

## Validity and Reliability Study of Perception of Insufficient Milk Supply Questionnaire for Turkish Society

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### HIGHLIGHTS

- > When Turkish health care professionals use Perception of Insufficient Milk Questionnaire; they can:
  - use this questionnaire to diagnose frequently encountered problem at an early period.
  - undertake the interventions aimed at the problems in order to positively affect the process of breast-feeding.
  - decrease the complications that may be caused by lack of sufficient nutrition.
  - measure perceptions of insufficient milk.

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### ABSTRACT

Perceived insufficient milk causes mothers to feel that they are a failure in nutrition and breast-feeding, and they stop breast-feeding earlier. Early detection of these perceptions is important. The objective of this study is to adapt the Perception of Insufficient Milk Supply Questionnaire into Turkish mothers and conduct the validity and reliability analyses of the scale. The study was set in the neonatal unit of a university hospital in an eastern province of Turkey between June 2013-February 2014. Two hundred mothers, whose babies were hospitalized in neonatal unit, participated. The study included mothers who had no problem with breast-feeding, actively breastfed their infants, and clinically had a sufficient amount of milk. It was determined that mostly age group of mothers were 19-35 (91.5%); 39.5% were primary school graduates; a great majority of them (79.0%) were unemployed. The linguistic equivalence of the scale was primarily examined, and then its validity and reliability analyses were performed after confirming the linguistic equivalence. We conducted the language validity of the Perception of Insufficient Milk Questionnaire, which was adapted into Turkish. The following values were determined regarding the Turkish version of the Perception of Insufficient Milk Questionnaire: Test-content validity index 0.87, item total correlation scores 0.70 and 0.87, retest correlation value 0.81, and a Cronbach  $\alpha$  coefficient of 0.82. According to these results, it could be asserted that Perception of Insufficient Milk Questionnaire is a valid and reliable assessment instrument for Turkish society.

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## 1. Introduction

Breast milk is a spectacular nutrient containing all the liquid, the nutritional and the energy elements that are required to protect and promote the health of newborns, provide a sufficient and balanced nutrition, maintain a healthy growth development, and protect and develop the immune system in newborns [1].

Morbidity and mortality rate significantly decrease in newborns nursed with breast milk throughout the first one year of life [2]. Organizations like the World Health Organization (WHO), the American Academy of Pediatrics (AAP), and the Canadian Pediatric Society (CPS) suggest breast-feeding throughout the first 6 months and supplementary foods along with the breast milk until the end of the age two [3, 4]. According to the data of the Turkish Demographic and Health Survey (TDHS) in 2013, in our country, the rate of infants who are breastfed for a certain period of time is 96% and the rate of infants who have only breast milk in the first 2 months of their life is 58% and this rate decreases to 10% when the baby is 4-5 months old [5].

Nutrition is a frequent problem among infants receiving treatment and care in a neonatal intensive care unit [6]. As well as the problems of being a new mother; factors like having a sick, premature or low-birth-weight infant; being physically and emotionally separated from the infant; the stressful environment of the unit; and long hospitalization cause a great stress for mothers and disable them from efficiently nursing their infants [7, 8]. Also the mother's stress level is affected negatively the secretion of breast milk and breast-feeding. Therefore, the mother's comfortable is important at the maximum level after birth [1].

One of the important reasons for mothers to stop breast-feeding earlier is their perceived insufficient milk regarding their babies [9]. Perceived insufficient milk causes mothers to feel that they are a failure in nutrition and breast-feeding, and they stop breast-feeding earlier [4]. A very small portion of mothers think that their milk is sufficient for their infants, whereas a great part of them believe that their milk is insufficient, and they consequently wean their babies earlier than required [10, 11]. Thus, the common problem in a considerable portion of women regarding breast-feeding and earlier weaning is their perceived insufficient milk [10].

