item-13	.673			
Item-12	.648			
Item-11	.646			
Item-10	.619			
II. factor*: Parental attitudes and behaviors in the use of digital devices				
Item-2	.834	2.983	15.595%	0.839
Item-8	.782			
Item-4	.780			
Item-1	.701			
Item-9	.671			
Item-3	.635			
III. faktor*: Instrumentalization of the children in the use of digital devices				
Item-6	.932	2.181	11.477%	0.909
Item-5	.895			
Item-7	.888			
Total		11.664	61.281%	0.979
Total average of the Draft Scale: 75.95±10.7				
	Estimate	**Standard error**	**Composite reliability**	**p**
I.<-->II.	0.306	0.025	4.501	<0.001
I.<-->III.	0.263	0.023	4.545	<0.001
II.<-->III.	0.308	0.032	4.748	<0.001
*Items are reverse-coded				

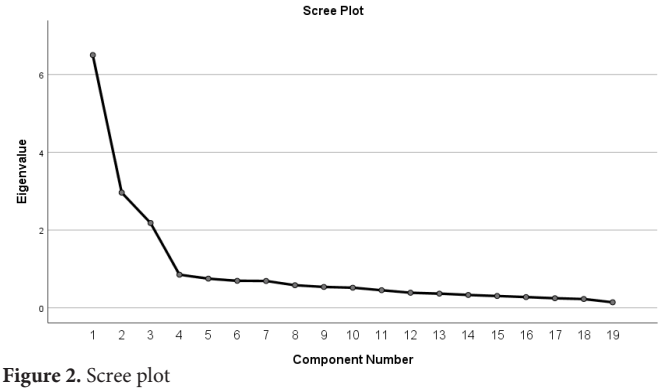

Figure 2. Scree plot

There were three component eigenvalues greater than 1 (the Kaiser criterion). Each component explained more than 5% of the variance (Table 3). When Figure 3 is examined, it is evident the line levels off following the third component (Figure 2). These criteria revealed that the draft scale consists of 3 components. The first factor, called "parental knowledge and attitudes about the harms caused by digital device use to

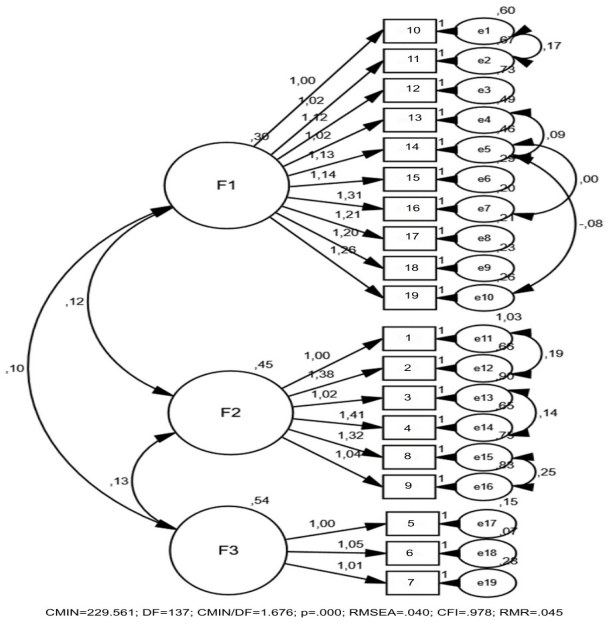

Figure 3. Confirmatory factor analysis results of Draft Scale

children" explained 34.3% of the total variance, the second factor, called "parental attitudes and behaviors in the use of digital devices" explained 15.6% of the total variance, and the third factor, called "instrumentalization of children in the use of digital devices" explained 11.5% of the total variance. The entire draft scale consisting of 19 items explained 61.3% of the total variance, which is above the 50% value accepted in the scale development literature.[29] Item factor loadings ranged from 0.619 to 0.853 for the first component, 0.635 to 0.834 for the second component, and 0.888 to 0.932 for the third component. All components' factor loadings were above 0.45.[38] A statistically significant correlation was found between the first and second components ($r=0.306$, $p<0.001$), between the first and the third components ($r=0.263$, $p<0.001$), and between the second and third components ($r=0.308$, $p<0.001$). The mean total score of the draft scale was 75.95±10.7.

