Research article

The validity and reliability study of Turkish version of the fathers' support scale: Neonatal intensive care unit

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ABSTRACT

Background: Fathers whose infants are cared for in the neonatal intensive care unit have negative experiences and thus require support.
Aim: This study was carried out with the aim of performing a validity and reliability study of the Turkish version of the "Father's Support Scale: Neonatal Intensive Care Unit" (FSS: NICU).
Method: The study included 165 fathers whose infants were hospitalised in the neonatal intensive care units of a university hospital and a state hospital in the west of Turkey.
Findings: The item-total score correlation values of the scale were between 0.26 and 0.73 and the Cronbach's alpha coefficient was 0.91. It was found out that the test-retest reliability coefficients were between 0.78 and 0.92. The scale accounted for 48.38% of the total variance in three factors, as in the original version of the scale.
Conclusion: It was found that the Turkish version of the FSS: NICU was a valid and reliable measurement tool.

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Implications for clinical practice

- The fathers need support as much as the mothers when their infants are hospitalised in the neonatal intensive care unit.
- A Turkish adaptation of the Father's Support Scale revealed that Neonatal Intensive Care Unit accounted for 48.38% of the total variance in 3 factors, as observed in the original version of the scale.
- The FSS: NICU will contribute to determine the support needs of the fathers whose infants are in the neonatal intensive care unit.

Introduction

Admission of infants to the neonatal intensive care unit is a stressful situation for parents. There are many studies in the literature investigating the feelings of mothers and fathers whose infants are cared for in the neonatal intensive care unit (NICU) and the mechanisms used to cope with this stressful process (Carter et al., 2005; Turan et al., 2008; Miles et al., 1992; Smith et al., 2012; Hughes et al., 1994; Fowlie and Mchaffie, 2004).

Parents whose infants are cared for in the neonatal intensive care unit (NICU) experience many emotional reactions, such as frustration, guilt, unhappiness, depression, hostility, resentment, fear, anxiety, stress, disappointment, hopelessness, despair and loss of self-esteem (Affleck and Tennen, 1991; Miles at al, 1992; Kussano and Maehara, 1998; Lau and Morse, 2001; Carter et al., 2005; Chourasia et al., 2013; Turan et al., 2008; Heinemann et al., 2013; Eriksson and Pehrsson, 2002).

Parents' presence and co-operation in the NICU, family-centered care, is the best way to optimise the baby's physiological, neurobiological and emotional output. The determination of nursing initiatives according to the support needs of parents is important to the development of parental baby commitment and to the development of positive parental skills. After being discharged from the NICU, increased parental stress has adverse effects on parenting (Coughlin, 2014; McGrath, 2014). In determining the needs of parents, the father should not be ignored. Although many fathers whose infants are in the neonatal intensive care unit often emphasise that they feel weak and helpless, most healthcare

specialists focus on infants and mothers (Provenzi et al., 2015; Ireland et al., 2016; Walmsley 2016; Martel et al., 2016). The reasons that fathers often experience negative feelings can include concerns about the financial burden, appearance of the infant, change of parental role and housework (Dutta et al., 2016; Lee et al., 2005). Fathers have difficulty visiting their infants for many reasons: and if fathers having difficulty visiting their infants are not approached supportively, this may cause them to visit less often (Turan et al., 2008; Mahon et al., 2015). In the study performed by O'Brien and Warren (2014), fathers reported that the emotional support provided by nurses was inadequate. Lee et al. (2013) discovered that information and emotional support provided to fathers increased their paternal abilities, reduced stress and caused fathers to perceive nursing support positively. During this period, it is important for family members and friends to provide support to the fathers in addition to the nurses' support (Wigert et al., 2008).

In qualitative studies, it was has been found that the support and care provided at the bedside of their babies make fathers feel better (Garten et al., 2003; Lindberg et al., 2008).

It is crucial for the staff of the newborn intensive care unit to support fathers during the experience and the difficult periods. The NICU staff should have effective communication and collaboration skills to meet the needs of the baby and the family (Coughlin, 2014). The nurses must understand that the stress experienced and the coping mechanisms used by mothers and fathers are different from each other. The nurses should determine the fathers' support needs and plan nursing interventions to provide adequate support (D'Souza et al. 2009). It has been reported that when fathers get consistent and adequate information, they become more knowledgeable and feel more secure. This has the potential to lead to an increased likelihood of the fathers being involved in the long-term care of their infants (Walmsley, 2016).