While 24-hour tests and weight follow-up of the child could easily prove the sufficiency of breast milk, they fail to evaluate the perceived insufficient milk of mothers. However, a majority of mothers believe that their milk will not be suffi-

cient to breastfeed their babies although it indeed is sufficient, which is a consequence of the misperception of insufficient milk [12]. Therefore, nurses are required to diagnose this frequently encountered problem at an early period and undertake the interventions aimed at the problems in order to positively affect the process of breast-feeding and, consequently, decrease the complications that may be caused by lack of sufficient nutrition that could be received. Even though there are studies on perceived insufficient milk in a number of countries [11, 13], there are no reliable assessment measurements to measure this perception in Turkey. Therefore, this study was conducted in order to perform the Turkish validity and reliability assessment of the Perception of Insufficient Milk Supply Questionnaire.

## 2. Material and Method

### 2.1. Time and Place of the Study

This methodological, descriptive, and relation-seeking study was conducted in a university hospital located in the east of Turkey between June 2013 and February 2014.

### 2.2. Population and Sample Group of the Study

The population of the study was represented by mothers whose babies were hospitalized in the "Neonatal Clinic" of the aforementioned hospital. Determining the average data of the previous year as a reference (n=340), the sample size was determined as a result of a power analysis which consisted of a test power of 95%, an error margin of 0.05, an effect size of 0.8, and a population representation power of 86% (n=200).

#### 2.2.1. Inclusion Criteria of the Study

##### 2.2.1.1. Criteria of Infants

Infants were included in the study if they had no disease (congenital anomaly, prematurity, cleft palate, cleft lip, neurological disorders, etc.) that would affect breast-feeding, had a birth weight above 2500 g, a gestation age of more than 37 weeks, and were fed only with breast milk.

##### 2.2.1.2. Criteria of Mothers

The study included mothers, who were older than 18, had no obstacle for breast-feeding (neurological disorders, mastitis, drug use, psychological disorders, etc.) and no visual and aural problems, produced milk of at least 30 cc (those who could have a minimum of 30 cc of milk when extracted with the clinic's milk pump from the previous meal), and were open to both communication and cooperation.

### 2.3. Data Collection Tools

A “Personal Information Form” and a “Perception of Insufficient Milk Supply (PIM)” were used to collect the study data.

#### 2.3.1. Personal Information Form

For use in collecting the data, the “Personal Information Form” was prepared by the researcher in accordance with the literature [14–16]. Information on the mother, the pregnancy, the infant, and breastfeeding were collected. Further information was obtained such as the age, education, working status of the mother, income status of the family, planning process of pregnancy, number of children, and the delivery method. In addition, the gender of the infant, birth weight, gestation week, mother’s breastfeeding experience, received breastfeeding training, time to start breastfeeding, and the time the mother planned to feed her baby only with breast milk were in questions on this form.

#### 2.3.2. Perception of Insufficient Milk Supply (PIM)

Hill and Humenick (1989) described potential determinants and signs of insufficient milk supply, surrounding maternal and newborn factors and physiologic and psychologic factors [10]. McCarter-Spaulding and Kearney (2001) developed an instrument designed to measure perceptions of insufficient milk based on clinical experience and the literature as well as Hill and Humenick’s conceptual model and the questionnaire is a form involving 6 questions [13].

The first question is about whether the mother perceives her milk to be sufficient or not. The mother answers this question as “yes” or “no”. Other questions of the questionnaire aim to assess the perceived insufficient milk. The mother is required to score these questions between 0-10. While “0” signifies that the milk is perceived completely insufficient, “10” signifies that it is perceived completely sufficient. The lowest score to be obtained from the scale is 0, whereas the highest score is 50. The value of the total score signifies how high is the amount of the score and indicates whether there is perceived sufficient milk. The Cronbach  $\alpha$  value was determined as 0.81 in the original scale. In this study, on the other hand, the Cronbach  $\alpha$  value was determined to be as 0.82.

