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The needs of children questionnaire – Turkish cross-cultural adaptation

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ABSTRACT

Introduction and aim. Determining the needs of children hospitalized for treatment is important in terms of identifying children who are more at risk and developing support systems for the child and the family. We aimed to test the validity and reliability of the Turkish needs of children questionnaire (NCQ) and cross-culturally adapt it to the Turkish language.

Material and methods. This cross-sectional study was conducted using a total of 160 children aged 5-16 years who were hospitalized between May 2021 and May 2022. The linguistic, content validity, construct validity, and internal consistency of NCQ were assessed.

Results. NCQ had a four-factor structure consisting of two categories and explained 76% of the total variance. The Cronbach's alpha coefficients were 0.748, 0.799, 0.821, and 0.802 for the subscales of Caring, Information, Activities, and Relationships, respectively; and 0.893 for the total score. Inter-item correlations ranged from 0.149 to 0.702 ($p<0.05$).

Conclusion. NCQ has a high level of validity and reliability for Turkish society. Turkish children aged 5 to 16 years were able to comprehend this instrument and express their needs and feelings about their hospitalization period.

Keywords. children, hospital, reliability, Turkey, validity

Introduction

Physical, behavioral and psychological differences of children, their continuing growth and development, and their need for adults to meet their basic needs even when they are healthy increase the importance of healthcare provided by pediatric health professionals in determining and meeting children's needs when they are hospitalized.[1,2] Disease-and-treatment-related variables, child's own characteristics and familial factors are significant determinants on their compliance with hospital conditions and their level of psychological exposure to these conditions.[3,4] According to the developmental biopsychosocial model, biological factors, developmental characteristics, psychological factors, risk factors associated with the disease, and social factors have significant roles in the child's reactions to illness and treatment.[5]

Hospital setting is a foreign setting for a hospitalized child. The child has no information about the hospital, health professionals, the equipment used at the hospital, and procedures to be applied. In addition, in hospitalization process, school-age children, just as other children, have various needs such as not falling behind in their academic life, doing activities, playing games, getting information about the procedures applied, having their parents by their side, establishing effective communication with them, and meeting their emotional needs. Meeting these needs is important in terms of supporting the child's development and improvement of his/her individuality.[6–8] By determining the needs of children receiving inpatient treatment, children who are at higher risk can be recognized more easily and relevant support systems can be developed for them and their family.

Thus, traumatic effects of illness and hospitalization on children can be minimized.[9] Due to changing social and cultural values over time, advancing treatment modalities, and increasing technological opportunities, this subject is up-to-date and open to change in every period and should be understood well enough to meet the needs of hospitalized children.[10] By determining needs of children, an optimal efficiency can be obtained in pediatric treatment and care, improving their well-being.[11] To maximize children's positive healthcare experiences, a questionnaire is required to assess whether the quality of care in hospitals is consistent with what children perceive as important and necessary.[12]

Self-report is the best assessment method in children and is considered the gold standard.[13,14] In today's modern world, children still have high levels of anxiety/fear/psychosocial problems due to hospitalization, leading researchers to discover new assessment methods for children.[11] There is a need for self-report scales for children, considering their developmental characteristics.[12]

The needs of children questionnaire (NCQ) was developed by Foster et al. in English language.[15] The scale was developed in order to determine the psychosocial, physical, and emotional needs of school-age children (aged 5-16 years) hospitalized in pediatric services based on self-report. Psychometric properties of the questionnaire were evaluated after school-age children completed their needs in four pediatric categories in Australia and New Zealand. These categories are Caring, Information, Activities, and Relationships. The NCQ was developed between 2013-2017 in three stages. Content adequacy evaluation, questionnaire management, factor analysis, internal consistency evaluation, and construct validity were performed. The NCQ was firstly tested by Foster et al. in Australia and New Zealand.[15] The scale was finalized as a 16-item 4-category scale. The Cronbach's alpha coefficient for combined samples was 0.93.

It reports as easy to use and useful. In this context, it is the first questionnaire in which the needs of hospitalized children are determined and their fulfillment is evaluated.[15] To the best of our knowledge, there is no easy-to-use scale in Turkish based on self-report of children hospitalized in pediatric services by which their psychosocial, physical, and emotional needs are evaluated. A tool that is culturally and developmentally appropriate, valid, and reliable can contribute to the determination of the needs of Turkish children hospitalized in pediatric services.

