

The Validity and Reliability Study of the Turkish Adaptation of the Feeding Practices and Structure Questionnaire

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ABSTRACT

Objective: To evaluate the validity and reliability of the Turkish adaptation of the Feeding Practices and Structure Questionnaire.

Material and methods: This study was conducted with 314 parents of preschool children aged 2-5 years. The Feeding Practices and Structure Questionnaire, the Parental Feeding Style Questionnaire, and a demographic questionnaire were applied to the parents. The anthropometric characteristics of the parents were evaluated using body mass index, and the z-score values of the children were evaluated with the WHO Anthro Plus program. While examining the validity and reliability of the adapted questionnaire, content validity, internal validity, external validity, Cronbach's alpha reliability coefficient, and test-retest reliability were analyzed. Item-person separation and item-person mean square fit statistics were assessed with the Rasch analysis. The protocol of the study was approved by the Ethics Committee of Marmara University Health Sciences Institute with the number of 2019-36 dated February 18, 2019.

Results: The content validity index of the questionnaire was over 0.80 for all items, and Cronbach's alpha coefficient was 0.74. A significant difference was found for all items in the test-retest analysis ($p < 0.01$). According to the Rasch analysis, the person separation index was 1.57 and the item separation index was 11.93; the data showed very high item reliability (0.99), while individual reliability (0.71) was very low.

Conclusion: This study showed that the Feeding Practices and Structure Questionnaire was reliable but not valid due to the characteristics of the sample.

Keywords: Feeding practices, preschool, parent, validity, reliability

Besleme Uygulamaları ve Yapısı Anketi Türkçe Geçerlik ve Güvenilirlik Çalışması

ÖZET

Amaç: Bu çalışma Besleme Uygulamaları ve Yapısı Anketi'nin Türkçe geçerlilik ve güvenilirliğini değerlendirmek amacıyla yapılmıştır.

Gereç ve Yöntem: Bu çalışma 2-5 yaş aralığında okul öncesi dönem çocuğu olan 314 ebeveyn ile yürütülmüştür. Ebeveynlere Besleme Uygulamaları ve Yapısı Anketi, Ebeveyn Besleme Tarzı Anketi ve demografik anket formu uygulanmıştır. Ebeveynlere ait antropometrik özellikler beden kütle indeksi, çocuklar için ise z skoru değerleri WHO Anthro Plus programı ile değerlendirilmiştir. Anketin geçerlik güvenilirliği değerlendirilirken kapsam geçerliği, iç geçerlik, dış geçerlik, Cronbach alfa güvenilirlik katsayısı ve test-tekrar test güvenilirliği incelenmiştir. Rasch analizi ile madde-kışı ayırımı ve madde-kışı ortalama kare uyum istatistikleri değerlendirilmiştir. Çalışmanın protokolü Marmara Üniversitesi Sağlık Bilimleri Enstitüsü Etik Kurulu tarafından 18 Şubat 2019 tarih ve 2019-36 sayılı onaylandı.

Bulgular: Anketin kapsam geçerlik indeksi tüm maddeler için 0,80'inin üzerinde, Cronbach alfa katsayısı 0,74 olarak bulunmuştur. Test-tekrar test analizinde tüm maddeler için anlamlı farklılık saptanmıştır ($p < 0,01$). Rasch analizine göre kışı ayırma indeksi 1,57, madde ayırma indeksi ise 11,93 olarak bulunmuştur. Rasch analizine göre veriler çok yüksek madde güvenilirliği (0,99) gösterirken, kışı güvenilirliğinin (0,71) oldukça düşük olduğu belirlenmiştir.

Sonuç: Bu çalışma, Besleme Uygulamaları ve Yapısı Anketi'nin güvenilir olduğunu, örneklem nedeniyle geçerli olmadığını göstermiştir.

Anahtar sözcükler: Besleme uygulamaları, okul öncesi, ebeveyn, geçerlik, güvenilirlik

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Children need to obtain healthy eating habits in the preschool period. In addition to preventing acute nutrition-related diseases and growth problems, healthy eating habits prevent also protect against obesity, diabetes, cardiovascular disease, and stroke resulting from the long-term effects of unhealthy diets (1,2).