### 2.4. Data Collection

The data were collected by the researcher in infant rooms of the aforementioned hospital. During the interview, the “Personal Information Form” and the “Perception of Insufficient Milk Supply” were presented to the mothers and mothers filled out the form. Because PIM is the individual perception of the mother’s about hers milk, we want to fill the PIM by mothers to avoid bias.

### 2.5. Data Assessment

Statistical Package for Social Sciences for Windows (SPSS) 18.0 statistical package program was used to code the data and conduct statistical analysis. Percentage distribution and mean, Factor analysis, Pearson correlation test and Cronbach’s  $\alpha$  reliability coefficient analyses were used to assess the data.

### 2.6. Ethical Aspect of the Study

We obtained permission for the Turkish adaptation of the Perception of Insufficient Milk Supply (PIM) from McCarter-Spaulding and Kearney, who changed the scale, and we received approval from the Ethics Committee of the Atatürk University Faculty of Health Sciences in order to conduct the study. Before starting the study, we obtained written permission from the hospital where the study would be conducted. Once families of infants meeting the inclusion criteria of the study group were informed about the objective and duration of the study and the proceedings to be performed throughout the study, their written permission was received and in this way, the “Principle of Informed Consent” was fulfilled.

## 3. Results and Discussion

It was determined that 91.5% of mothers who participated in the study were in the age group of 19-35; 39.5% were primary school graduates; a great majority of them (79.0%) were unemployed; 42% had equal monthly income and expenses; 62.5% had vaginal delivery; 52% of infants were male; and the average gestational week was  $39.07 \pm 1.33$  (Table 1).

Table 1 Distribution of the descriptive characteristics of mothers and infants

Descriptive Characteristics	Number	%
<b>Age Group (Year)</b>		
19-35	183	91.5
36 and older	17	8.5
<b>Educational Status</b>		
Illiterate	68	34.0
Primary School	79	39.5
High School	32	16.0
University	21	10.5
<b>Working Condition</b>		
Employed	42	21.0
Unemployed	158	79.0
<b>Income Status</b>		
Less income than expense	76	38.0
Equal income and expense	84	42.0
More income than expense	40	20.0
<b>Gender of Infant</b>		
Female	96	48.0
Male	104	52.0
<b>Delivery Method</b>		
Vaginal	125	62.5
Caesarean Section	75	37.5
Gestation Age*	39.07±1.33	

\*The average value was given.

In the first phase of the validity and reliability study, the language validity studies of the scale were conducted. Within the scope of the translating-retranslating study of the scale, the English text of the Perception of Insufficient Milk Questionnaire was translated from English to Turkish by the researcher and three English linguists who could speak both languages very well. All the forms translated into Turkish were reexamined by the researcher and turned into a single form. We compared the original scale with the scale that was translated into English and reviewed the inconvenient statements. In order to prefer the translations that would ideally express each item and form the Turkish version of the scale, the acquired scale forms were presented to experts for their

opinions. Experts evaluated each statement in the scale as follows; "4, very convenient", "3, will be convenient if the sentence is corrected a little bit", "2, will be convenient if the sentence is corrected", and "1, inconvenient". As a result of the evaluation, the inconvenient statements were corrected according to the suggestions of experts. Then it was determined that the scale, which was retranslated from Turkish to English by a English linguist who could speak both languages very well, had no change of meaning in its statements. Finally, the Turkish language of the scale was controlled by a Turkish language expert from the Department of Turkish Language and Literature.

