Original Article

The relationship between insufficient milk perception and breastfeeding self-efficacy among Turkish mothers

Emine Gökçeoğlu[1] and Sibel Küçükoğlu[2]

Abstract:
Objective: This study was conducted to investigate the relationship between perceived insufficient milk and breastfeeding self-efficacy levels among Turkish mothers.
Methods: The study was conducted on 200 mothers whose infants were hospitalized and under treatment and who could breastfeed their infants in the newborn clinic of a university hospital in eastern Turkey between June 2013 and February 2014. A sampling method was not applied in the study, so the sample consisted of the population of the study. The 'Personal Information Form', 'Breastfeeding Self-Efficacy Scale' and 'Perception of Insufficient Milk Questionnaire' were used to collect the data. Data were analysed by using percentage distribution and arithmetic average; independent sample t test, Mann–Whitney U test, Kruskal–Wallis variance analysis, Pearson correlation analysis and Cronbach alpha reliability coefficiency in the SPSS 18.0 package program.
Results: The study determined that advanced age, higher education level and higher income status, male gender of the child, planning of the pregnancy, many births, receiving breastfeeding education and the length of time that mothers planned to exclusively breastfeed affected breastfeeding self-efficacy and perception of milk sufficiency positively ($p<0.05$). The study showed that, as breastfeeding self-efficacy levels of mothers increased, their perception of milk sufficiency also increased ($p<0.05$).
Conclusion: The study concluded that some factors related to the mother, infant, pregnancy and breastfeeding affected breastfeeding self-efficacy and the perception of milk insufficiency. As the breastfeeding self-efficacy level increased, the milk was perceived to be more sufficient. (Global Health Promotion, 2017; 24(4): 53–61)

Keywords: breastfeeding, children, health care, nutrition

Introduction

Breast milk is a wonderful nourishment with a high bio-efficacy that is easily digestible, maintains its positive effects for a lifetime and contains all liquids, nutrients and energy elements required for protecting and promoting the health of the newborn; thus ensuring adequate and balanced nutrition, maintaining healthy growth development and preserving and developing the immune system (1).

Institutions such as the World Health Organization, the American Academy of Pediatrics recommend exclusive breastfeeding for the first 6 months with supplementary food in addition to breast milk until the end of age of 2 years (2,3). Altogether, 68.9% of 0–2 month-old infants, 42% of 2–3 month-old infants, 23.6% of 4–5 month-old infants and only 1.6% of 6–7 month-old infants are fed with breast milk in Turkey (1).

Nutrition is a common problem encountered among infants under treatment and care in newborn intensive care units (4). In addition to the challenges of being a new mother, factors such as having a sick,

1. Muş Alparslan Türkeş University, Turkey.
2. Faculty of Health Science - Atatürk University, Erzurum, Turkey.

Correspondence to: Sibel Küçükoğlu, Ataturk University Faculty of Health Sciences, Erzurum 25240, Turkey. Email: s_nadaroglu@hotmail.com

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premature or low birth weight infant, being separated physically and emotionally from the baby, the stressful environment of the intensive care unit and long-term hospitalization affect parents negatively. This creates a large source of stress, especially for the mother, and prevents maintaining breastfeeding with the desired efficiency (5,6).

The process of breastfeeding is a complex phenomenon and this process is affected by numerous demographic, social, psychological and physical variables. In addition to the above-mentioned reasons, another reason indicated by mothers who stop breastfeeding early is the belief that her breast milk is insufficient for feeding her infant (7). Perceived insufficient milk causes mothers to feel inadequate while breastfeeding their infants and stop breastfeeding in the early period (3). Only a small group of mothers believe their milk is sufficient for their infants, whereas the majority of mothers believe their milk is insufficient and wean their infants much earlier than they should (8).

