Original Article

Reliability and Validity of a Turkish version of the Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea

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Abstract

Background: Early Childhood Diarrhea has been observed to be an important health problem in Turkey. However, no scale is currently available to evaluate Maternal Self-Efficacy for Preventing Early Childhood Diarrhea in Turkey.
Aim: This study aims to test the reliability and validity of the Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea.
Method: The methodological research model was used in the study. The study was conducted in five Family Health Centers between June 17, 2016 and March 19, 2018. The study population consisted of mothers of at least one 0-5-year-old child, who admitted to one of the five Family Health Centers located in the province of Erzincan, Turkey. The sample of the study consisted of mothers selected from the specified population, who meet the research criteria and agreed to participate in the research. 274 mothers were included in the research. For the test-retest reliability, 105 mothers from the same sample group were tested again after four weeks. In the collection of research data, the "Introductory Information Form", "Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea" were used.
Results: The Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea was adapted to Turkish and found to be a valid and reliable measurement instrument. The scale's Cronbach's alpha reliability coefficient was found to be 0.74. The scale consists of 22 items and 3 sub-scales.
Conclusion: The Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea found to have an adequate validity and reliability for Turkish society.

Keywords: Nursing, Diarrhea, Self-efficacy

Introduction

Diarrhea is among the most prominent causes of mortality and morbidity for infants and children in developing countries (Cavusoglu 2011; Das, Salam, & Bhutta, 2014; Peter & Umar, 2018). According to the World Health Organization (WHO); more than 12 million children die each year because of Diarrhea, infection, and malnutrition in developing countries (Koksal & Gokmen, 2015).

Approximately 1.3 billion cases of diarrhea occur around the world each year in children under 5 years of age (Cavusoglu 2011; Kılıc, Polat & Cimen, 2013). More than two million children die of diarrhea (Cavusoglu 2011). 90% of all diarrhea-related deaths are seen in children under 5 years of age, living in countries of low and moderate income (Ahs et al. 2010). In our country diarrhoea takes second place among the causes of child mortality (Kılıc, Polat & Cimen, 2013).

30.000 children die each year because of diarrhoea in our country (Cavusoglu 2011; Kilic, Polat & Cimen, 2013). According to 2016 data by Turkish Statistical Institute (TUİK); diarrhea was detected in 32.3% of children of 0-6 age group (Turkish Statistical Institute [TUİK] 2016). According to 2008 results of Turkish Population and Health Research; diarrhoea was detected in 23% of children (Turkey Demographic and Health Survey [TDHS] 2008).In the literature it has been stated that adequate level of self-efficacy in mothers plays a role in the management of the diarrhoea process (Mollaoglu 2012; Ozpulat 2016; Joventino et al. 2013).Self-efficacy is a belief about one's capability (Bandura 1997). Self-efficacy enables the individual to determine how to feel, think, and act, and it also helps individuals to evaluate themselves, their abilities and capacities more objectively. A high level of self-efficacy in individuals leads to a higher faith in success and better management of occurrences (Mollaoglu 2012). Individuals with high self-efficacy perform more applications for a healthy lifestyle, and consequently achieve a higher level of health and quality of life (Ozpulat 2016). Self-efficacy has been proven as a strong indicator related to infant health and to protective pattern of behavior in mothers (Joventino et al. 2013). Therefore improvement of the self-efficacy of the mothers will impact on the prevention of diarrhea (Githae 2018). The results of Zheng et al.'s study (2018), women were less sure of their capability in taking care of their baby when he/she suffered from some common diseases, such as diarrhoea, constipation and fever, and these lower maternal self-efficacy levels for management of some diseases need to be improved.

Among studies conducted in our country or abroad, this type of study has not been encountered. This study is expected to contribute to the definition and enhancement of self-efficacy of mothers regarding diarrhoea, and for prevention of this disease in children.

Aims of the study: This study aims to test the reliability and validity of the Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhea.

