Current Issues

Reliability and Validity of The Family Needs Scale In A Turkish Population

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KEY WORDS

children
disability
family
needs
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Aims and objectives: *This study aimed to adapt an English version of the survey tool Family Needs Scale (FNS) for Turkish patients and to evaluate its psychometric properties.*

Background: *Social care providers can reduce the risk for dysfunction in low-income families of preschoolers and increase resilience by responding to needs identified by the families themselves. Quality instruments developed to identify family needs within this population are scarce. To measure the needs of families with disabled children effectively, valid and reliable instruments that are sensitive to parents' expectations and to the constructs of nursing must be used.*

Conclusions: *Nine factors were detected in the results, Cronbach's α reliability coefficient was .95 and item–total point correlations were between .32–.81. In addition, it was found that the test–retest correlation value was .91, which was found to be statistically significant ($p < .001$).*

Relevance to clinical practice: *This scale can be used in nursing research projects to evaluate family needs regarding the care of children with a disability.*

Introduction

During the last several decades, the decline in childhood mortality and the rise in childhood chronic diseases have resulted in approximately 33% of non-institutionalized children experiencing a special healthcare need (JAMA, 2011). According to the most recent census taken in Turkey in 2008 (Turkey Health Department Report, 2008), 12.29% of the entire disabled population is intellectually disabled. Consequently, the focus of health care has shifted from mere survival to quality of life. Children with special healthcare needs include those with a chronic medical condition or permanent impairment that is associated with an increased need for health care. Central aspects of quality of life are related to psychosocial needs and role functioning—including emotional state, relations with others, independence, and productivity (Park, Turnbull & Turnbull, 2011; Upton, Lawford & Eiser, 2008). Ensuring and improving the quality of life of children with disabilities necessitates understanding their psychosocial functioning and how it is associated with the child's condition and family characteristics.

Previous research documents that the special child care demands faced by the parents of children with disabilities can cause them significant stress and considerable disruption in family relationships. These demands persist throughout childhood and into the adult years, and require continuous adaptation by the parents to both ongoing stressors and frequent crises (Hastings, Beck & Hill, 2005; Chang and Hsu 2007, Doege, Aschenbrenner, Nassal, Holtz & Retzlaff, 2011; Gona, Mung'ala-Odera, Newton & Hartley, 2011).

Social care providers can reduce the risk for dysfunction in low-income families of preschoolers and increase resilience by responding to needs identified by the families themselves. Quality instruments developed to identify family needs with this population are scarce. Valid and reliable instruments that are sensitive to identifying the needs of families with disabled children must be used. The literature describes questionnaires and specific scales for family needs, but adequate Turkish-language instruments are scarce (Sari & Basbakkal, 2008; Sucuoglu, 1995). Therefore, suitable Turkish-language instruments need to be developed or adapted for the Turkish population.

In this article, reliability and validation evidence on the Turkish translation of the Family Needs Scale (FNS) are presented. The importance of performing such a validation study lies in the presumption that the translated FNS can assess family needs accurately only when the scale is reliable and valid for the population under study. The focus of this article was to examine the factor structure and psychometric characteristics of the FNS developed originally by Dunst, Cooper, Weeldreyer, Snyder and Chase (1988) with low-income preschoolers' families (Dunst et al., 1988). To date, the results of using this scale with this population have been promising; however, ongoing psychometric exploration is appropriate with all psychosocial instruments (Brassard & Boehm, 2008).

Method

Design

This methodological study was conducted in rehabilitation centers in Erzurum, Turkey. The study phases were: (1) translation of the Family Needs Scale (FNS) into the Turkish language from the English version and back-translation into English; (2) content analysis by a panel of specialists; and (3) pretesting and psychometric testing (factor analysis, a reliability coefficient and inter-item correlations).