The basis of eating habits is formed in childhood and eating behaviors acquired in this early period continue in later years (3). Parents influence their children's nutrition status with their eating behaviors, attitudes, and beliefs concerning foods (4). Many studies show that the basis of habits acquired in the early period is formed in the family. For this reason, studies have defined the effects of parents on child nutrition as parental feeding practices (5).

When the scales developed to determine the feeding practices of the parents are examined, it is seen that there is no scale designed specifically for the preschool age group. The scales that are available target pre-school and school-age children together (6).

This study was a questionnaire adaptation study conducted to determine the validity and reliability of the Turkish version of the Feeding Practices and Structure Questionnaire administered to the parents of children aged 2-5 years. This questionnaire is used to assess feeding practices that could affect children's ability to self-regulate their energy intake.

MATERIAL AND METHODS

Study population and design

The research was carried out in kindergartens in Üsküdar, Beşiktaş and Fatih in Istanbul, Turkey between February 2019 and March 2020. The parents were randomly selected by interviewing the teachers of the kindergartens affiliated with the Turkish Ministry of National Education. The research was concluded with the participation of 314 parents.

While determining the sample size, the guidelines published on scale development and adaptation studies were examined, and it was decided that 10 people should be recruited for each scale item (7). Since the questionnaire consisted of 27 items, the study was planned to be conducted with at least 270 individuals.

Ethical approval was obtained from the Health Sciences Institute of Marmara University with the protocol number 2019-36 dated February 18, 2019. Informed consent was

obtained from all the parents of the participants included in the study. The research was conducted in accordance with the principles set forth in the Declaration of Helsinki, 2008.

Data collecting tools

Demographic questionnaire: In this form, the sex, age, marital status and educational status of the parents, parental height-body weight, and the total number of children in the family were questioned. Regarding the child, the number of children and height-body weight information were collected. Children's height and body weight information based on the parents' statements was used for the calculation of body mass index (BMI). The z-scores for weight-for-age, height-for-age, and BMI-for-age were evaluated. The z-scores were calculated as described in the Anthro Plus program of the World Health Organization (WHO, 2020) and classified as follows: <-2 standard deviation (SD), thin; ≥-2 SD- <2 SD, normal; and ≥ 2 SD, obese.

Feeding Practices and Structure Questionnaire: The original questionnaire was developed by Jansen et al. in Australia, 2014. The Feeding Practices and Structure Questionnaire aims to assess children's feeding practices that could affect their ability to self-regulate their energy intake (8). The questionnaire consists of 28 items and eight constructs, of which four are related to feeding practices and the remaining four are related to structure-related feeding practices. The constructs related to feeding practices are reward for behavior (four items), reward for eating (four items), persuasive feeding (five items), and overt restriction (four items). The constructs concerning structure-related feeding practices are covert restriction (four items), structured meal setting (three items), structured meal timing (three items), and family meal setting (one item). Since the item linked to family meal setting was removed from the original scale, it was not included in the current study. Item 3 was also excluded since its translation was complicated and caused confusion.

Parental Feeding Style Questionnaire: This instrument evaluates control, emotional feeding, conditional feeding, oppressive feeding methods and also examines the relationship between the BMI of the parent and the child (9). The questionnaire was developed by Wardle et al. and adapted into Turkish by Özçetin et al. (2010) (10).

Language Adaptation and Validation of the Questionnaire

After written permission was obtained from the scale developers and language adaptation was performed

according to the scale adaptation steps of WHO (7), the scale was translated into Turkish by three people who are fluent in both Turkish and English languages.

After the translation of the questionnaire was completed, opinions and suggestions were received from five different experts concerning whether the Turkish translation was understandable and appropriate. Item 3 was excluded from the study because it was difficult to understand. The original and translated versions of the questionnaire were sent to the experts together. The scale was re-evaluated according to the opinions and suggestions received for each item in the questionnaire and necessary adjustments were made to the items. After the questionnaire was translated back to English and all stages were completed, the Turkish version was finalized for use in the study.