Methods: "Maternal Self-Efficacy for Preventing Early Childhood Diarrhoea" was adapted into Turkish and its validity and reliability was tested. With this aspect, the study was conducted as the methodological research model.

Research Place and Time: The research was conducted between 17th June 2016 - 19th March 2018 in 5 Family Health Centers (FHC) in the province center of Erzincan. There are a total of 7 FHC's in the province center of Erzincan. 5 FHC's were included in the research consisting of "Karaagaç, İnonu, Mimarsinan, İzzetpasa, and Fatih" which had higher population of patients, contained different levels of socio-economic profiles, and represented the community better in terms of socio-economic status.

Study Population and Sample Selection: The universe of the research consisted of mothers with at least one child between ages 0-5 who applied to the said FHC's for any reason. No sampling choices were made in the research and mothers who fit the criteria of the research were included in the study. In the adaptation of a scale to another culture, an approach of reaching the size of a group of at least 5-10 times the number of items of the scale (Erdogan, Nahcivan & Esin, 2015) was taken as a basis, and 274 mothers who accepted to participate, which is approximately 11.5 times the number of scale items, became the sampling of the research.

The criteria of inclusion for the mothers were;

-        Having at least one child between 0-5 years of age,

-        Having no mental issues or any problem preventing her understanding of the scale,

-        Having inclination for communication and consent to participate in the research,

-        Being above 18 years of age.

Instrument

The Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea

This scale was developed to prevent early childhood diarrhea by Joventino et al. in 2013 (Joventino et al. 2013). It consists of a total of 24 items. The scale has 2 subscales: 15 items of family hygiene and 9 items of nutrition/general applications. It is a likert type scale classified with score points in an order from 1 to 5. The numbers are represented as follows: "1=Strongly Disagree, 2=Disagree, 3=Moderately Agree, 4= Agree, 5=Strongly Agree". The mother takes points between 1 and 5 from each item according

to the answers given by her. Thus the total score points sum up between 24 and 120. Higher score points represent higher levels of self-efficacy of the participants. Mothers with high scores are considered as individuals with higher confidence in their own abilities to prevent diarrhea in their children.

The scale had certain cut-off points. 109 points or less indicate a low level of self-efficacy to prevent childhood diarrhea, 110 to 114 points indicate a moderate level of self-efficacy, and 115 points or more is defined as a high level of self-efficacy to prevent childhood diarrhea. The original scale has a Cronbach alpha level of 0.84. The analysis of test retest stability demonstrated moderate correlations between the first and second application of the scale (r=0.45, p=0.026). Factor loading of the items vary between 0.3 and 0.7 . Joventino et al. (2013) have stated that The Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea is a valid and reliable scale (Joventino et al. 2013).

Translation, Content Validity and Pilot Study

The translation of The Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea was made from English to Turkish by two academicians from the Branch of Main Sciences for English Teaching. The translated expressions in Turkish were inspected and edited with comparisons to the original form by the consultant and the researcher. The edited expressions in Turkish were inspected by an academician from the Department of Turkish Language and Literature. After that, the Turkish form was re-translated back into English by an academician from the Branch of Main Sciences for English Language and Literature. Once more the English translation was compared with the Turkish expressions by the consultant and the researcher, and the necessary editing was performed. Finally, the Turkish version of the scale was inspected and edited accordingly by an academician from the Department of Turkish Language and Literature.

After linguistic validity, the scale was presented to the opinion of 11 academicians who were experts in their fields. The experts whose opinions were obtained via e-mail inspected the comprehensibility and cultural compatibility of the scale items. The technique of Davis was used for evaluating the expert opinions (Erdogan, Nahcivan & Esin, 2015). The Coverage Validity

Index (CVI) was found as 0.98 at the end of the analysis applied for evaluating the opinions of the experts. The CVI points of the items of the scale varied between 0.91 and 1.00 points. CVI being 0.80 and more indicated sufficiency for the item in terms of coverage validity (Erdogan, Nahcivan & Esin, 2015).