Surveys found in literature put emphasis on the support needs of fathers whose babies stay in the newborn intensive care unit. The parenteral stressor scale was used in most of these studies, and both developmental and adaptation studies were performed on the mother (Özdemir and Alemdar, 2017). It was pointed out in the same surveys that there is no valid and reliable tool to systematically evaluate the needs of the fathers. Mahon et al. (2015) developed the father's support scale: neonatal intensive care unit (FSS: NICU) to determine paternal support needs in the NICU. In Turkey, the FSS: NICU has not been adapted into Turkish. Therefore, the purpose of this study was to identify the validity and reliability of the father's support scale: neonatal intensive care unit' that is used to evaluate the support needs of fathers whose babies stay in the newborn intensive care unit.

Method

Design

This study was conducted methodologically to perform a study of the validity and reliability of the Turkish version of the father's support scale: neonatal intensive care unit.

Place and sample of the study

The population of the study consisted of fathers whose infants were hospitalised in the neonatal intensive care units of a university hospital and a state hospital in western Turkey. The fathers of 165 infants met the criteria. For an adequate sample at least five times the total number of items on the FSS:NICU are required as participants for which the validity-reliability study would be performed (Nunnally, 1978). Fathers were contacted when their infants were hospitalised, and fathers whose infants stayed in the neonatal intensive care unit for more than a week were interviewed. The data were collected using a face-to-face interview technique in a room close to the neonatal intensive care unit.

Data collection tools

The data of the study were collected using the descriptive information form which includes questions defining the characteristics of the fathers and babies.

Father's support scale: neonatal intensive care unit

The father's support scale: neonatal intensive care unit (FSS: NICU) was developed by Mahon et al. (2015). The Cronbach's alpha value of the scale was 0.82. The Pearson's correlation coefficient was 0.81 using the test-retest (n = 72). The scale consists of three sections. Section I-Learning about your baby includes 10 questions for fathers to receive information about their infants. Section II-Taking care of yourself and your family includes 13 questions about the care of the fathers themselves and their families and Section III-Taking care of your baby includes 10 questions about the fathers' thoughts relating to the care of their infants. Possible answers for the father's support scale: neonatal intensive care unit (FSS: NICU) are as follows: not important (0), somewhat important (1), moderately important (2), very important (3), extremely important (4) and not applicable to me (N/A).

Language equivalence

Permission was obtained from the authors who developed the original scale to adapt the scale from English to Turkish and then to Turkish society. The scale was translated from English into Turkish by three expert translators. The back-translation of the Turkish form was done by an expert translator who speaks both languages. The scale items were created by the researchers by comparing the expressions in Turkish and English together with the expert translator who did the back-translation. The Turkish form that was created was submitted to a committee consisting of five experts (three nursing lecturers, one neonatology professor and one nurse in charge of a newborn intensive care unit) for consideration. The scores given by the experts to the scale items ranged from 1 to 4. The average acceptable score for each item was determined to be 3 and above based on the experts' opinions. After feedback from the experts on the intelligibility of the scale items was received, it was concluded that there was no average score below 3, and the scale was finalised in line with the suggestions.

Before starting the research, the scale was preliminarily applied to 10 fathers who met the inclusion criteria, but were not included in the sampling group. As a result, unclear expressions in the questions were clarified.

Study ethics

Ethical approval from the Ethics Committee of the university and permissions from the hospitals in which the study would be performed were obtained to perform the study. Fathers who participated in the study were informed about the purpose of the study, and their written consents were obtained. The necessary permission was obtained from the authors who developed the original FSS: NICU 60116787-020/72995.

Data analysis

Statistical analyses were performed using the SPSS software version 20.0. Descriptive characteristics were evaluated by number and percentage in the analysis of the data. For the reliability study, the Pearson product-moment correlation was used to analyse the item-total score scale when determining the internal consistency of the scale, the Cronbach's alpha coefficient was used to evaluate the internal consistency of the scale and the Pearson product-moment correlation analysis was performed when determining the test-retest reliability. For the validity study, the structural validity was assessed through the analysis of the key components, the Kaiser-Meyer-Olkin (KMO) test and the Barlett's test when determining the content validity.