Table 2 Factor loads and item total correlations of the questionnaire

Perception of Insufficient Milk Questionnaire	Factor Load	Item-Total Correlations	Variance	Cronbach $\alpha$ Coefficient	$\bar{X} \pm SD$	t	p
Do you think you produce sufficient milk for your baby?	0.670	-0.737			1.23±0.43	5.292	0.000
My milk seems to be nutritious enough to feed my baby.	0.732	0.758			7.83±1.21	6.030	0.000
My baby generally seems full after being nursed.	0.867	0.878			7.70±1.24	9.592	0.000
My baby seems to enjoy being nursed.	0.654	0.721			7.90±1.18	4.865	0.000
My milk contains all the nutrients that are required for the development of my baby.	0.631	0.730			8.30±1.15	8.237	0.000
It seems that I have enough milk in my breasts.	0.713	0.705			8.50±1.28	4.696	0.000
Total			71.109%	0.82		13.451	0.000

Content/extent validity and construct validity are most preferred in evaluating the validity of a scale [17]. In the first phase of the application regarding the content validity of the scale, the Turkish form of the scale was presented to the views of ten experts including Associate Professors and Assistant Professors. The Content Validity Index-CVI was used to evaluate the expert opinions. The experts used the following expressions regarding the assessment degree of each item in the scale; 1= Inconvenient; 2= Convenient, but requires some little changes in statements; 3= Very convenient; 4= Completely convenient; and each item was required to be evaluated between 1-4 points [18].

As a result of the Kendall Coefficient of Concordance (W) calculation that was performed to assess the compatibility of scores given by experts, it was determined that the experts reached a consensus. The statements in the scale were convenient for our culture and represented the area to be assessed. As a result of the analyses that were performed to evaluate the expert opinions, the content validity index was found to be 0.87. The standard value is accepted as 0.80 for the content validity index. When the content validity index is higher than 0.67, it means that it is sufficient in terms of the content validity of the scale [17, 19]. According to these results, we provided the content validity of the Perception of Insufficient Milk Questionnaire. It was suggested to perform a preliminary application with a group of 10-15 individuals that preferably had different educational levels in scales that have a content validity and similar features with the sample group. Then, receive the opinions of individuals regarding the readability and comprehensibility of the scale [20]. Being organized in accordance with expert opinions, the Perception of Insufficient Milk Questionnaire was applied to 30 mothers, who had similar features with mothers included in the

The validity and reliability study of the Perception of Insufficient Milk Questionnaire was conducted in accordance with the principles in the relevant literature and the opinions of experts like nurses and linguists. As a result of the analysis performed to evaluate the opinions of experts, the content validity index was found to be 0.87.

For the Turkish version of the Perception of Insufficient Milk Questionnaire, the item total correlation scores were between 0.70 and 0.87, the Cronbach  $\alpha$  coefficient was 0.82 and the factor loads of the scale were between 0.631 and 0.867 (Table 2).

study but were somehow excluded in the pilot scheme from the study. According to the suggestions made by mothers, some little corrections were made to increase the comprehensibility of the scale, and the scale was finalized before the actual application.

Item total score correlations, the Cronbach  $\alpha$  evaluation, and factor analysis were used in controlling the internal consistency of the Turkish form of the Perception of Insufficient Milk Questionnaire. Item analysis signifies the relationship between the value obtained by each item in the assessment instrument, and the total value obtained from the overall assessment instrument. If items in the assessment instrument have equal weights and independent units, the relationship between each item value and total values is expected to be high.

There is no certain standard regarding under which criterion the item total score correlation coefficient will have an insufficient reliability and Karasar (1995) thinks that items with a coefficient lower than 0.50 should be questioned in terms of the reliability [21], whereas Öner (1994) thinks that this coefficient should be higher than 0.30 [22]. The item total correlation scores of the Turkish form of the Perception of Insufficient Milk Questionnaire were between 0.70 and 0.87 (Table 2). From this aspect, the item total correlation values of the Turkish form of the Perception of Insufficient Milk Scale had a convenient reliability level.

The Perception of Insufficient Milk Questionnaire was primarily tested in terms of its reliability after being applied to mothers that were included in the study and after computerizing the data. The Cronbach  $\alpha$  reliability coefficient was calculated as an indicator of the internal consistency and homogeneity of the Perception of Insufficient Milk Questionnaire.