Participants

The sample comprised 206 parents of preschool- and elementary-aged children with disabilities or delays and children at risk for poor developmental outcomes which were being treated in rehabilitation centers. The participants were not grouped and half (n = 103) of the participants were asked to complete the scale for test–retest after 2 weeks. The researchers recruited patients to participate in the study who met the following eligibility criteria:

- able to read and understand Turkish
- able to complete the questionnaire
- living in the Erzurum city center
- no psychiatric history
- willing to volunteer to complete the scale.

Initial Translation into the Turkish Language

Translation of the FNS was carried out by two Turkish individuals who worked independently on the translation. Both were lecturers involved in teaching English and who were native Turkish speakers. The two translated versions were compared by the author and analyzed until there was a consensus regarding the initial translation.

English Version

The initial translation into Turkish was subsequently back-translated into English by two different bilingual independent translators who were Turkish. Neither of these participated in the previous phase of the study. The purpose of the translation phase was to check for discrepancies between content and meaning of the original version and the translated instrument. All the versions were analyzed and compared by the author and a final version resulted.

Content Validity

To test item clarity and content validity, the translated version was submitted to 10 nursing specialists who were informed of the measures and concepts involved. Experts were asked to evaluate each item on a five-point scale where 1 = "almost never," 2 = "seldom," 3 = "sometimes," 4 = "often," and 5 = "almost always." Later, the scale was back-translated to English by an English teacher and the scale was viewed by the experts. The experts suggested minor changes in wording and the translated scale was revised accordingly.

Finally, 10 specialists reviewed the comprehensibility of the scale to determine its language validity.

Pre-Test

Once the translated instrument was developed, a pilot study using subjects selected from the target population was undertaken to test the psychometric properties of equivalency, reliability and score distribution. An analysis of score distribution is particularly important in cross-cultural research because cultural biases often influence responses in language usage (Seker & Gençdogan, 2006). A total of 206 parents of disabled children who were treated in rehabilitation centers in Turkey were the study participants. The final version of the translated instrument was applied to a small pilot group consisting of 20 participants to pretest the instrument. Following the pretest, none of the Turkish words in the scale were changed.

Psychometric Testing

Internal Consistency and Homogeneity. Item analysis was conducted to select items that were highly correlated with each other in each scale and to also reduce the number of items as much as possible, without decreasing internal consistency. The quantitative data were analyzed by using the SPSS/PC 11.0 Windows Package Program (SPSS Inc., Chicago, IL), and Cronbach's α was calculated by means of the reliability option. This resulted in a Cronbach's α of .92. The item–total correlation had to be larger than .30 and the value of Cronbach's α should not decrease substantially when an item is dropped. Item deletion started with the item with the lowest internal correlation. When this item was deleted, internal consistency was re-estimated and the item with the next lowest item–total correlation was then deleted (Karasar, 2011).

Stability. The stability of the scale was established by measuring the test–retest reliability. In this study the respondents were sent the same instrument after approximately 2 weeks with the request to complete it again. Based on a code each respondent received, the data relating to the first and second measurement could be detected and

matched. Then, by means of the intra-class correlation coefficient (ICC), the test–retest reliability could be calculated.

Construct Validity

The data were analyzed by means of factor analysis, more precisely, a principal component analysis and varimax rotation were carried out. To attain the best-fitting structure and correct number of factors, the following criteria were used: Eigen values higher than 1.0, factor loadings higher than .40, and the so-called elbow criterion regarding the Eigen values (Norman & Streiner, 2008; Tuffery, 2011). Before conducting the factor analysis, the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Bartlett's Test were conducted to evaluate whether the sample was large enough to perform a satisfactory factor analysis. A KMO value greater than .5 indicates that the sample size is adequate for factor analysis (Tashakkori & Teddlie, 2010; Tuffery, 2011).

Ethical Considerations

Permission to use the FNS in this study was obtained from the developers (Dunst et al., 1988) before commencement. The study was approved by the Ataturk University Ethics Committee and informed consent was obtained from each participant. The study was also approved by the hospital administration. Families were invited to participate in the study and were fully informed before verbal and written consent were obtained.