After these procedures the items had to be applied to a small group for pilot practice in terms of meaning (Aksayan & Gozum, 2002). After analysis of coverage validity, the scale was applied as a pilot practice to 20 mothers that were not included in the research. After that, requisite adjustments were performed in line with the opinions collected from the mothers, and the scale was given its final state.

Data Collection

Family health centers were visited 5 days a week ("Fatih FHC" on Monday, "Karaagaç FHC" on Tuesday, "İnonu FHC" on Wednesday, "Mimarsinan FHC" on Thursday, "İzzetpasa FHC" on Friday) and mothers who fit the research criteria and accepted to participate in the research were included in the study.

274 mothers who had children between 0-5 years of age and applied to the 5 FHC's in the province center of Erzincan for any reason were given the preliminary application via face-to-face method, and appointments for a month later were given to the mothers for the evaluation of test-retest reliability. Home visits were conducted to the addresses taken from the mothers and 105 mothers were given the second application via face-to-face method. Interviews with each individual had a mean duration of 10-15 minutes. Data were collected between June 2016 - March 2018.

Data Analysis: SPSS for Windows 22.00 and Lisrel 8.8 software programs were used to analyse the data. In order to conduct the statistical analysis, number, percentages, mean, standard deviation, validity and reliability analyses were used.

Ethical Considerations: Before the start of the research, written permission was obtained from the responsible author Monica Oria via e-mail to evaluate the Turkish validity and reliability of the "Maternal Self-Efficacy Scale for Prevention of Early Childhood diarrhea" developed by Joventino et al. Ethical approval was obtained from the Ethics Committee of Ataturk

University, Faculty of Health Sciences (dated 17.06.2016) and official permission was obtained from the relevant institution. Care was taken to ensure voluntary participation of the mothers included in the study. Parents of the children who met the inclusion criteria were informed of the aim of the study and then their questions were answered and their written consent was received. The participants were provided with explanations that their personal information would not be disclosed to other parties, and "Privacy Policy" was fully observed. The mothers were informed that the information they provide would be kept confidential and used nowhere else, and that they would be free to cease participation anytime if they would wish so.

Results

Characteristics of Participants: Of the mothers, 50.4% were 31 years old or above, and of the fathers, 55.1% were in the age group between 31-40. 53.6% of the children were male and 38% of the families had two children. 84.3% of the mothers were housewives, 46.4% of the fathers were found to have self-employment. 30.3% of the mothers and 35.8% of the fathers had high school education. 84.3% of the mothers were not employed while all of the fathers were employed. 58.8% of the families had their incomes equal to their expenditures.

Validity Analysis: Kaiser-Mayer-Olkin (KMO) test was used to detect the compatibility of the factor analysis of the data, and Bartlett test was applied to detect any presence of relationships between variables (Buyukozturk 2017). KMO coefficient was found as 0.748. This result was recommended to be equal to or above the rate of 0.60 (Buyukozturk 2017; Seçer 2015). This result indicated that the size of the sampling was appropriate in terms of factor analysis. It was stated that the chi-square value of the Bartlett test was at the level of significance of $p<0.05$. This result indicated that the data presented with applicability of factor analysis.

Exploratory Factor Analysis: Exploratory factor analysis is the method of identifying the number of subtitles of the items in a measuring tool and the structure of the relationship between those items (Seçer 2015). Varimax rotation with

the basic components method was applied to the Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea. After the factor analysis of the Maternal Self-Efficacy Scale for Preventing Early Childhood Diarrhoea, a 6-factor structure was found that explained 61.934 of the total variance with eigenvalue above 1.00. Scree Plot test was applied. Factor analysis was limited to 3 factors after the result of Scree Plot test and was re-applied with varimax rotation method.