Results

Sample characteristics

The mean age of the fathers who participated in the study was 32.00 years (SD = 5.7). 55% of their father graduated from high school, 93.9% were working, 99.4% had social security. 57.3% had balanced income and expenses. With respect to the infants of the fathers, 78.7% of the infants were born as a result of a desired and planned pregnancy. Ninety of the infants were male (54.5%), and 75 were female (45.5%); 30.3% were mature and 69.7% of the infants were premature. The mean birth week of the infants was 34.26 weeks (SD = 4.49), and the mean birth weight was 2.307 gm (SD = 875 gm). The infants included in the study were admitted to the neonatal intensive care unit mainly due to prematurity with respiratory disorders (35.8%) (Table 1).

Psychometric properties of the FSS:NICU

Item analysis

Total item correlations were examined to assess the internal consistency reliability of the scale. It is recommended that items with a correlation coefficient lower than .20 be removed (Özdamar, 1999). Total item correlation of all items of the FSS: NICU were between 0.26 and 0.73 (Table 2).

Internal consistency

The internal consistency of the FSS: NICU was evaluated with Cronbach's α coefficients and was found to be high (>.70). The scale items were homogeneous after the Cronbach's α reliability coefficient, which was 0.91 for the full scale (Table 2).

Test-retest

The data were collected again two weeks after the first application from a total of 25 fathers. To examine the correlation between the data collected at time points 1 and 2, the Pearson product-moment correlation was used. There was no significant difference between the total score averages of the FSS:NICU implemented at the two different time points (p < 0.05). The overall mean score of the scale was 3.15 ± 0.55 when applied for the first time and 3.55 ± 0.56 when applied for the second time (p > 0.05).

Structure validity

Factor structure validity was used to examine the validity of the scale. For the exploratory factor analysis, the Kaiser-Meyer-Olkin (KMO) value and the Barlett's test results were examined before the analysis, and the significance level of the KMO value was found as 0.83 and for the Barlett's test as p < 0.001. The Kaiser-Meyer-Olkin coefficient of the FSS: NICU of 0.83 is considered a very good

Table 1
Characteristics of Fathers and Infants.

	Mean	SD
The mean age of the fathers	32.00	5.7
The mean birth week of the infants	34.26	4.49
The mean birth weight of the infants	2.307	875

	n	%
Education of Fathers		
Primary school	25	15.2
Middle school	39	23.6
High school	55	33.3
University	46	27.9
Father occupation		
Emloyment	155	93.9
Non employment	10	6.1
Social security		
Yes	164	99.4
No	1	0.6
Economic status		
Low income	47	28.7
Balanced to income	94	57.3
High income	24	14.1
Being a planned baby		
Yes	129	78.7
No	36	21.3
Infants gender		
Female	75	45.5
Male	90	54.5
Gestational age		
Extremely Premature (<28 wks.)	31	18.8
Premature (28–36 wks.)	84	50.9
Full-Term (37–42 wks.)	50	30.3
Newborn's disease		
Prematurity With Respiratory Disorders	59	35.8
Respiratory With Hemotylitic, Infectious, and/or Metabolic Disorder	45	27.3
Gastrointestinal and/or Nephrolytic Disorders	17	10.3
Congenital, Neurological Disorders With Complications	25	15.2
Cardiovascular Disorders	19	11.5

value (Akgul, 1997). Based on this result, it can be said that the scale is suitable for factor analysis.

Basic components analysis with varimax rotation which is the most sensitive distinction between factors and the most commonly used, was done to analyse the key components (Ho, 2006). The results of the analysis indicated that the scale had seven initial factors without limitation. When the contribution of the factors to the variance was examined, it was determined that the first three factors contribute significantly to the variance, and that this contribution decreases from the fourth factor. Initial eigenvalues indicated that the first three factors explained 28.52%, 13.34% and 6.52% of the variance, respectively. The fourth, fifth, sixth and seventh factors had eigenvalues just over one, and each explained 3–4% of the variance. Solutions for four, five, six and seven factors were each examined using varimax rotations of the factor-loading matrix. The three factor solution, which explained 48.38% of the variance, was preferred because of the "leveling off" of eigenvalues on the scree plot after three factors and the insufficient number of primary loadings. The relationship of items with factors is explained by factor load value and that items in each factor group should be loaded with a factor of at least 0.30 (Stevens, 1996; Hair et al., 1998). Factor loads of all the items were found above 0.30. No item was removed from the scale since the factor loading of all items were between 0.32 and 0.83 (Table 3).