Aim

We aimed to cross-culturally adapt the NCQ that is used to determine the psychosocial, physical and emotional needs of school-age children based on their own self-reports into the Turkish and test the validity and reliability of its Turkish version. The research questions:

– Is the Turkish version of the Needs of Children Questionnaire (NCQ) instrument a valid instrument?
– Is the Turkish version of the Needs of Children Questionnaire (NCQ) instrument a reliable instrument?

Material and methods

Ethical approval

An ethical approval was obtained from an ethics committee of a university (IRB number: 2021-SBB-0249, Decision no: 9, Date: 31.05.2021). Permission was obtained from Mandie Foster, who developed the scale, via e-mail to use the scale in the study. We obtained a written consent from parents of the children included in the study.

Participants

The cross-sectional study study was conducted with the participation of children aged between 5-16 years who were hospitalized in Bartin Obstetrics and Pediatrics Hospital located in the West Black Sea region of Turkey. In scale improvement studies, the sample size should be 5-10 times of the total number of scale items used in the study.[16] We used normative sample in this current study. The normative sample is the sample from which norms are obtained and consists only of a part of individuals from a reference population. The reference population refers to a larger group of people, to whom the analytic sample is being compared.[17] Therefore, as the NCQ consists of 16 items, a total of 160 children (other than those used in the pre-application) who met the study inclusion criteria were included in the sample. Study inclusion criteria were as follows: (1) being a child aged between 5-16 years old who can communicate in Turkish well and (2) being hospitalized for more than 24 hours (3) agreeing to participate in the study (4) having a parental approval to participate in the study.

Data collection

We collected data after the children and the parents were informed about the purpose of the study and the confidentiality of the data. The children were asked to complete the questionnaire on their last day in hospital. The Descriptive Information Form and The Needs of Children Questionnaire were the data collection tools.

Descriptive information form

This form includes questions about children's age, gender, length of hospital stay, chronic disease, hospitalized clinic, age and education level of caregiver.

The needs of children questionnaire (NCQ)

It consists of 16 items and two subscales: importance and fulfilment. This is a three-point Likert type scale, scoring as 3=very important/always, 2=important/sometimes, and 1=not important/never. Scores ob-

tained for each item are summed up to find total scale score. A higher scale score indicates greater perceived importance and fulfilment.

Cross-cultural adaptation
We used the guide for the cross-cultural adaptation of self-report scales. Our steps were translation, semantic (semantic) annotations, expert panel, pilot study and cognitive review, having prefinal form and adaptation process.[16,18]

Translation
The scale was translated by two bilingual (fluent in Turkish and English) translators independently from the study. Each of the translators performed this process separately. Later, the translators gathered their own translations and exchanged ideas until they came up with a common product. Two translators then translated the questionnaire back into its English, completely blind to the original version.

Back translation
The back translations were produced by two persons who able to speak both languages (Turkish and English) and are non-experts. The reason for applying this method is to find problematic words and to prevent inferences that professional translators can make. When consensus was reached, the draft scale was produced for the next step.[16]

Synthesis
The two translators came together to synthesize the results of the translations. Starting from the original form, in addition to the translations of the first translator and the second translator, first a synthesis of these translations was made (a co-translation was produced). In the process, consensus was achieved on each of the issues addressed and how they were resolved, with a written report carefully documenting the synthesis process.[16]

Expert committee review
The scale was presented to expert opinion for scope and content validity. Nine expert opinions, including four faculty members from the department of Pediatric Nursing, three faculty members from the department of Psychiatry Nursing, one pediatrics specialist, and one child development specialist, were taken. The experts were shown the original and draft forms of the scale and they were asked to score the items between 1 (not relevant) and 4 (highly relevant). The consistency between expert opinions was evaluated. The Lawshe content validity index (CVI) was used for the item-level and the scale-level CVI of NCQ.[19] The experts found the Turkish and English forms appropriate. The language experts evaluated the final form of the scale.

Pretesting
The last step of the adaptation was pilot study.[16] In such studies, it is enough to collect data from 10-15 people for the pre-application.[16,20] Upon expert opinion, a pilot study was conducted on 20 children aged between 5-16 years in order to check the children's comprehension of scale items. Each child filled the questionnaire and was asked to express what the children understood was meant by each item. The children in the pilot study stated that the scale was easy and understandable. Thus, no changes have been made in the Turkish version of the scale, and the researchers decided to apply the questionnaire to the study sample.