It was observed that the 1st factor explains 14.69% of the total variance, the 2nd factor explains 14.62% of it, and the 3rd factor explains 14.46% of it, while all of these factors together explain 43.78% of the total variance. A 3-factor structure was found with eigenvalue above 2 that explains 43.78 of the total variance after the factor analysis of the Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea. In the factor analysis it was considered as appropriate to find the percentage of explanation of the total variance by factor loading at and above 0.40 (Worthington & Whittaker, 2006) (Table 1).

According to the evaluation of exploratory factor analysis, the factor loading of the scale varied between 0.33 and 0.89 (Table 1). In the factor analysis it was considered as appropriate to find the factor loading at and above 0.30 (Buyukozturk 2017; Seçer 2015). These findings indicated the compatibility of the structural validity of the scale.

The components of the 3-factor structure of the scale were inspected and the following names were suggested for the factors:

1.   The factor comprised by a total of 8 items, which were the 4th, 5th, 6th, 9th, 13th, 15th, 17th, 21st items, was given the name of *"Personal Hygiene"* .

2.   The factor comprised by a total of 9 items, which were the 1st, 2nd, 3rd, 7th, 8th, 10th, 11th, 12th, 22nd items, was given the name of *"Child-Oriented Hygienic Behaviours"* .

3.   The factor comprised by a total of 5 items, which were the 14th, 16th, 18th, 19th, 20th items, was given the name of *"General Hygienic Behaviours"* . (Table 1).

Table 1. Distribution "Maternal Self-efficacy Scale for Preventing Early Childhood Diarrhea" Items by Factors and Factor Loads

Items	Factors		
	1	**2**	**3**
PERSONAL HYGIENE			
4. I am able to wash my hands with soap and water before preparing or handling food.	0.580		
5. I am able to keep clean the place where I prepare the food.	0.706		
6. I am able to cover food and water after I serve myself.	0.523		
9. I am able to wash my hands with soap and water before feeding my child.	0.416		
13. I am able to wash my hands with soap and water after handling the trash	0.461		
15. I am able to throw my house trash, tied in bags, away.	0.636		
17. I am able to wash my hands with soap and water after using the toilet.	0.750		
21. I am able to wash my hands with soap and water after cleaning my child when he goes pee or poop.	0.622		
CHILD-ORIENTED HYGIENIC BEHAVIOURS			
1. I am able to make my child wash his hands with soap and water before meals.		0.567	
2. I am able to wash vegetables and fruits with water and sodium hypochlorite or bleach.		0.608	
3. I am able to observe the expiration period of the products before offering them to my child.		0.335	
7. I am able to breastfeed my child for more than 6 months.		0.437	
8. I am able to give more than one bath per day to my child.		0.575	
10. I am able to prevent my child from putting dirty objects in his mouth.		0.492	
11. I am able to avoid left over from previous meals for my child.		0.703	
12. I am able to offer exclusive breastfeeding for my child in his first 6 months of life.		0.638	
22. I am able to boil or filter drinking water or buy mineral water to offer to my child.		0.540	
GENERAL HYGIENIC BEHAVIOURS			
14. I am able to cut my child's nails when necessary.			0.779
16. I am able to keep my home clean throwing trash out of the house.			0.891
18. I am able to offer healthy food for my child after I stop breastfeeding (e.g., fruits, vegetables, meat, eggs, chicken, rice, beans).			0.672
19. I am able to keep my house clean before my child walk/play on the floor.			0.537
20. I am able to make my child keep his shoes on out of the house.			0.846
Explained variance %	14.695	14.623	14.462
Explained total variance %	14.695	29.318	43.780

Table 2. CFA Results Fit İndex

Fit Index	Results
$\chi2/Sd$	0.46
GFI	0.91
AGFI	0.93
RMSEA	0.07
RMR	0.05

Table 3. Intercorrelations of Subscale and Maternal Self-efficacy Scale for Preventing Early Childhood Diarrhea

Intercorrelations of Subscale and The Scale	1	2	3	Total
1. Personal Hygiene	1			
2. Child-Oriented Hygienic Behaviours	.282**	1		
3. General Hygienic Behaviours	.311**	.241**	1	
The total score of scale	.533**	.941**	.479**	1
Arithmetic mean	39.39	35.20	24.60	99.19
Standard deviation	1.466	5.118	1.284	6.209
Cronbach Alpha coefficients	.660	.706	.801	.742
Ranj	9	27	17	34