Findings on Confirmatory Factor Analysis (CFA)

CFA was performed to verify the structural validity of the draft scale derived from the EFA results.[26] The analysis was performed using AMOS 24 and the analysis output includes some modification suggestions. Some changes were made for variables with high covariance values and improvements were observed in model fit indices (**Figure 3**). Some modifications were made for variables with high covariance values.[26] The analysis results were evaluated by comparing them according to the confirmatory factor analysis fit criteria table (**Table 4**).[43]

Multiple fit indices were evaluated to assess the model's suitability. The Tucker-Lewis Index (NNFI-TLI), Comparative Fit Index (CFI), Adjusted Goodness of Fit Index (AGFI), Goodness of Fit Index (GFI), Root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) demonstrated a strong model fit. Furthermore, the Normed Fit Index (NFI), Relative Fit Index (RFI), and Parsimony Goodness of Fit Index (PGFI) fell within the range of acceptable fit. Additionally, model values smaller than the thresholds for the Akaike information criterion (AIC), consistent Akaike information criterion (CAIC), and Expected Cross Validation Index (ECVI) further confirmed the model's acceptability.[43]

Findings on Data Reliability

Cronbach's alpha coefficients were calculated to assess the internal consistency of the data (Table 3). The reliability for the first component, 'parental knowledge and attitudes regarding the harms of digital device use on children,' was 0.907. The second component, 'parental attitudes and behaviors in digital device usage,' had a reliability of 0.839, while the third component, 'instrumentalization of children in digital device usage,' showed a reliability of 0.909. The overall reliability of the draft scale was 0.979, with all values exceeding the acceptable threshold of 0.70.[31]

Item discrimination was analyzed to evaluate the internal consistency of the draft scale (**Table 5**). Following the arrangement of total scores in descending order, 112 participants (27%) with the highest and lowest scores were selected for item analysis. An independent samples t-test was conducted to identify differences in scale scores between the lower and upper groups. Each item showed a statistically significant difference ($p<0.001$), confirming that the items effectively differentiated the measured construct.[44]

DISCUSSION

Today, children's digital device uses and addiction is one of the important health problems. At this point, it is frequently stated in the literature that parental attitudes play a decisive role in children's digital device use.[45,46] This study aimed to develop a scale to measure parents' knowledge and attitudes regarding their children's digital device use and to test its validity and reliability by conducting a field study. For this purpose, the scale development process and steps were followed.[19,20]

For content and scope validity, an item pool was created by reviewing the literature, the item pool was presented to field

Table 4. Findings of CFA and comparing to fit indices

Fit indices	Acceptable fit	Good fit	Findings of CFA	Results
$\chi 2/df$	$2\leq\chi 2/df\leq 3$	$0\leq\chi 2/df\leq 2$	1.676	Gf
SRMR	$0.05\leq SRMR\leq 0.08$	$0.00\leq SRMR\leq 0.05$	0.045	Gf
RMSEA	$0.05\leq RMSEA\leq 0.10$	$0.00\leq RMSEA\leq 0.05$	0.040	Gf
NFI	$0.90\leq NFI\leq 0.95$	$0.95\leq NFI\leq 1.00$	0.947	Af
CFI	$0.90\leq CFI\leq 0.95$	$0.95\leq CFI\leq 1.00$	0.978	Gf
GFI	$0.90\leq GFI\leq 0.95$	$0.95\leq GFI\leq 1.00$	0.946	Af
AGFI	$0.85\leq AGFI\leq 0.90$	$0.90\leq AGFI\leq 1.00$	0.925	Gf
NNFI (TLI)	$0.90\leq$ NNFI (TLI)≤ 0.95	$0.95\leq$ NFI (TLI)≤ 1.00	0.972	Gf
RFI	$0.90\leq RFI\leq 0.95$	$0.95\leq RFI\leq 1.00$	0.934	Af
PNFI	$0.50\leq PNFI\leq 0.95$	$0.95\leq PNFI\leq 1.00$	0.759	Af
PGFI	$0.50\leq PGFI\leq 0.95$	$0.95\leq PGFI\leq 1.00$	0.682	Af
AIC	The model compared is smaller than the AIC value		335.561<380.000	Af
CAIC	The model compared is smaller than the CAIC value		602.188<1778.76	Af
ECVI	The model compared is smaller than the ECVI value		0.809<0.916	Af