The perception of self-efficacy plays an important role in determining breastfeeding duration. Perception of self-efficacy is the feeling of the mother of sufficiency related to breastfeeding. Studies indicate that the strongest factor, especially for determining breastfeeding results, is the self-efficacy perception of the mother (9,10). The conducted study determined that the breastfeeding self-efficacy level of the mother and perception of milk sufficiency are correlated and these two perceptions are affected by each other (11). Dennis also indicated that as the mother's perception of breastfeeding self-efficacy increased, she perceived her milk to be more sufficient (12).

Practices intended to increase breastfeeding self-efficacy are highly important and it is known that those practices encouraging breastfeeding increase the self-efficacy level. However, the number of studies analysing the relationship between breastfeeding self-efficacy level and perceived insufficient milk is very limited (7,13). Although there are a limited number of studies related to breastfeeding self-efficacy levels in Turkey (4,14), no studies analysing the relationship between breastfeeding self-efficacy and perceived insufficient milk were reported. Therefore, this study was conducted to analyse the relationship between breastfeeding self-efficacy and perceived insufficient milk of mothers whose infants were hospitalized in the newborn clinic.

Material and methods

Design of the study

The study was conducted as descriptive (we give the mothers' and babies' descriptive characteristics and analyses) and sought to elucidate the relationship between breastfeeding self-efficacy and perceived insufficient milk (we give the Pearson correlation analysis).

Place and time of the study

The study was conducted in the neonatal unit of a university hospital in an eastern province of Turkey between June 2013 and February 2014.

Population and sample group of the study

After having specified the average value by taking the data of the previous year's hospital records as reference (n=340), the sample size was determined as a result of a power analysis, which consists of test power of 95%, an error margin of 0.05, effect size of 0.8 and population representation power of 86% (n=200).

Inclusion criteria of the study

Infants

- Infants with no conditions that may affect breastfeeding (congenital anomaly, born before 34th gestation week, premature, cleft palate, cleft lip, neurological disorders, etc.).
- With a birth weight above 2500 g.
- With a gestation age older than 37 weeks.
- Fed only with breast milk.

Mothers

- Over the age of 18 years.
- With no conditions that may affect breastfeeding (neurological disorders, mastitis, use of medication, psychological disorders, etc.).
- With no visual or audial problems.
- With the ability of producing at least 30 cc of milk (those who produced a minimum of 30 cc of milk when extracted with the clinic's breast pump for the previous feeding).
- Who were open to communication and cooperation.

Data collection tools

The 'Personal Information Form', 'Breastfeeding Self-Efficacy Scale' and 'PIM Questionnaire' were used to collect data in this study.

Personal information form

This form was used to gather information on the mother, pregnancy, infant and breastfeeding. Specific questions collected data such as the age, education and working status of the mother. Other questions pertained to income status of the family, planning process of the pregnancy, number of children, delivery method, gender of the infant, birth weight, gestation week, mother's breastfeeding experience, whether she received breastfeeding training, time breastfeeding began and the length of time the mother planned to exclusively feed her baby breast milk.

Breastfeeding Self-Efficacy Scale

The first form of this scale was a 33-item scale developed by Dennis and Faux to evaluate breastfeeding self-efficacy levels of mothers (15). Afterward, a short 14-item form of the scale, developed and recommended by Dennis, was used. This form is easy to complete and evaluates self-efficacy accurately (2). The Breastfeeding Self-Efficacy Scale is a 5-point Likert-type scale (1= 'I am not sure at all' and 5 = 'I am always sure'). The scale's minimum score is 14 and the maximum score is 70. An elevated score shows an increase in breastfeeding self-efficacy.

Validity and reliability of the scale's Turkish version was conducted by Tokat *et al.* and the Cronbach α value was 0.86. The scale's Cronbach α value was found to be 0.91 in this study.