Statistical Evaluation of Data

SPSS v. 23 was used for the statistical analyses of the research data, and the Rasch analysis was conducted using Winsteps v. 3.85. As descriptive statistics for demographic characteristics, mean and standard deviation values were calculated and frequency tables were constructed.

The content validity of the questionnaire was evaluated, while the internal validity was evaluated, the comparison of the upper and lower group averages of 27%, and the similar scale validity method was used when evaluating the external validity. While evaluating the internal validity of the questionnaire, the content validity analysis was undertaken, and the 27% lower and upper group averages were compared with the t-test. The external validity of the questionnaire was evaluated with the similar scale comparison method. For similar scale validity, the intra-class correlation coefficient (ICC) was calculated. The Rasch analysis was used in the validity and reliability analysis of the questionnaire. In the Rasch analysis, the mean values of 0.60 and 1.40 were accepted when the compliance tests were performed for item difficulty levels, and individual ability levels were assessed.

Cronbach's alpha coefficient and test-retest reliability were used in the reliability analysis of the scale. While performing Cronbach's alpha analysis, a value of ≥ 0.70 was taken as a reference. The paired t-test was used for the test-retest assessment. A p value of < 0.05 was accepted as the significance value.

RESULTS

Descriptive findings of the participants

The descriptive characteristics of the parents and children are given in Table 1. It was determined that 91.4% (n = 287) of the parents were the mothers of the participant children, and 98.4% of the parents were married. When the educational status was examined, most of the parents (66.2%) had graduated from university.

The mean age was 37.2 ± 3.3 years for the mothers, 35.1 ± 3.6 years for the fathers, and 3.4 ± 0.7 years for the children. When the total number of the children of the parents and the birth order of the participant children were questioned, it was determined that the majority (58%) of the parents had one child, and the child participating in the study was mostly their first (75.5%).

Findings on the validity of the adapted scale

Content, internal criterion and similar scale validity analyses were performed. The acceptable level in content validity was accepted as 0.80 and above. Accordingly, the content validity scale for all items was found to be above 0.80.

The difference between the lower and upper group means was evaluated for internal criterion validity. The data of the first and last 85 participants, who constituted 27% of the 314-person group, were evaluated to determine their differences in the independent-samples t-test for each item and examine their averages. As a result, a statistically significant difference was found for all items ($p < 0.05$).

ICC was used to evaluate similar scale validity. The ICC value was found to be 0.689, indicating that the scale was moderately reliable.

Findings on the reliability of adapted scale

Internal consistency and test-retest reliability were used for the reliability analysis. Internal consistency was evaluated by performing Cronbach's alpha analysis for each construct of the scale (Table 2). Cronbach's alpha coefficients of the scale constructs were 0.795 for reward for behavior, 0.797 for reward for eating, 0.600 for persuasive feeding, 0.563 for overt restriction, 0.844 for covert restriction, 0.310 for structured meal setting, and -0.227 for structured meal timing. Cronbach's alpha coefficient of the scale was found to be 0.740.

Table 1: Descriptive characteristics of the parents

Variable		n	%
Sex	Female	287	91.4
	Male	27	8.6
Marital status	Married	309	98.4
	Single	5	1.6
Education status	Primary school	7	2.2
	High school	43	13.8
	University	208	66.2
	Master	56	17.8
Total number of children	1	182	58.0
	2	107	34.0
	3	21	6.7
	4	4	1.3
Birth order of the child participating in the study	First	237	75.5
	Second	58	18.5
	Third	15	4.8
	Fourth	4	1.3

Table 2: Internal consistency reliability coefficients

Constructs	Cronbach's alpha value
Reward for behavior	0.795
Reward for eating	0.797
Persuasive feeding	0.705
Overt restriction	0.563
Covert restriction	0.844
Structured meal setting	0.310
Structured meal timing	-0.227
Total	0.740

According to the Cronbach alpha analysis, the constructs of reward for behavior, reward for eating, persuasive feeding and covert restriction were found to be at a reliable and acceptable level. There was no significant change in the reliability value when any item was removed from the constructs of reward for behavior, reward for eating and covert restriction. However, when Item 2 was removed from the persuasive feeding construct, the reliability coefficient of this construct increased from 0.705 to 0.715. The reliability level of the overt restriction construct was found to be very low. However, when the items of this construct were removed, the level of reliability did not change. Cronbach's alpha value for the structured meal setting construct was very low at 0.310. When Item 14 was removed, the reliability of the construct increased from 0.310 to 0.650. Cronbach's alpha reliability coefficient for the structured meal timing construct was calculated as -0.227, indicating that the items under this construct did not tend to measure the same variable and internal consistency was extremely poor.