CFA: Confirmatory, SRMR: Standardized root mean square residual, RMSEA: Root mean square error of approximation, NFI: Normed Fit Index, CFI: Comparative Fit Index, GFI: Goodness of Fit Index, AGFI: Adjusted Goodness of Fit Index, TLI: Tucker-Lewis Index, RFI: Relative Fit Index, PGFI: Parsimony Goodness of Fit Index, AIC: Akaike information criterion, CAIC: Consistent Akaike information criterion, ECVI: Expected Cross Validation Index

Table 5. Findings on item discrimination

		X	SD	t	p			X	SD	t	p
I-1	Lower	2.8	1.2	-10.87	0.000	I-11	Lower	2.9	1.2	-7.578	0.000
	Upper	4.4	0.9				Upper	4.1	1.0		
I-2	Lower	2.3	0.9	-12.98	0.000	I-12	Lower	3.2	1.1	-7.645	0.000
	Upper	4.1	1.1				Upper	4.2	0.9		
I-3	Lower	2.8	1.1	-10.88	0.000	I-13	Lower	3.3	1.1	-7.504	0.000
	Upper	4.3	1.0				Upper	4.2	0.8		
I-4	Lower	2.4	1.0	-14.44	0.000	I-14	Lower	2.9	1.1	-9.172	0.000
	Upper	4.3	0.9				Upper	4.2	0.9		
I-5	Lower	3.9	1.1	-9.54	0.000	I-15	Lower	3.4	1.0	-7.848	0.000
	Upper	4.9	0.2				Upper	4.4	0.7		
I-6	Lower	4.0	1.1	-8.35	0.000	I-16	Lower	3.2	1.0	-8.809	0.000
	Upper	4.9	0.2				Upper	4.3	0.8		
I-7	Lower	3.9	1.2	-7.79	0.000	I-17	Lower	3.4	0.9	-10.260	0.000
	Upper	4.9	0.5				Upper	4.5	0.6		
I-8	Lower	2.6	1.1	-13.15	0.000	I-18	Lower	3.5	1.0	-9.459	0.000
	Upper	4.4	1.0				Upper	4.5	0.6		
I-9	Lower	3.0	1.2	-12.151	0.000	I-19	Lower	3.5	0.9	-10.168	0.000
	Upper	4.6	0.7				Upper	4.5	0.6		
I-10	Lower	3.3	1.0	-10.935	0.000						
	Upper	4.6	0.7								

t: Independent samples T test, lower (n)=112, upper (n)=112, SD: Standard deviation

experts for their opinions, and a pilot study was conducted.[26,47] After the revisions, a field study was conducted on a large sample for the 19-item, 5-point Likert-Type Scale.[34]

Exploratory and confirmatory factor analysis was conducted to determine the construct validity of the scale.[26,35] The determination of the number of factors was guided by eigenvalues, percentage of variance explained, contribution to total variance, and an evaluation of the scree plot.[34] EFA revealed a three-factor structure explaining 61.3% of the total variance, exceeding the 50% minimum threshold recommended in scale development.[36] CFA was performed to test the construct validity of the factor analysis results. CFA confirmed the EFA structure, demonstrating good and acceptable model fit across all indices.[43] The Cronbach alpha coefficient of 0.979 indicated excellent internal consistency,[31] and item discrimination analyses validated the scale's ability to measure the intended constructs.[44] As a result of the procedures performed for content, scope, and structural validity, it was determined that the scale consisted of 19 items and 3 factors.

This study developed the 'parental knowledge and Attitude Scale for children's use of digital devices,' focusing on children aged 6 months to 6 years, which distinguishes it from existing scales in the literature that predominantly target older age groups.[16,17] The lack of comprehensive measurement tools addressing early childhood digital device use highlights a significant gap in the field. By addressing this gap, the study contributes to the literature by revealing the multidimensional nature of parental attitudes toward digital device use.

CONCLUSION

The final scale comprised 19 items across three sub-dimensions, presented in a 5-point Likert format (Appendix-1). The "Parental Knowledge-Attitude Scale for children's use of digital devices" is a valid and reliable instrument that enables researchers and practitioners to assess parental knowledge-awareness and attitudes toward children's digital device use.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Atatürk University Faculty of Nursing Ethics Committee (Date: 15.02.2023, Decision No: 2023-1/13).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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