(**) $p<0.001$

Table 4 The Relationship between the First and Second Application Scores of the Maternal Self-efficacy Scale for Preventing Early Childhood Diarrhea

Applications	The correlation value of the relationship between test-retest scores	
	r	*p*
First application	0.861	0.000
Second application		

Confirmatory Factor Analysis (CFA)
In this part of the study, the 3-factor structure that emerged as a result of the exploratory factor analysis was tested for validation. Confirmatory factor analysis is the testing of the structure or model identified by the exploratory factor analysis, or the evaluation of whether it is validated or not (Seçer 2015).In this study, due to the data differing from normal distribution and also taking the sample size into consideration, LISREL program and the maximum likelihood method was used to estimate parameters in the model of measurement and in the structural model. LISREL command script was created and the measurement model was processed. First of all, possible occurrence of unwanted predictions were examined among the predicted variables. As a result, no unwanted predictions were observed such as negative or meaningless error variances, standard coefficients too close to or above 1, or abnormally high standard errors.

Confirmatory factor analysis (CFA) was applied to ascertain whether the factor structure of the original form of the scale was accurate. Level One CFA-related findings were shown on Figure 1. Many compliance indices were used to detect the adequacy of the model which was measured for compatibility with the confirmatory factor analysis (Seçer 2015). In the CFA performed, the compatibility indices of the 3-factor model of the scale were evaluated.The compatibility statistics related with the model were significant and as close as possible to the reference values. According to the CFA findings $\chi2$=974.72; N=436; sd=209, and p=0.000 values were identified. $\chi2$ results measuring model-data compliance stated that the data were compatible with the model. $\chi2/sd$= 0.46 which was less than ≤5 as the acceptable reference value. This finding also indicated the compatibility of data with the model.

Root Mean Square Error of Approximation (RMSEA) was within acceptable reference values with 0.076, which was another indicator of model-data compatibility. Additionally, other compliance indices also indicated to the compatibility of the suggested model: [Goodness of Fit Index (GFI)=0.91, Adjusted Goodness of Fit Index (AGFI)=0.93, Root Mean Residual (RMR)=0.05 (90% confidence interval 0.032 – 0.083)]. (Table 2 and Figure 1). All of these findings indicated that the level of model-data

compatibility was acceptable. In other words, it could be stated that the 3-factor model was appropriate and the structural validation of the scale was provided.

Reliability Analysis
Internal consistency
To evaluate the internal consistency of the Maternal Self-Efficacy Scalefor Preventing Early Childhood diarrhea, Cronbach Alpha coefficient and item-total score correlation coefficients were calculated. As the item-total score correlation of the 12th and 14th items of the Maternal Self-Efficacy Scale for Preventing Early Childhood diarrhea was low, they were excluded from the scale. The scale consisted of 22 items and a 3-factor structure.

When Cronbach Alpha values of the scale were checked, Cronbach α value of the first subscale was found as 0.66, Cronbach α value of the second subscale was found as 0.70, and Cronbach α value of the third subscale was found as 0.80. In the meantime, Cronbach α value of the scale was observed as 0.74 (Table 3). All of the correlation values of the scale with the subscales were found to be significant at the level of p<0.001. (Table 3).

Item total score correlation values varied between 0.20 and 0.66 and were found to be statistically significant.

Time Invariant (Test-Retest Method)
Pearson's product moment correlation analysis was used to evaluate whether the scale was subject to change over time (Tablo 4).
As seen on Table 3, the correlation value of the relationship between test-retest scores came as r=0.86 and it was found to be significant at the level of p<0.001. This result indicated that the results of test-retest measurements of the scale applied with 30 day intervals were similar.