The retest was carried out with 103 parents approximately four weeks after the first test. When test-retest reliability was examined with the paired t-test, there was a significant difference between the means of the values measured at two different times ($p = 0.001$).

Evaluation of the validity and reliability of the adapted scale with the Rasch analysis

The Rasch analysis was used to evaluate the validity and reliability of the Turkish adaptation of the questionnaire. In principle, the Rasch analysis evaluates two parameters independent of each other: the persons and the items to which the scale is applied.

Item/person separation

According to the Rasch analysis, item/person separation was calculated in two indices: item person separation index and reliability. An acceptable value of >2.00 was taken for both individual and item separation (11). The person separation index was found to be 1.57, and thus it was below 2.00. The item separation index was determined as 11.93, being above 2.00.

The acceptable range of separation reliability values is 0-1. However, to be considered significant, it must be at least 0.50 (12). The data showed very high item reliability (0.99) in the Rasch analysis. The person reliability value was very low (0.71), indicating a very unreliable person pattern. Therefore, it is considered that the questions in the questionnaire were not clearly understood by the individuals participating in the study.

Figure 1 shows the distribution of the individual ability level of the adapted scale according to the item difficulties. The values on the left of # indicate the ability of the individuals to answer the questions, and the values on the right indicate the difficulty level of the items (12). Accordingly, while Item 18 had the least negative impact on feeding practices, Item 10 was found to have the most negative effect on feeding practices.

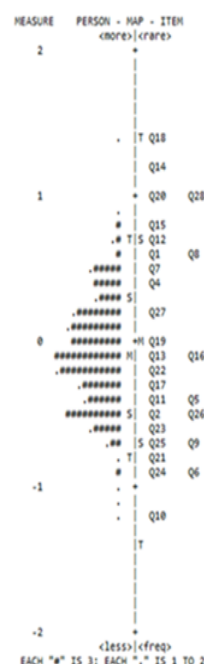


Figure 1: Person ability/item difficulty level map of the Turkish version of the Feeding Practices and Structure Questionnaire

Mean square fit statistics

In the Rasch analysis, the mean square agreement value for the 27 items was found to be 1.02 (0), and the mean square agreement value for non-conformity was found to be 1.02 (0). Since the expected value for both values is 1.00, the items were considered to be compatible.

Root Mean Square Error of Approximation – RMSEA

According to the Rasch analysis, the RMSEA value was found to be 0.06, showing that the model had a good fit (<0.10).

Balloon graphic

In Figure 2 and Figure 3, it is seen that the items are clustered and in harmony with each other.

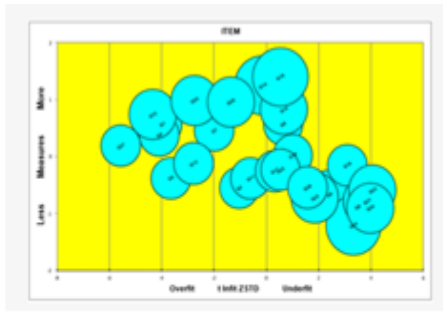


Figure 2: Representation of the infit mean square values

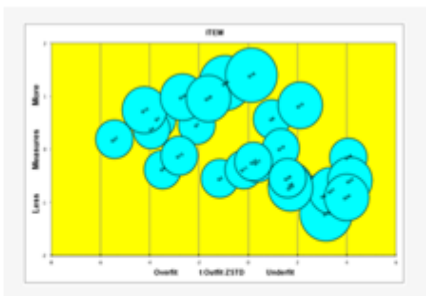


Figure 3: Representation of the outfit mean square values

DISCUSSION

Evaluation of the adapted scale in terms of validity and reliability

Scale adaptation studies include not only the translation of the scale into a different language and using it but also performing the validity and reliability analysis of the translated version (13). Intercultural scale adaptation is a set of systematic studies that require attention in adapting a scale developed in a different language into Turkish (14). The original Feeding Practices and Structure Questionnaire consisted of 28 items. However, during the adaptation process, Item 3 was considered to be not intelligible due to the confusing expression, and therefore it was not included in the Turkish version.