PIM Questionnaire

This scale, developed by McCarter-Spaulding for determining the perception of insufficient breast milk, is a six-question form (13). The first question asks if the mother perceives her milk as sufficient or not. Mothers answer this question with 'yes' or 'no'. Other questions of this scale intend to measure the milk insufficiency perception. Mothers are asked to score between 0 and 10 for these questions: '0' indicates that milk is perceived to be completely insufficient; '10' indicates that milk is perceived to be completely sufficient. The scale's minimum score is 0 and maximum score is 50. A high total score indicates that milk sufficiency perception is also high.

A validity and reliability study of the scale's Turkish version was conducted by Gökçeoğlu (16), and the original scale's Cronbach α value was 0.81; conversely, the scale's Cronbach α value was found to be 0.82 in this study.

Data collection

Data was collected by the researcher through face-to-face interviews with mothers in their hospital rooms. During the interviews the Personal Information Form, Breastfeeding Self-Efficacy Scale and PIM Questionnaire were given to the mothers. The data collection process took, on average, 20 minutes for each mother.

Data assessment

The IBM SPSS Statistics 20 program was used to code the data and conduct statistical analysis. Descriptive statistics as well as independent samples t-test, Mann–Whitney U-test, Kruskal–Wallis analysis, one-way analysis of variance, Pearson correlation analysis and Cronbach's alpha coefficient were used to assess the data.

Ethical aspect of the study

Approval to conduct the study was received from the Atatürk University Faculty of Health Sciences Ethics Committee. Before beginning the study, written permissions were received from the hospital where it would be conducted. Written consent was provided by signing the Principle of Informed Consent.

Results

When descriptive characteristics of mothers and pregnancy were evaluated within the scope of the study, it was specified that 91.5% of mothers were in the 19–35 age group, 39.5% were primary education graduates, a majority of them (79.0%) were unemployed and 42% of them had an income equal to their expenses. The study also determined

Table 1. Distribution of descriptive characteristics of mothers and pregnancy (N = 200).

Descriptive characteristics	*Number*	*%*	*Confidence interval of the percentages*
Age group (years)			1.0460-1.1240
19–35	183	91.5	
36 and above	17	8.5	
Educational status			1.8960–2.1640
Illiterate	68	34.0	
Primary education	79	39.5	
High school	32	16.0	
University	21	10.5	
Working condition			1.8001–1.8999
Employed	42	21.0	
Unemployed	158	79.0	
Income status			1.7166–1.9234
Income lower than expenses	76	38.0	
Income equal to expenses	84	42.0	
Income higher than expenses	40	20.0	
Planning of pregnancy			1.1941–1.3159
Planned	149	74.5	
Not planned	51	25.5	
Delivery method			1.3073–1.4427
Vaginal	125	62.5	
Cesarean	75	37.5	
Number of children			1.6148–1.7452
One child	64	32.0	
Two or more children	136	68.0	
Total	200	100.0	

that 74.5% of mothers planned their pregnancy and 62.5% had a vaginal delivery. The mothers' average number of children was 2.53±1.49 (Table 1).

When distribution of descriptive characteristics of mothers' infants participating in the study was examined, it was determined that 52% of infants were male, 74.5% of mothers had breastfeeding experience, 26% received breastfeeding training and a very small group of infants (14.5%) were breastfed right after birth. When mothers were asked how long they were planning to breastfeed their babies, they planned to breastfeed for an average period of 17.28±5.96 months and gestational age was 39.07±1.33, on average (Table 2).

The study found that the breastfeeding self-efficacy mean score of mothers was 45.91±9.00 and the mean score of perception of insufficient milk was 37.57±5.62.When the relationship between the mothers' breastfeeding self-efficacy levels and perception of insufficient milk was examined, a significant relationship was seen between the mothers' breastfeeding self-efficacy perceptions and their perception of insufficient milk (p<0.001; see Table S1 in supplementary material).

This study specified that mothers in the age group of 36 years and above and mothers who were university graduates had higher Breastfeeding Self-Efficacy Scale scores and PIM mean scores compared to mothers in other groups and the difference between groups was found to be statistically significant (p<0.05).