Cut-off Point
The scale had certain cut-off points. In the original scale, the cut-off point was calculated according to the 25th and 50th percentile (Joventino et al. 2013). In the Turkish version of the scale, the cut-off point was recalculated according to the 25th and 50th percentile of the total score. Mothers collected points between 1 and 5 from each item according to their answers to the questions of the scale. Thus the total score of the scale varied between 22 and 110. As percentages for prevention of childhood diarrhea, total scores equal to or less than 96 (<25th

Percentile) were found to indicate low self-efficacy; those between 97 and 101 (25th Percentile - 50th Percentile) indicated a moderate level of self-efficacy, and those equal to or more than 102 (>50th Percentile) indicated high self-efficacy.
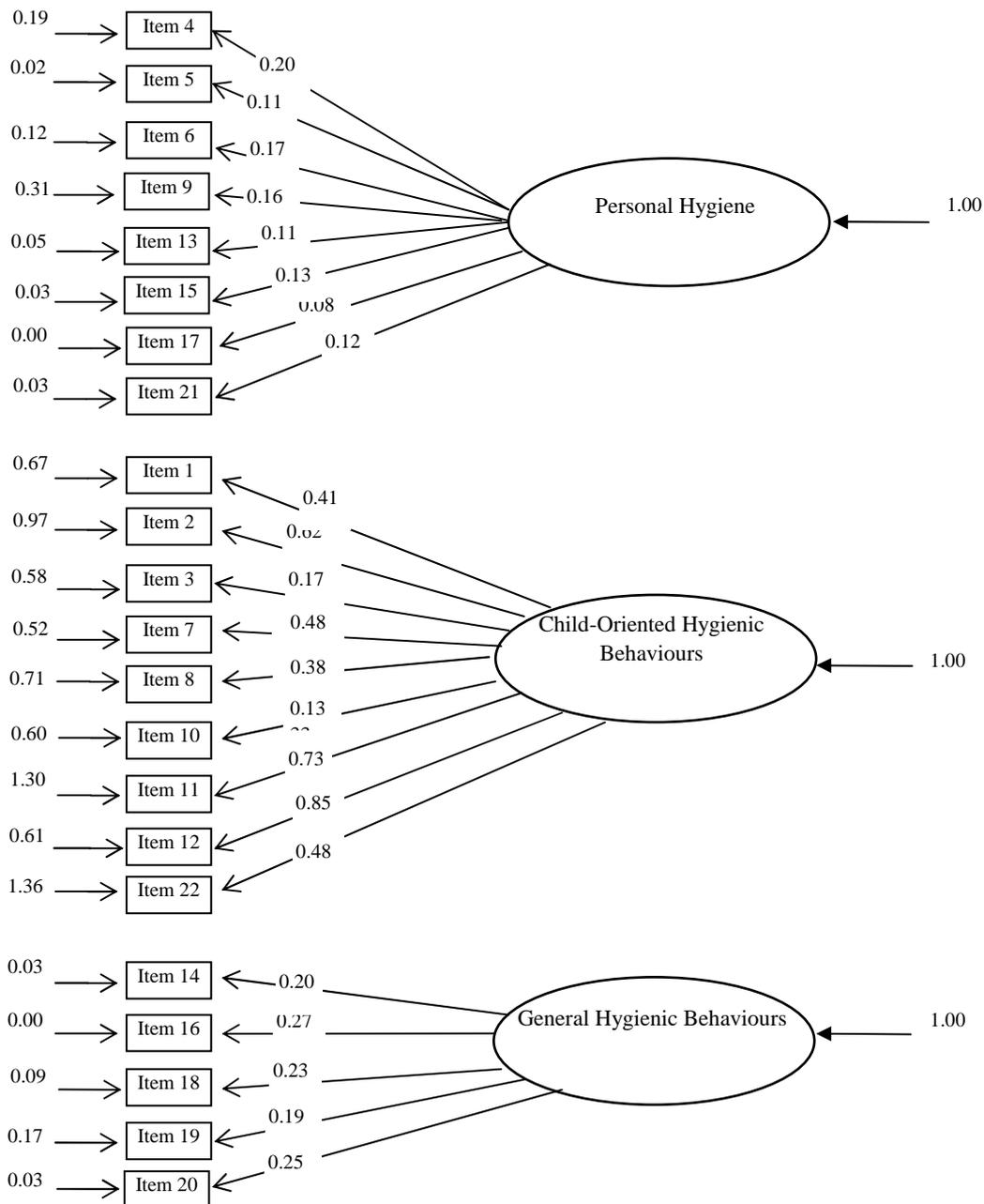
Chi-Square=974.72, *df*=209, *P*-value=0.00000, RMSEA=0.076