Taking care of yourself and your family-Section II items 11,14,15,16 were in the different factor. These items' correlation were checked again with their originial section and a significant

Table 2
Item analysis and internal consistency of father's support scale: neonatal intensive care unit.

Item	Corrected item total correlation	Cronbach's alpha if item deleted
Section I-Learning about your baby		
1. Getting regular information about your baby's health	0.29	0.90
2. Getting information about your baby in plain, non-medical language	0.37	0.90
3. Being able to get the information you need about your baby from the NICU doctors	0.43	0.90
4. Being able to understand what you hear about your baby on rounds	0.33	0.90
5. Getting recommendations for your baby's care from one doctor after medical meetings about your baby	0.46	0.89
6. Getting the information you need about your baby from the NICU nurses	0.44	0.90
7. Knowing the roles of staff who care for your baby	0.54	0.89
8. Getting a general idea (rather than a detailed report) about your baby's health daily	0.43	0.89
9. Feeling you are kept as well informed as the baby's mother	0.50	0.89
10. Being able to get information about your baby by phone	0.50	0.89
Section II-Taking care of yourself and your family		
11. Being able to talk with your partner often	0.53	0.89
12. Being able to talk with friends about your baby often	0.61	0.89
13. Being able to go to work	0.26	0.90
14. Being able to take time off work to be with your baby	0.29	0.90
15. Being able to take care of your finances	0.30	0.90
16. Being able to help with the care of your other children	0.31	0.90
17. Being able to talk with other NICU parents	0.55	0.89
18. Being able to talk with your extended family about your baby	0.73	0.89
19. Being able to get away to have some time on your own	0.47	0.89
20. Being able to exercise	0.53	0.89
21. Being able to pray or do other spiritual practices	0.47	0.89
22. Getting away to have some time with your partner	0.69	0.89
23. Being able to talk to an expert about your emotions or feelings	0,56	0.89
Section III-Taking care of your baby		
24. Being able to touch and hold your baby	0.52	0.89
25. Being able to comfort your baby if he/she is in pain or looks upset	0.34	0.90
26. Being able to do routine care for your baby such as feeding and diaper changing	0.51	0.89
27. Being a part of important decisions about your baby's care	0.51	0.89
28. Having different doctors' opinions about the best way to treat your baby	0.46	0.89
29. Getting a medical opinion about your baby's care from one doctor after a group discussion	0.52	0.89
30. Being able to talk to parents who had a baby in the NICU in the past	0.56	0.89
31. Understanding possible long-term problems your baby might have	0.40	0.90
32. Being able to stay and sleep overnight in the NICU when your baby is sick (even if you live close to the hospital)	0.58	0.89
33. Being able to have your baby take part in research studies	0.32	0.90
Total Cronbach's alpha	**0.91**	

correlation was found (for item 11 r = 0.47; for item 14 r = 0.41; for item 15 r = 0.23; for item r = 0.31). Thus these four items were taken back to their own section. In the same manner Items 31 and 33, which were in Section III-Taking care of your baby, were located under a different factor. These items' correlation was checked again with their original section, and a significant correlation was found (for item 31 r = 0.48 and for item 33 r = 0.56). These items were taken back into the Section III-Taking care of your baby.

As a result, it was found that factor one with an eigenvalue of 9.41 accounted for 28.52% of the total variance, factor two with an eigenvalue of 4.40 accounted for 13.34% of the total variance, and factor three with an eigenvalue of 2.15 accounted for 6.52% of the total variance; the structure of the three factors accounted for 48.38% of the total variance (Table 3).

Discussion

The FSS: NICU was developed to determine the support needs of fathers whose infants are in the neonatal intensive care unit (Mahon et al., 2015). There is no measuring tool available in Turkey to determine the support levels of fathers whose infants are in a neonatal intensive care unit. Reliable and valid scales are needed in this regard.

The item to total correlations as internal consistency reliability analysis was examined, and the correlations coefficients for all the items of the FSS:NICU were found to be between 0.26 and 0.73. In cases where the correlation coefficient falls below 0.20, it has been

removing the item from the scale has been suggested (Özdamar, 1999). Total item correlation of all items FSS:NICU is between 0.26 and 0.73. All items in the scales were within acceptable limits and had significant correlations.