In this study, the Cronbach  $\alpha$  coefficient of the Turkish form of the Perception of Insufficient Milk Scale was found to be 0.82 (Table 2), which shows that this scale is a highly reliable scale with internal consistency.

The sample sufficiency of the scale calculated by Kaiser-Meyer-Olkin (KMO) was 0.87. As a result of the Bartlett's Test,  $X^2=115.28$ , it was observed to be significant at the significance level of  $p<0.001$  (Table 3).

Table 3 Results of the KMO sample sufficiency test and BTS sample size examination analysis

Tests	Results	p
KMO	0.87	p<0.001
BTS	$\chi^2= 115.28$	

Before examining the factor structure of the Perception of Insufficient Milk Questionnaire, we applied analyses such as the Kaiser-Meyer-Olkin (KMO) in order to evaluate whether the sample group was sufficient for the factor analysis and the Bartlett's Test of Sphericity (BTS), in order to evaluate whether the sample group was suitable for the factor analysis or not. The sample sufficiency of the scale was calculated by KMO as 0.87. The literature emphasizes that a good KMO value should be 0.70 and above [23, 24]. This value shows that the sample size of the scale is very good. As a result of the Bartlett's Test,  $\chi^2=115.28$ , it was observed to be significant at the significance level of  $p<0.001$  (Table 3). This finding shows that the scale is convenient for the factor analysis.

The scale that was tested in terms of its reliability and was determined as reliable should also be tested in terms of its construct validity [25]. Construct validity indicates how accurately the abstract concept of the scale could be measured [26]. In order to determine the construct validity of the Perception of Insufficient Milk Scale, we performed the factor analysis and as a result of this analysis, the scale was determined to be a single-factor scale. In the literature, it is indicated one should leave items with a factor load below 0.30 out of assessment [27]. As a result of the analyses, it was observed that the factor loads of the Turkish form of the Perception of Insufficient Milk Questionnaire distributed between 0.631 and 0.867. Thus, none of the scale items were left out of assessment. It was determined that the factor structure, which was obtained from the factor analysis of the Perception of Insufficient Milk Questionnaire, had the construct validity.

In order to determine the reliability of the scale, a Test-Retest application was performed on 30 mothers with two-week interval and the Test-Retest correlation value was found to be 0.81. As a result of the Test-Retest, a highly positive and significant relationship was determined between the two applications (Table 4).

Table 4 Correlation analysis of test-retest scores

Perception of Insufficient Milk Questionnaire (Test-Retest Application)	X $\pm$ SD	r	p
First Application	41.467 $\pm$ 4.86	0.81	.000
Second Application	42.063 $\pm$ 4.39		

Time invariance is a feature of the assessment instrument to provide a similar assessment value in repeated measurements at different times [28]. The most popular method of calculating the reliability is the Test-Retest method. Test-Retest reliability is based on the reapplication of an assessment instrument to the same individuals under the same conditions, but with a certain time interval. This method tests the power of the assessment instrument to give consistent results from application to application and to show a time invariance [17, 19]. In order to determine the Test-Retest reliability of the scale, the correlation coefficient between the acquired scores is expected to be at least 0.70 [28]. In the study, the Test-Retest correlation value of the scale was found to be 0.81. As a result of the Test-Retest, a highly positive and significant relationship was observed between both applications (Table 4).

## Conclusions

We conducted the language validity of the Perception of Insufficient Milk Questionnaire, which was adapted into Turkish. The following values were determined regarding the Turkish version of the Perception of Insufficient Milk Questionnaire: Test-content validity index 0.87, item total correlation scores 0.70 and 0.87, retest correlation value 0.81, and a Cronbach  $\alpha$  coefficient of 0.82. According to these results, it could be asserted that Perception of Insufficient Milk Questionnaire is a valid and reliable assessment instrument for Turkish society.

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## Conflict of interest

The authors declare that they have no conflicting interests.

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