Figure 1. **Factor Loads of the Maternal Self-efficacy Scale for Preventing Early Childhood Diarrhea by Confirmatory Factor Analysis**

Discussion

To evaluate the validity of the scale, priority was given to the inspection of language validity. After doing back-and-forth translation, expert opinions were also obtained and the necessary adjustments were performed accordingly. Although it takes time, recursive translation is the best preferred method around the world to provide cultural compatibility of the scale (Aksayan & Gozum, 2002). For this purpose there must be at least two translators without connections to one another. The first translator translates the original language into the targeted language, and the second translator translates the scale in the targeted language back to its original language (Erdogan, Nahcivan & Esin, 2015; Aksayan & Gozum, 2002). The translated expessions are inspected in terms of conveying the same meaning as the expressions in the original scale (Erdogan, Nahcivan & Esin, 2015).

Coverage validity is used to evaluate the sufficiency of the scale or each item in the scale in terms of desired attributes (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017; Seçer 2015). "Expert opinion" must be obtained for testing coverage validity (Buyukozturk 2017). In expert opinion, experts evaluate the scale for language compatibility and clarity (Aksayan & Gozum, 2002). The technique of Davis was used for evaluating the expert opinions. In the study, after translation, the items of the scale were evaluated by 11 academicians who were experts in their fields, and CVI value was found as 0.98. The CVI points of the scale items varied between 0.91 and 1.00. CVI equal to or more than 0.80 indicates that the item is sufficient in terms of coverage validity (Erdogan, Nahcivan & Esin, 2015).

In the structural validity, the level of correct measurement of an abstract concept by a tool of measurement is evaluated (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017). The best method to evaluate structural validity in the statistical sense is "factor analysis" (Seçer 2015). Factor analysis is a statistical method that collects interrelated variables and aims to express them with less number of variables (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017; Seçer 2015). Factor analyses are evaluated by two different methods such as exploratory and confirmatory factor analysis (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017).

"KMO" and "Barlett test" are used to detect the suitability of the data to the factor analysis (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017). KMO coefficient indicates the adequacy of the size of sampling (Seçer 2015). KMO coefficient is expected to be at or above 0.60 (Buyukozturk 2017; Seçer 2015). In the study the KMO coefficient of the scale was observed as 0.748. This finding indicates that the size of sampling is adequate for factor analysis. Bartlett test is applied to evaluate whether the variables demonstrate correlations with one another (Erdogan, Nahcivan & Esin, 2015). Barlett's test result x^2=2222.769 was found and the chi-square value related with Bartlett test was observed to be significant at the level of $p<0.05$. This finding indicated that the scale was appropriate for factor analysis.

In the factor analysis it was considered as appropriate to find the factor loading at and above 0.30 (Buyukozturk 2017; Seçer 2015). From this angle, factor loading of all items were above 0.30 (Tablo 1). It was observed that the 1st factor explains 14.69% of the total variance, the 2nd factor explains 14.62% of it, the 3rd factor explains 14.46% of it, and that all of these factors explain 43.78% of the total variance. A 3-factor structure was found with eigenvalue above 2 and total variance of %43.78 (Table 1). In the factor analysis it was considered as appropriate to find the percentage of explanation of the total variance by factor loading at and above 0.40 (Worthington & Whittaker, 2006). Eigenvalue is an important coefficient in calculating the variance explained by a single factor alone, and the eigenvalue of a subscale must be at least 1. Each of the sub factors must explain at least 5% of the total variance existing within the scale (Seçer 2015).

