Original Article

Validity and Reliability of Parental Health Literacy Activities Test

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Abstract

Background: The studies have reported that there is a correlation between health literacy levels of adults and health outcomes of children

Aim: The study was conducted to analyze the validity and reliability of the Parental Health Literacy Activities Test (PHLAT-8) in Turkish society.

Methodology: The sample included randomly selected 146 parents, and the data were collected between December 2014 and January 2015. Kendall W Analysis, Kuder-Richardson Formula 20, and Mann-Whitney U test were used to evaluate these data.

Results: The internal consistency of the Parental Health Literacy Activities Test (PHLAT-8) was measured with Kuder-Richardson Formula 20, and the alpha value was KR-20=0.68. The difference between the mean scores of the parents in the lower group and upper group was statistically significant (U=4.500, p=0.000).

Conclusions: The Parental Health Literacy Activities Test (PHLAT-8) is a valid and reliable test that can be used in Turkish society. The test can be used to provide an objective standard for future studies.

Key words: nursing; parents; health literacy; validity; reliability.

Introduction

According to the Joint Commission, health literacy plays a key role for quality and safety in health. According to the 'Health Literacy around the World' report published by the World Health Organization, general health literacy levels of member states of the European Union vary among countries and while the levels between 29% and 62% are inadequate and problematical, the levels between 2% and 27% are inadequate. The rate of inadequate health literacy is 30.9% in Turkey. These rates are far behind the European average (Karaman, 2019; WHO, 2019). Yin et al., (2009) indicate that only 15,1% of parents in the United States of America have adequate health literacy levels. The studies have reported that there is a correlation between health literacy levels of adults and health outcomes of children (Berkman et al., 2004; Yin et al., 2009, 2010/a). Low health literacy may cause bad health behaviors and consequences. Health literacy level is important especially for parents of infants with a higher potential of suffering from errors due to their developmental characteristics. Health literacy levels of these parents affect their behaviors of seeking and receiving help for their children's health and adjustment to the anticipated medical interventions (Pati et al., 2010; Kumar et al., 2010). Parental health literacy is important for basic infant care, home medication, medical treatment and health care. Recent studies have revealed that focusing on parental health literacy may reduce infants' care obstacles (Yin et al., 2010/b; Wynia et al., 2010; Mackley et al., 2016; Freedman et al., 2012). In Turkey, there are scales used for assessing health literacy levels of adults; however, the only scale used for determining health literacy levels of parents with infants in parental tasks is Parental Health Literacy Assessment Test (PHLAT 8).

Methods

The present study was conducted descriptively to determine validity and reliability of the Turkish adaptation of the 'Parental Health Literacy Activities Test 8, which was developed to measure health literacy levels of parents. The

study was conducted in pediatric outpatient clinics and inpatient pediatric units of four hospitals. Literate parents with children aged 0 to 1 year were included in the study; whereas, parents who had a hearing, seeing or mental impairment were not included. In scale studies, it is recommended that the sample number is 5-10 times greater than the scale item number (Gozum & Aksayan, 2002). Accordingly, while 40 parents would be enough for the sample; the study was completed with 146 parents in total. In order to adapt the scale into Turkish, approval of Disha Kumar was taken. In order to complete the study, ethics committee approval and institutional permissions were received. Parents meeting the inclusion criteria were informed about the purpose of the study and then their consent was received. The data were collected using the 'Socio-Demographic Characteristics Data Collection Form' (eight questions about age, sex, education, occupation, income, number of children, chronic illnesses and taking a lesson from health) and the **'**Parental Health Literacy Activities Test 8'.

Parental Health Literacy Activities Test 8: Parental Health Literacy Activities Test is a shortened version of the PHLAT-10 designed via psychometric analysis. PHLAT-8 is a tool for assessing health literacy levels of parents. The aim of the test is to determine knowledge levels of parents concerning infant feeding, food allergy and accurate adjustment of medication doses. The original English version consisting of 20 items (PHLAT) has been revised by the version consisting of 10 items (PHLAT-10) afterwards. Just like in the version adapted into Spanish, images and labels of boxes related to the drugs and formulas number 2 and 3, have been prepared as Turkish forms. Each image and label have been adapted from the products used by parents in child care. Images and labels used are the forms of original products that are sold in Turkey. Parents are asked to answer each question by reading and examining this material. The test can be done either in written or orally. Kumar et al. (2010) has prepared instructions individually for both written and oral application processes. Question answered correctly is coded as ` **1** ` point, while question answered wrongly is coded as ` **0** ` point. At the end of the test, 4-6 questions answered correctly are expressed as "adequate" literacy level, 2-3 questions "limited" literacy level and 0-1 question "inadequate" literacy level.