Data evaluation
Frequencies and percentages, arithmetic means, and medians were used for the descriptive statistics. We used the IBM SPSS Version 22.0 (Armonk, NY, USA) package program and AMOS Graphics to test internal consistency and content and construct validity. Content validity was evaluated by CVR and CVI. Validity analyzes were performed with the exploratory factor analysis (EFA). The suitability of the sample size to start the analysis was decided by Bartlett's Test of Sphericity and Keiser-Mayer-Olkin (KMO). Varimax rotation was used in EFA. The Cronbach's alpha coefficient was used for internal consistency. The statistical significance of the results was determined in a 95% confidence interval, and $p < 0.05$ was accepted as statistically significant.

Results
Demographic variables
Most of the children were between the ages of 8-10 (44.5%) years and girls (57.5%). In addition, most of them hospitalized for 1-2 days (61.2%) and in medical clinics (72.5%). The mean age of the children was 10.03±1.98 (median=10) (Table 1).

Table 1. Demographic characteristics of children

Demographic variables	Mean±SD	Median
Age	10.03±1.98	10
	n	%
Age		
5–7 years	35	21.8
8–10 years	71	44.5
11–16 years	54	33.7
Gender		
Girl	92	57.5
Boy	68	42.5
Length of stay		
1–2 days	98	61.2
3–4 days	38	23.7
5–7 days	24	15.1
>7 days	0	0
Hospitalized clinical unit		
Medical	116	72.5
Surgical	44	27.5

Content validity

Nine experts were consulted for the content validity of the NCQ. Considering the number of experts as nine, the minimum CVR should be 0.78.[19] By taking the average of total CVRs for all items, the CVI was calculated as 0.78. Considering CVI=∑CVR/Number of Items and as provided CVI=CVR, the content validity of the scale was statistically significant (Table 2).

Table 2. Content validity results

| Items	Content validity ratios	Content validity index
To know I am safe and well looked after	100%	78%
To not see other children sad or upset	100%	
To feel the staff care about me	100%	
To have mum, dad or my family help care for me	100%	
That staff talk to me about the medicines I am having	100%	
That staff tell me my test results	100%	
To talk about how my illness may affect me	78%	
To have staff show me how the machines work	100%	
To get back to school	100%	
To have books to read	100%	
To have special treats after a test (presents)	100%	
To be able to do arts and crafts	100%	
To be able to go to the playroom	78%	
That I choose when I have visitors (family and/or friends)	100%	
To have the same nurse or doctor care for me	78%	
That staff listen to me	100%	
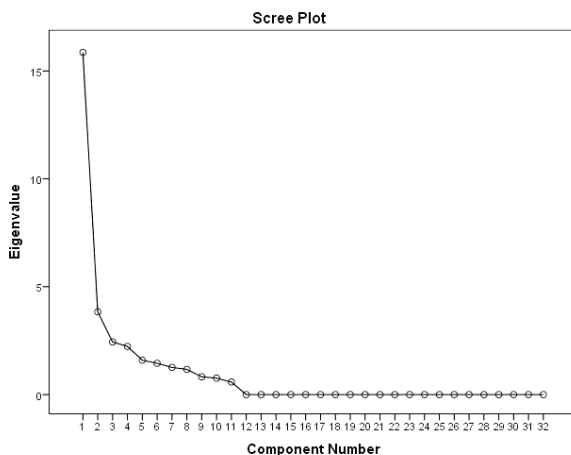
Fig. 1. Slope of scree plot

Construct validity

The Kaiser Meyer-Olkin (KMO) coefficient was found as 0.774 (Table 3). High values of KMO (more than 0.7) generally indicate that a factor analysis may be useful with the data.[21] A factor analysis was performed as the KMO value was higher than 0.70 (acceptable value).[21]

According to the explanatory factor analysis (EFA), the NCQ was found to have four factors with an eigenvalue above 1 (Table 3, Figure 1). The eigenvalue of the first factor was 15.85 and the variance it explained was 49.55; the eigenvalue of the second factor was 3.83, the variance it explained was 11.98; the eigenvalue of the third factor was 2.43 and the variance it explained was 7.62; and the eigenvalue of the fourth factor was 2.23 and the variance it explained was 6.97. The total variance explained was 76.13. It is sufficient for total vari-

Tablo 3. Exploratory factor analysis: pattern matrix

Items	Factors				Kaiser-Meyer-Olkin Measure
	Caring	Information	Activities	Relationships	
To know I am safe and well looked after	0.76				0.77
To not see other children sad or upset	0.77				
To feel the staff care about me	0.73				
To have mum, dad or my family help care for me	0.66				
That staff talk to me about the medicines I am having		0.78			
That staff tell me my test results		0.72			
To talk about how my illness may affect me		0.77			
To have staff show me how the machines work		0.77		0.56	
To get back to school		0.61			
To have books to read			0.4		
To have special treats after a test (presents)			0.67		
To be able to do arts and crafts			0.65		
To be able to go to the playroom			0.66		
That I choose when I have visitors (family and/or friends)				0.57	
To have the same nurse or doctor care for me				0.62	
That staff listen to me				0.55	
Eigenvalue	15.85	3.83	2.43	2.23	
Explained variance	49.55	11.98	7.62	6.97	
Total variance explained	49.55	61.53	69.15	76.13	