Cronbach's alpha coefficient and test-retest analyses were used to evaluate the reliability of the adapted scale. Cronbach's alpha, which is the internal consistency reliability coefficient, was calculated for the entire questionnaire and its constructs. The general accepted value for Cronbach's alpha is above 0.70 (13). The Cronbach alpha

value for the adapted scale was found to be 0.740, and therefore it was generally reliable. In the analyses performed for each construct, when the items with a Cronbach's alpha coefficient below the acceptable value were excluded, there was no significant increase in Cronbach's alpha values. Although it is suggested that item-total score correlations should not be negative and should not be below 0.20, there is no definite rule concerning the removal of these items from the scale (15). Since there was no significant change in Cronbach's alpha value when the items were removed, we decided not to exclude these items from the questionnaire despite the low correlation.

In the evaluation performed according to the Rasch analysis, although the item reliability of the data was at a very high level, individual reliability was very low. These results showed that the questionnaire could be administered to a similar group with the same item difficulty level; however, the applicability of a similar scale to the same group was low.

Evaluation of the adapted scale in terms of some variables

Parents influence the nutritional status of children not only through genetic transmission but also through the environment they create for their children. The level of knowledge, attitudes, and practices of both parents play a decisive role in preventing malnutrition and determining the nutritional status of children (16). The availability of food at home is affected by many factors (17). Preventing or restricting children's access to unhealthy snacks by parents are some of the restrictive feeding practices (18). In the current study, when the responses given to Item 23 (How often do you avoid buying and bringing home snacks, such as candy and potato chips?) were examined, 82% of the mothers responded as always, while 22.2% of the fathers responded as always and 44.4% as often. Concerning Item 24 (How often do you not buy the food you want to prevent your child from reaching it?), 37.3% of the mothers responded as always and 36.9% as often, while 48.1% of the fathers responded as always and 22.2% as often. With these questions, the parents' attitudes toward unhealthy foods and the frequency of having unhealthy food at home were questioned. Their responses showed that the parents avoided having unhealthy foods at home.

The use of food as a reward for preschool children, whose nutrition habits and taste preferences are still developing, is another feeding practice applied by parents (19). In the current study, when the responses given to Item 3 [How

often do you encourage your child to eat something by using the nutrients as a reward during the main meal (for example, if you finish your vegetables, you will get some fruit)?] were examined, 27.8% of the mothers responded as always whereas 44% of the fathers responded as sometimes. In relation to Item 19 (I reward my child with something to eat when he behaves well), 66.9% of the mothers and 55.6% of the fathers responded as never. Although the reward method is used frequently as also reported in a previous study (19), our results also showed that restrictions were applied more than rewards.

CONCLUSION

In this study, the Turkish adaptation of the Feeding Practices and Structure Questionnaire was determined to be reliable; however, it is not possible to state that it was valid due to the characteristics of the sample according to the Rasch analysis examining participants' responses to items by associating them with the difficulty level of each item. The balloon chart showed that the individuals could not clearly distinguish between the constructs and the items were not clearly clustered under each construct. Similarly, the person separation index was 1.57, which is below the acceptable value of >2 , and individual reliability was found to be weak at 0.71.

DECLARATIONS

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Conflicts of interest: None of the authors has any conflict of interest to declare.

Ethics approval: The protocol of the study was approved by the Ethics Committee of Marmara University Health Sciences Institute with the number of 2019-36 dated February 18, 2019.

Authors' contributions: Ece Moral Yılmaz and Şule Aktaç equally contributed to the design and implementation of the research, analysis of the results and writing of the manuscript.

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