Results

The study phases comprised translation of the FNS into the Turkish language from the English version and translation into English; content analysis by a panel of specialists; and finally, pretesting and psychometric testing (factor analysis, a reliability coefficient and inter-item correlations).

Research Population

The characteristics of the sample (N = 206) are summarized in Table 1. In the sample, 35.3% were aged between 45 and 66 years, most of the participants were women. Most had graduated with a primary school education (61.7%), although 6.8% had a secondary school education, 9.2% had completed their high school education, and 22.3% indicated they only knew reading and writing; 62.1% had low economic status.

Content Validity

The translated scale, consisting of 41 items, was reviewed by the expert panel for its relevance and the phrasing of the items. For each item, the experts could suggest possible improvements in phrasing. Subsequent revisions of the Turkish version were made and discussed again by the panel members until agreement on content was reached.

Table 1. Characteristics of Participating Parents (n = 206)

Characteristics	Mean ± SD
Age (years), *n* (%)	51.70 ± 9.55
Gender, *n* (%)	
Male	13 (6.3)
Female	193 (93.7)
Education level, *n* (%)	
Only know reading and writing	46 (22.3)
Primary school	127 (61.7)
Secondary school	14 (6.8)
High school	19 (9.2)
Economic status, *n* (%)	
High	17 (8.3)
Middle	61 (29.6)
Low	128 (62.1)
Marital status, *n* (%)	
Married/cohabiting	166(80.6)
Alone	40 (19.4)

Internal Consistency

The data were analyzed with the statistical computer program SPSS/PC and Cronbach's α was calculated by means of the reliability option. This resulted in a Cronbach's α of .95. If any item was deleted the Cronbach's α did not increase, so none of the items were deleted from the final scale. Pearson's product-moment correlation of the scale's items ranged from a minimum value of .32 to a maximum value of .81.

Stability

Fifty percent (n = 103) of the research population complied with the request to complete the scale for the second time after 2 weeks. The ICC was determined to evaluate the test–retest reliability between the two measurement sessions: ICC = .91 ($p < .001$).

Construct Validity

Before factor construction of the scale could be observed, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy tests and Bartlett's Test of Sphericity were calculated (Norman & Streiner, 2008). Analyses showed that the KMO was .85,

indicating that the sample was large enough to perform a satisfactory factor analysis and that the sample size was sufficient for psychometric testing of a 41-item scale. The Bartlett's test was 8237.39; it found that the results of both tests were statistically significant at the level of $p < .0005$ and were satisfactory for factor analysis.

Using SPSS/PC a principal component analysis (PCA) was completed. The PCA revealed nine factors with an Eigen value higher than one. The post-rotational variances of the factors were 43.03%, 9.99%, 5.23%, 3.50%, 3.18%, 2.91%, 2.88%, 2.67%, 2.51%, respectively. The nine factors all together explained 75.93% of the variance (Table 2).

The factor loadings were between .90 and .41 (item 5 and item 41) and, because the factor loadings were all above .40, none of the items were deleted from the scale (Table 3). After the factor analysis we gave the following names to the nine factors:

Factor 1: Primary needs
Factor 2: Future planning for child
Factor 3: Specialized child care
Factor 4: Transportation
Factor 5: Rest needs
Factor 6: Financial resources
Factor 7: Employment
Factor 8: Nutrition of child
Factor 9: Budgeting

Discussion and conclusion

Our aim was to test the reliability and validity of the FNS and to demonstrate its applicability for Turkish people. The reliability of a scale refers to the extent to which it is internally consistent. Reliability was assessed by using item–total scale correlations and Cronbach's α coefficients. The desired criteria of item–total correlation were > .30, and alpha levels of .80 or greater were considered desirable, with .70 or above viewed as adequate (Karasar, 2011). In this study, correlations between single items ranged from .32–.81, and the internal consistency of the FNS assessed by Cronbach's α was .95. These results were similar to the original scale (Dunst et al., 1988) where Cronbach's α was .95.