Table 4. Item-total score correlations and internal consistency results

Items	Factors			
	Caring	Information	Activities	Relationships
To know I am safe and well looked after	0.60			
To not see other children sad or upset	0.54			
To feel the staff care about me	0.50			
To have mum, dad or my family help care for me	0.51			
That staff talk to me about the medicines I am having		0.62		
That staff tell me my test results		0.58		
To talk about how my illness may affect me		0.59		
To have staff show me how the machines work		0.65		
To get back to school		0.53		
To have books to read			0.57	
To have special treats after a test (presents)			0.62	
To be able to do arts and crafts			0.64	
To be able to go to the playroom			0.72	
That I choose when I have visitors (family and/or friends)				0.6
To have the same nurse or doctor care for me				0.74
That staff listen to me				0.62
Cronbach's alpha (factors)	0.74	0.79	0.82	0.8
Cronbach's alpha (total)		0.89		

ance explained in multifactorial structures to vary between 40% and 60%. Table 2 shows the factor loadings of scale items according to EFA.

Reliability

The NCQ had high internal consistency (the Cronbach's alpha coefficients were 0.74, 0.79, 0.82, and 0.80 for the subscales of Caring, Information, Activities, and Relationships, respectively; and 0.893 for the total scale). Item-total score correlations of the NCQ varied between 0.53 and 0.82 (Table 4). Inter-item correlations of the NCQ were ranged from 0.15-0.70 (p<0.05) (Table 5).

Discussion

This study aimed to cross-culturally adapt NCQ and assess the Turkish validity and reliability of NCQ, which was developed to determine the needs of hospitalized children. NCQ had four-factor structure consisting of two categories and explained 76% of the total variance. NCQ showed high internal consistency (the Cronbach's alpha coefficients were 0.74, 0.79, 0.82, and 0.80 for the subscales of Caring, Information, Activities, and Relationships, respectively; and 0.89 for the total scale). Item-total score correlations of the NCQ varied between 0.53 and 0.82. Inter-item correlations of the NCQ were ranged from 0.15-0.70. Inter-item correlations values to be acceptable, must be greater than 0.30 and less than 0.80. Inter-item correlation values between 0.15 to 0.50 depicts a good result. lower than 0.15 means items are not correlated well.[22]

The construct validity of the NCQ was assessed in this study, performing EFA. Performing EFA is essential for testing construct validity in scale adaptation and development studies.[23] As a result of EFA, the NCQ was found to have a four-factor structure, explaining 76% of the total variance.

In this study, the item total score correlations of the NCQ ranged from 0.53 to 0.82. Item-total score

correlation gives information about whether the item measures the quality measured by the remaining items of the scale. The lower the total score correlation value of the item, the lower its share in the scale.[24] Item-total score correlation coefficient should have a positive value and be greater than +0.20. Items that do not fulfill this condition should be removed from the scale and the remaining items and the reliability of the scale should be checked again.[25] Foster et al. found the item-total score correlations of the NCQ between 0.50 and 0.77.[15] In this study, the item-total score correlations of the NCQ were found to be higher than those determined by Foster et al.[15]

Cronbach's alpha coefficient was used to determine the internal consistency of the NCQ. In this study, the Cronbach's alpha coefficients were found to be 0.74, 0.79, 0.82, and 0.80 for the subscales of Caring, Information, Activities, and Relationships, respectively; and 0.89 for the total scale. These values suggest that the NCQ has high reliability.[26] The higher the Cronbach's alpha coefficient, the more compatible the items in the scale and the more they collaborate to measure the same feature.[27] Foster et al. reported the Cronbach's alpha coefficients as 0.41, 0.47, 0.74, and 0.47 for the subscales of caring, information, activities, and relationships, respectively; and 0.69 for the total scale.[15]

Parallel forms reliability, one of the methods used for scale reliability, can be used when an alternative or equivalent form of the tested scale is available or created.[24] In this study, no scale was used as a parallel form to the NCQ. In Turkey, there is no scale to determine the psychosocial, physical and emotional needs of children based on their self-reports. Foster et al. also used no parallel form in the original study of the scale.[15]