It has been stated that acceptable Cronbach's alpha coefficients should be between 0.70 and 0.95 (Tavakol and Dennick, 2011). The Cronbach's alpha internal consistency coefficient of this scale was 0.91 in this study. When the Cronbach's alpha values for the Turkish version were compared with those of the original FSS:NICU, the Cronbach's alpha values from this study for the FSS:NICU were higher than the original values (Mahon et al., 2015).

It was observed that responses given by fathers to the scale items at two different times were consistent according to the analyses performed in our study (Burns and Grove, 2003). The general correlation of the scale (r = 0.90) was found to be positive and highly significant (p < 0.05). In the study by Mahon et al. (2015), the test–retest results for the full scale score was 0.81.

Exploratory factor analysis was performed to evaluate the structure validity of the scale. The criteria used in the determination of the factor number were the contribution of factor to total variance, the contribution of the factor to explain the total variance is higher than 5%, and an "elbow" in the plot, or an abrupt transition from large to small eigenvalues in the screen test (Çokluk et al., 2014).

Basic components analysis with varimax rotation was done to analyse the key components. In factor analysis, rotation is recommended to provide independence, interpretation clarity

Table 3
Principal factors of father's support scale: neonatal intensive care unit.

Item	Factor Loads		
	Factor 1	Factor 2	Factor 3
Item 20	.83		
Item 12	.81		
Item 19	.81		
Item 14	.78		
Item 17	.75		
Item 18	.70		
Item 11	.70		
Item 23	.69		
Item 16	.68		
Item 15	.55		
Item 22	.51		
Item 21	.39		
Item 13	.35		
Item 5		.76	
Item 6		.73	
Item 2		.72	
Item 3		.69	
Item 9		.64	
Item 1		.55	
Item 4		.51	
Item 10		.51	
Item 7		.44	
Item 8		.43	
Item 24			.73
Item 25			.69
Item 33			.68
Item 27			.67
Item 28			.66
Item 31			.59
Item 29			.51
Item 32			.44
Item 26			.41
Item 30			.32
Eigenvalues	9.41	4.40	2.15
Percentage of variance explained	28.52	13.34	6.52

and meaningfulness when the factor is more than two factors. After rotation, the load of the item increases in one factor, while the load in the other factors decreases. Varimax rotation is used in multi-actor situations (Büyüköztürk, 2002a; Çokluk et al., 2014).

The relationship between the items and factors is explained by the load factor value. Although there is no definite limit on the smallest value that an item must reach to be included in any factor, the values 0.30 or 0.40 are generally recommended. It has been suggested that items in each factor group should be loaded with a factor of at least 0.30 (Erdoğan et al., 2014; Stevens, 1996). No item was excluded from the scale because items' had a factor load between 0.32 and 0.83.

Compared to the original scale, only six items were loaded onto a different factor. As a result, Section I-Learning about your baby was composed of 28.52% with variance factor l, Section II-Taking care of yourself and your family was composed of 13.34% with variance factor 2, and Section III-Taking care of your baby was composed of 6.52% with variance factor 3. The scale accounted for 48.38% of the total variance in three factors, as in the original version of the scale. The variance as explained in single factorial scales needs to be 30% or more. This same variance needs to be higher in multifactorial scales (Büyüköztürk 2002b). This result shows us that the scale is valid structurally and that the structure of the original FSS:NICU has not changed.

Limitations

The limitation of our study is that our sample may not reflect the global support needs of fathers whose babies are hospitalised in the neonatal intensive care unit. This methodological study was carried out only in newborn intensive care units of solely two hospitals in one region of Turkey with fathers whose infants stayed in the neonatal intensive care unit for more than a week. The results cannot be generalised.

Conclusion

It has been determined that in the study conducted to test the validity and reliability of the FSS: NICU in Turkey that the Turkish version of the FSS: NICU is a valid and reliable measurement tool. Based on these results, it is believed that the scale will help to determine the support needs of fathers whose infants are in the neonatal intensive care unit, so healthcare workers can implement the necessary interventions.

In Turkey, there is no valid and reliable scale to measure the support needs of the fathers whose babies stay in the newborn intensive care unit. The scale whose validity and reliability were determined in this study is the first in this field. It is recommended that new studies should be done in a greater number of newborn intensive care units and with different sample groups.

Conflict of interest

No conflict of interest all authors.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.iccn.2018.08.007.

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