Procedures in the Scale Adaptation Process : In the adaptation process, "translation" and "back translation" methods were used. Two translators translated from English into Turkish. Then, the translations were reviewed and arranged by the researchers and a common translation text was formed. Final form of the translation, which was performed with group work, was made ready-to-use in the study by consulting an expert English linguist. The Turkish version of the scale was translated back to English by a third linguist. Opinions were received from three expert academicians from the department of nursing for language, content compliance, and comprehensibility of the scale items which were fully translated. The experts were given both the original version and translation of the scale and were asked to assess each item by scoring them between 1-4 (1=Not Concordant, 4=Completely Concordant). As a result of assessing the scale questions and drug and formula images, no item was omitted from the scale and the images were found to be concordant. Preliminary application of the scale was completed with 15 parents who had characteristics similar to the sample but they were not included in the sample. Following the application, each parent was interviewed individually and comprehensibility of the scale items was assessed. Majority of the parents stated that the second item was not comprehensible. Expert opinion was received for this item and it was made comprehensible.

Data Collection : The study was completed between December 2014 and May 2015. The data were collected in a silent environment where parents could feel comfortable. Firstly, parents were asked to read the questions on top of the page and then read and examine the image containing the drug or formula box at the bottom of the page and answer each question by performing mathematical operations when necessary. This took about 30 minutes.

Data Assessment : The Kendall's W analysis for assessing concordance among the experts; Kuder Richardson 20 formula for calculating the internal consistency coefficient of the scale; Pearson's Correlation analysis for item total score correlation, and Mann-Whitney U test for upper-lower group comparisons were used.

Results

The mean age of parents was 32.4 ± 5.4 (19-43 year-old), 41.3% of them graduated from university, and 48.6% of the parents had only one child (Table 1). The mean age of parent's

youngest child was 7.4 months (SD 4.2). Approximately 1 in 3 parents (32.6%) had inadequate or limited health literacy.

Reliability Analysis: The internal consistency coefficient alpha value of the scale was KR-20=0.68. It was determined that item-total score correlation coefficients (Pearson Product-Moment Correlation) of the scale were between 0.31-0.81 and statistically significant ($p<0.001$; Table 2). Among the scale items, while the item answered correctly the most was the fourth item and the item answered correctly the least was the second item (Table 3).

Validity Analysis

Content Validity : As a result of the analysis which was performed for concordance among the experts, the Kendall W coefficient was found to be 0.481 p= 0.182 in the analysis performed among the experts for language-expression validity and 0.453 p=0.218 for content compliance. The results showed that there was concordance among the experts.

Construct Validity (Comparison with Familiar Groups) : Scale mean score was found to be 3.6 ± 1.6 for parents in the lower group and 6.8 ± 0.9 for parents in the upper group. The difference between scale mean scores of parents in the lower and upper groups was statistically significant in an advanced level (U=4.500, p=0.000). (Table 4)

Table 1. The characteristics of parents (n=146)

Variables	n (%)
Age	
20 years and under	5 (3.4)
21-30 years	64 (43.9)
31-40 years	70 (47.9)
40 years and over	7(4.8)
Education	
Primary school	52 (35.6)
High school	34 (23.3)
University	60 (41.3)
Income	
Lower income level	66 (45.3)
Middle income level	24 (16.5)
Higher income level	56 (38.2)
Child number	
One	71 (48.6)
Two	51 (34.1)
Three and more	24 (17.3)
Chronic disease	
No chronic disease in family	106 (72.3)
Mother	22 (15.6)
Father	10 (6.7)
Children	8 (5.4)

Table 2. Item total correlation of PHLAT-8

Items	r	p
Item 1	0.75	0.000
Item 2	0.41	0.000
Item 3	0.68	0.000
Item 4	0.37	0.000
Item 5	0.81	0.000
Item 6	0.59	0.000
Item 7	0.31	0.000
Item 8	0.55	0000

Table 3. PHLAT-8 Answer Ratios (n=146)

Items	Task	Wrong n (%)	True n (%)
Item 1	Follow the instructions to prepare product	56 (36.6)	90 (62.4)
Item 2	Follow the instructions to prepare product	86 (58.4)	60 (41.6)
Item 3	Follow the instructions to prepare product with a measuring spoon	45 (29.0)	101 (71.0)
Item 4	Interpret to product's information	28 (18.7)	118 (81.3)
Item 5	Follow the instructions to prepare product with a syringe	52 (33.8)	94 (66.2)
Item 6	Interpret to product's information	38 (25.7)	108 (74.3)
Item 7	Interpret to product's information	58 (39.7)	88 (60.3)
Item 8	Interpret to leaflet	88 (60.3)	58 (39.7)