In this study, most of the children had a short hospital stay (1-2 days). Most of the self-report measures in children were performed using children with chronic diseases.[28,29] Therefore, a time interval is needed for

Table 5. Inter-item correlation matrix[a]

	ACT1	ACT2	ACT3	ACT4	INF1	INF2	INF3	INF4	INF5	REL1	REL2	REL3	CAR1	CAR2	CAR3	CAR4
ACT1	1															
ACT2	0.53**	1														
ACT3	0.41**	0.51**	1													
ACT4	0.48**	0.55**	0.51**	1												
INF1	0.46**	0.56**	0.5**	0.7**	1											
INF2	0.26**	0.23**	0.24**	0.36**	0.49**	1										
INF3	0.24**	0.3**	0.15*	0.36**	0.35**	0.59**	1									
INF4	0.29**	0.34**	0.22**	0.32**	0.46**	0.27**	0.40**	1								
INF5	0.68**	0.62**	0.4**	0.49**	0.53**	0.32**	0.32**	0.31**	1							
REL1	0.4**	0.52**	0.37**	0.55**	0.59**	0.43**	0.46**	0.45**	0.53**	1						
REL2	0.56**	0.63**	0.31**	0.5**	0.53**	0.36**	0.34**	0.42**	0.65**	0.53**	1					
REL3	0.53**	0.53**	0.41**	0.48**	0.46**	0.26**	0.24**	0.29**	0.68**	0.4**	0.56**	1				
CAR1	0.53**	0.54**	0.51**	0.55**	0.56**	0.23**	0.3**	0.34**	0.62**	0.52**	0.63**	0.53**	1			
CAR2	0.41**	0.51**	0.50**	0.51**	0.5**	0.24**	0.15*	0.22**	0.4**	0.37**	0.31**	0.41**	0.51**	1		
CAR3	0.48**	0.55**	0.51**	0.5**	0.7**	0.36**	0.36**	0.32**	0.49**	0.55**	0.5**	0.48**	0.55**	0.51**	1	
CAR4	0.46**	0.56**	0.50**	0.70**	0.51**	0.49**	0.35**	0.46**	0.53**	0.59**	0.53**	0.46**	0.56**	0.50**	0.70**	1

[a] ACT – activities; CAR – caring; INF – information; REL – relationships; RES – resources; * p<0.05, ** p<0.01

test-retest applications. In the retests performed in a brief time, participants can remember their previous answers, thus affecting the reliability of the scale negatively. A reliability study needs a time interval ranging from 1 to 24 weeks.[30,31] In this study, children had short-term hospitalizations due to acute illnesses. It would therefore be unethical to assess the test-retest reliability of the scale. For this reason, the test-retest reliability was not tested in the original study of the scale.[15]

Physical, physiological, behavioral and psychological differences of children, their continuing growth and development, and their need for adults to meet their basic needs even when they are healthy increase the importance of healthcare provided by pediatric health professionals in determining and meeting children's needs when they are hospitalized.[1,2] Pediatric health professionals can learn the needs of their patients in the most accurate way from their own statements. Health professionals who know the needs of their patients can fully apply their care. Therefore, it is recommended that the scale be used by pediatric health professionals to evaluate the psychosocial, physical and emotional needs of hospitalized children in Turkey.

Conclusion

The NCQ, which was developed to determine the psychosocial, physical and emotional needs of school-age children based on their self-reports, has a high level of validity and reliability in Turkey. Therefore, it is recommended that the scale be used to evaluate the psychosocial, physical and emotional needs of hospitalized children in Turkish society. Its validity and reliability are recommended to be assessed in children with chronic diseases by using a larger sample.

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Declarations

Author contributions
Conceptualization, A.K., and F.D.; Methodology, A.K. and F.D.; Software, A.K. and F.D.; Validation, A.K. and F.D.; Formal Analysis, A.K. and F.D.; Investigation, A.K. and F.D.; Resources, A.K. and F.D.; Data Curation, A.K. and F.D.; Writing – Original Draft Preparation, A.K. and F.D.; Writing – Review & Editing, A.K. and F.D.; Visualization, A.K. and F.D.; Supervision, A.K. and F.D.; Project Administration, A.K. and F.D.; Funding Acquisition, A.K. and F.D.

Conflicts of interest
The authors declare that there is no conflict of interest.

Data availability
Data available on request from the authors.

Ethics approval
An ethical approval was obtained from an ethics committee of a university (IRB number: 2021-SBB-0249, Decision no: 9, Date: 31.05.2021).

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