The breastfeeding self-efficacy mean score of mothers whose families had incomes higher than their expenses was 50.30±6.91 and their PIM mean score was 40.25±5.22 in the study. A significant difference was found between groups according to their income status in terms of mean scores of both scales (p<0.001; see Table S2 in supplementary material).

When examining genders of infants in the study, it was found that both Breastfeeding Self-Efficacy Scale mean scores (48.63±8.36) and PIM mean

Table 2. Distribution of descriptive characteristics of infants and breastfeeding.

Descriptive characteristics	*Number*	*%*	*Confidence interval of the percentages*
Infant's gender			1.4502–1.5898
Female	96	48.0	
Male	104	52.0	
Breastfeeding experience			1.2738–1.4062
Yes	132	66.0	
No	68	34.0	
Breastfeeding training			1.6787–1.8013
Received	52	26.0	
Did not receive	148	74.0	
Breastfeeding time of infant			2.5346–2.8154
Immediately after birth (within the first 30 minutes)	29	14.5	
31–60 minutes	57	28.5	
61 minutes and above	64	32.0	
After the first 24 hours	50	25.0	
Total	**200**	**100**	

scores (38.81±5.86) of mothers who had male infants were higher than those of mothers who had female infants and the difference between groups was statistically significant ($p<0.001$; see Table S2 in supplementary material).

A significant difference was found between groups in terms of their mean scores in both scales according to planning their pregnancy and number of children ($p<0.001$; see Table S3 in supplementary material).

It was determined in the study that previous breastfeeding experience, receiving breastfeeding training and the time of initial breastfeeding within the first 24 hours affected breastfeeding self-efficacy and perception of insufficient milk ($p<0.05$). Mothers who breastfed their infants immediately after birth (within the first 30 minutes) had higher breastfeeding self-efficacy (48.55±6.85) and perception of insufficient milk mean scores (39.21±5.10) (see Table S4 in supplementary material).

A positive and significant relationship was found between the time that mothers participating in the study planned to feed their infants with only breast milk and their breastfeeding self-efficacy and insufficient milk perception mean scores ($p<0.001$; see Table S4 in supplementary material).

Discussion

This study, conducted to analyse the relationship between mothers' breastfeeding self-efficacy and their perception of insufficient milk, determined that mothers' breastfeeding self-efficacy and perception of insufficient milk mean scores were medium level and required improvement (see Table S1 in supplementary material). The high mean scores in breastfeeding self-efficacy and perceived insufficient milk scale indicate successful breastfeeding (8) so the average of the scores received by mothers were not enough in the study and must be upgraded. Healthcare professionals should identify a mother's willingness for breastfeeding, the support provided by her spouse and close circle, the perception of self-efficacy of the mother and whether her milk is sufficient for breastfeeding. Since nurses are in a position to spend more time with the mother during the breastfeeding process especially, they need to focus on these factors and try to change and improve these factors in order to improve breastfeeding success. Thus, in addition to informing mothers about breastfeeding, they would be able to work to transform this information into behaviour (17).

The perception of insufficient milk is a difficulty that persists throughout the lactation process for women who are at risk of stopping breastfeeding during the early postpartum days (11). Chan *et al.* reported that 77% of mothers whose infants were hospitalized in the newborn intensive care unit fed their infants with supplementary foods due to their insufficient milk perception during the periods they