Table 4. Comparison of mean score in lower-upper group

Group	n	X	SD	U	p
Lower group	73	3.6	1.6		
Upper group	73	6.8	0.9	4.500	0.000

Discussion

The first step to reach globally targeted child health is diagnosis. Health literacy levels of parents are important in protecting and promoting the health of pediatric population, which has a risk of suffering from errors three times greater due to their developmental characteristics. Presence of standard measurement tools in identifying health literacy levels of parents is important for providing a language unity and developing common strategies. Thus, this study was conducted to determine validity and reliability of the Turkish adaptation of the PHLAT-8 scale. The scale to be used in measuring tangible or intangible features should be a standard assessment tool. In order for the scale to be standardized and be capable to produce appropriate information afterwards, it is required to have two basic features described as "reliability", which is an indicator of determination of measurement values, and "validity", which is an indicator of accurate measurement of the feature targeted to be measured (Ercan & Kan, 2004).

Internal Consistency Analysis : In the study, in line with directives by Kumar et al. (2010) who developed the scale; the scale items were assessed by giving "1" point to questions answered correctly and "0" point to questions answered wrongly or not answered at all. In this study, it was found that KR-20= 0.68. Yin et al. (2012) found that internal consistency analysis of the PHLAT-8 was KR-20= 0,64 in Spanish parents with infants in age period of 0-1 year. The internal consistency coefficient of the scale shows a concordance with the original version. Item-Total Score Analyses : In the study, it was seen that there was a positive correlation between the variables. When there is no correlation, the coefficient approximates zero and when there is a strong correlation, the value found approximates 1, which is the absolute value (Altas et al., 2012). In significance level; (+) indicates a positive correlation, whereas (-) indicates a negative correlation (Boyacioglu & Guneri, 2006; Streiner et al.,2015). As a result of the analysis, it was determined that Pearson Product-Moment Correlation of the eight-item scale was statistically significant at the level of p<0.001 and in the range of 0.31-0.81. In general, it is indicated that items distinguish individuals better at an item-total correlation of 0.30 and higher; the values between 0.20 and 0.30 can be included in the scale when compulsory and items below 0.20

should be omitted from the scale (Buyukozturk, 2007; Streiner et al. 2015). In the present study, as there was no scale item with a correlation coefficient below 0.30, none of the items were omitted from the scale.

Content Validity : Content validity signifies to what extent the scale and each item in the scale serve the purpose as a whole (Ercan & Kan, 2004). In scale development studies, content validity rates are applied in case that experimental applications are not possible. Content validity rates are a method used for transforming qualitative studies based on expert opinions into statistical quantitative studies (Boateng et al, 2018). In this study, opinions were received from three experts to assess language/expression concordance of the PHLAT-8 test which was translated into Turkish and each scale item was reviewed and arranged according to their suggestions. Concordance among the experts was assessed via the Kendall's W concordance coefficient. The Kendall's W coefficient has a value ranging from '0' to '1'. If the coefficient is '0', it indicates that there is no concordance among the experts and if it is "1", it indicates that there is an excellent concordance among the experts (Siegel & Castellan, 1988). As a result of the analysis performed for concordance among the experts in the present study, it was determined that the Kendall W=coefficient was 0.481 (p=0.182) for language/expression validity and 0.453 (p= 0.218) for content concordance. The results showed that there was a moderate concordance among the experts. It was agreed that discourses in the scale were appropriate for the culture and could be used for determining health literacy levels of parents. **Construct Validity (Comparison with Familiar Groups) :** The Mann Whitney U test is used to test whether the two unrelated groups are similarly distributed in the population in terms of the related variable or not (Boateng et al., 2018). In the study, the scale mean score was found to be 3.6 ± 1.6 for parents in the lower group and 6.8 ± 0.9 for parents in the upper group. The difference between scale mean scores of parents in the lower and upper groups was found to be statistically significant in an advanced level (U=4.500, p=0.000). This finding indicated that the scale had an advanced power of distinguishing parents with adequate health literacy levels from parents with inadequate health literacy levels.

In summary, the Turkish version of the PHLAT 8, like its English and Spanish versions, might be a reliable and valid measuring instrument for assessing health literacy levels of parents with infants.

Limitations of the Study: The study was conducted mainly in inpatient units in outpatient clinics of the hospitals included in the sample, as patients' examination turn would come faster and there was lack of adequate time to answer the scale questions. Each data was completed in averagely 20-30 min by conducting face-to-face interview with parents and meanwhile, distractions and interruptions occurred since infants were crying or medication hour was approaching.

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