Confirmatory factor analysis is used to test a hypothesis detected about an association between the variables (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017). In nursing research studies, CFA is used to analyse the factor structure of a scale. The compatibility of the factor structure of a scale is an element of requirement in researches of validity and reliability (Çapık 2014). An RMSEA value equal to or lower than 0.08, and the p value lower than 0.05 are indicators of good compatibility. Also the indices of Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Relative Fit Index (RFI), Incremental Fit Index (IFI), and Normed Fit Index (NFI) are accepted

as above 0.90 (Erdogan, Nahcivan & Esin, 2015; Seçer 2015; Çapık 2014).

The compatibility statistics related with the model were significant and as close as possible to the reference values. According to CFA results, the following values were found: $\chi2=$ 974.72; *N*=436; *sd*=209 and *p*=0.000, $\chi2/sd$=0.46, RMSEA 0.076, GFI=0.91, AGFI=0.93, RMR=0.05 (90% confidence interval 0.032 – 0.083). (Table 2 and Figure 1). All of these findings indicated that the level of model-data compatibility was acceptable. In other words, it could be stated that the 3-factor model was appropriate and the structural validation of the scale was provided.

Item statistics method and Cronbach alpha coefficient were used to evaluate internal consistency and homogeneity in the reliability study of the Maternal Self-Efficacy Scale for Prevention of Early Childhood diarrhea (Gozum & Aksayan, 2003). As the item-total score correlation of the 12th and 14th items of the Maternal Self-Efficacy Scale for Prevention of Early Childhood diarrhea was low, these two items were excluded from the scale.

In the scale, Cronbach α value of the personal hygiene subscale was found as 0.66, Cronbach α value of the child-oriented hygienic behaviours subscale was found as 0.70, Cronbach α value of the general hygienic behaviours subscale was found as 0.80, and the Cronbach α value of the scale was found as 0.74 (Table 3). In the literature it was stated that Cronbach alpha coefficient found between 0.60-0.80 was sufficient for usage in researches (Akgul 2003). In this study Cronbach alpha coefficients were in sufficient levels. In the original scale that Joventino et al. developed in 2013, the Cronbach alpha level was 0.84 (Joventino et al. 2013). This might be due to cultural differences between the communities.

The item total score correlation values of the scale varied between 0.20 and 0.66, and all of the item-total score correlations of its items were found to be significant at the level of *p*<0.01 . Item-total score correlations provide information about the relationship between the scores of test items and the total test scores (Buyukozturk 2017). The lowest value of item-total score correlation is 0.20 (Buyukozturk 2017; Gozum &Aksayan, 2003).

In the test-retest method, the tool of measurement is applied twice to a group of sampling with a certain time interval (maximum 1 month) (Erdogan, Nahcivan & Esin, 2015; Buyukozturk 2017; Seçer 2015). In the re-testing appication the time interval must not be shorter than two weeks or longer than four weeks (Gozum & Aksayan, 2003). Between the scores of the two applications, "pearson product moment correlation test" and "correlation coefficient" (*r* value) are calculated. The "*r*" value thus obtained determines the degree of reliability, and this value must draw close to 1 and be above at least 0.70 (Erdogan, Nahcivan & Esin, 2015; Gozum & Aksayan, 2003). To establish the reliability of the scale, 105 mothers were given the test-retest application after four weeks. In the test-retest reliability, *r*=0.86 and the two measurement results were found to be significant at the level of *p*<0.001 (Table 4). This result reflected that the results of the measurements of the test-retest application implemented with an interval of 30 days were similar and consistent.

Conclusions: The scale consists of 22 items and 3 subscales. It can be used in the measurement of the self-efficacy of mothers at preventing diarrhea in their children.

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