Looking specifically at the items in the Turkish scale compared with the original scale, it appears that cultural characteristics may have been an influencing factor. This also calls into question the KMO procedure. The KMO was .85, indicating that the sample was large enough to perform a satisfactory factor analysis and that the sample size was sufficient for psychometric testing of a 41-item scale.

The PCA revealed nine factors with an Eigen value higher than one. After the factor analysis, these nine factors were named as: (1) Primary needs, (2) Future planning for child, (3) Specialized child care, (4) Transportation, (5) Rest needs, (6) Financial resources, (7) Employment, (8) Nutrition of child, and (9) Budgeting. These results were similar to the original scale (Dunst et al., 1988). Fifty percent ($n = 103$) of the research population complied with the request to complete the scale for the second time after 2 weeks. The test–retest correlation value was .91, and this was found to be statistically significant ($p < .001$).

Our results showed that the validity and the reliability of the FNS are extremely high, and it is an adequate measurement scale to determine family needs. In conclusion, the Turkish version of the FNS has shown statistically acceptable levels of reliability and validity.

The scale can be used to identify family-identified needs with disabled children and the responses on the scale can be used to prompt descriptions of the conditions that influence a respondent's assessment of his or her needs. Discussions that center around the responses on the scale can help clarify concerns and help define the precise nature of the family's needs. Cultural factors, including biases in response rates, need to be addressed not only for this instrument, but also in statistical testing. Cross-cultural influence in health behaviors can only be meaningfully studied with reliable and valid instruments. A recommendation is that this scale should be further evaluated with a large enough sample size, in different regions in Turkey and diverse populations worldwide. Once a valid and reliable scale is ready for use, it can be used to measure outcomes in an intervention study.

Table 2. The Results of the Principal Component Factor Analysis for ASNP ($n = 600$)

Factor number	Eigenvalue	Percentiles of variance	Cumulative percentiles
1	17.64	43.03	43.03
2	4.09	9.99	53.02
3	2.14	5.23	58.25
4	1.43	3.50	61.75
5	1.30	3.18	64.94
6	1.19	2.91	67.85
7	1.18	2.88	70.74
8	1.09	2.67	73.41
9	1.03	2.51	75.93

Table 3. Factor Loadings for the FSN(*n* = 206)

	Factor loadings in FSN							
Factors								
Primary needs	.892							
	.847							
	.804							
	.762							
	.720							
	.634							
	.623							
	.600							
	.541							
	.533							
Future planning for child		.779						
		.692						
		.689						
		.641						
		.603						
		.569						
		.553						
		.540						
		.493						
Specialized child care			.769					
			.733					
			.730					
			.698					
			.694					
			.618					
			.577					
			.432					
Transportation				.768				
				.759				
				.518				
Rest needs					.714			
					.499			
Financial resources						.759		
						.645		
						.475		
						.415		
Employment							.703	
							.619	
Nutrition of child								.583
								.558
Budgeting								.905

What is already known about the topic

- Family needs have been related to treatment of disabled children.
- Qualitative analyses repeatedly demonstrate the importance of families.
- Pilot testing of the Family Needs Scale provided an initial psychometric evaluation in families with disabled children.

What this article adds

- Construct validity of the Family Needs Scale was further supported in a sample of families with disabled children
- Family needs as an outcome of nursing care processes can be evaluated by the instrument.
- After further validation of the scale, nurses could use it to identify the specific needs of communities in which they are working and to develop family health care programs that respond to those needs.

Limitations: This scale should now be further evaluated with a larger sample size, in different regions in Turkey and with diverse populations. The FNS should be checked with variables that affect family needs.

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Contributions

Study design: G. I. Coban, S. Bilgin, D. Tanriverdi; data collection and analysis: G. I. Coban; and manuscript preparation: G. I. Coban.

Conflict of interest

There was no conflict of interests in the preparation and writing of this article.

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