stayed at the hospital (18). In addition, a study by Binns and Scott specified that 16.7% of women stopped breastfeeding due to their insufficient milk perception before they were discharged from the hospital and 23% had anxiety problems due to their insufficient milk perception upon discharge from the hospital (19). In a study conducted by O'Campo *et al.*, factors affecting breastfeeding were evaluated and it was found that one of the most important factors determining breastfeeding results was the mother's self-efficacy perception (10). Mothers with high breastfeeding self-efficacy believe they produce sufficient amounts of milk to cope with breastfeeding challenges; however, mothers who doubt their breastfeeding skills start supplementary foods earlier due to their perception of insufficient milk. In this Turkish hospital study, a positive significant relationship was found between the breastfeeding self-efficacy levels of mothers and their perception of insufficient milk. As the mothers' breastfeeding self-efficacy levels increased, their perception of seeing their milk as more sufficient also increased (see Table S1 in supplementary material). If a mother's breastfeeding self-efficacy level is low, this leads her to see her milk as insufficient, thus supplementing her perceived insufficient breast milk with formula. This begins to decrease actual milk supply and production and ends with the cessation of breastfeeding (14). In the study of Blyth *et al.*, there was a relationship between the perception of insufficient milk and breastfeeding self-efficacy scores (8). In their study, McCarter-Spaulding and Kearney showed that there was a significant relationship between the perception of insufficient milk and self-efficacy scores (13). Low breastfeeding self-efficacy perception decreased a mother's belief that she can produce sufficient milk for her infant. Results of current related studies support the results of this study.

This study found higher breastfeeding self-efficacy levels in mothers in the advanced age group and mothers in the higher education group than groups of younger mothers and those with minimal education. Those mothers with the higher levels perceived their milk to be more sufficient (see Table S2 in supplementary material). In the study by Goulet *et al.*, it was found out that education levels and ages of mothers are important factors in making the decision to breastfeed and continuation of breastfeeding (20). In other conducted studies, successful breastfeeding numbers of young and uneducated mothers were found to be lower (8,21).

Characteristics such as having high levels of education and income affect the breastfeeding process positively. In this study, breastfeeding self-efficacy levels and milk sufficiency perceptions of mothers with higher income levels were found to be significantly raised (see Table S2 in supplementary material). In previous studies conducted regarding this subject, it was determined that mothers at lower socio-economic levels had shorter breastfeeding periods and tended to feed their infants with formula (9,22).

In this study, mothers of male infants had higher breastfeeding self-efficacy levels and perceived their milk to be more sufficient. This finding may result from a common belief in the eastern and south-eastern regions of Turkey: male children are considered more important to the family than female children and such a cultural bias may have affected this gender characteristic.

This study found that mothers who planned their pregnancies had higher breastfeeding self-efficacy and perception of insufficient milk mean scores (see Table S3 in supplementary material). In another conducted study, it was found that women who had planned their pregnancies established more positive mother–child relationships and adapted to the role of motherhood more easily than those who did not plan their pregnancies (23). Unplanned pregnancy and birth experiences affect the mother's desire to perform other new activities as well as breastfeeding and affects the mother's breastfeeding self-efficacy perception negatively (12).

When compared, mothers who delivered vaginally had higher breastfeeding self-efficacy scores than mothers who had a Cesarean birth. This study determined that they perceived their milk to be more sufficient (see Table S3 in supplementary material). To begin the mother–child relationship immediately, uncomplicated vaginal birth is suitable for starting breastfeeding behaviour earlier than cesarean delivery as the infant is not under the influence of anaesthesia (24). After a Cesarean delivery in Turkey, the infant is taken to the newborn intensive care unit, requiring mothers to be away from their infants longer than mothers who had typical vaginal deliveries. Mothers who had Cesarean deliveries and whose infants stayed in the newborn intensive care unit were physically separated from their infants for the first few days. They may have tried pumping their milk to be able to send

something to their infants and this may have caused them to perceive their milk to be more sufficient. In another conducted study, it was found that mothers who had Cesarean deliveries need more support than vaginal deliveries (25). In addition, in a study by Snawky and Abalkhail, mothers who delivered Cesarian had more problems about breastfeeding compared to mothers who delivered vaginally (26).

According to the statements of mothers reviewed within the scope of this study, the number of children had a positive effect on the breastfeeding self-efficacy and milk sufficiency perception (see Table S3 in supplementary material). Another study determined that breastfeeding behaviours of primipara mothers and multipara mothers were different (24). It was observed that previous breastfeeding experiences of women who had two or more pregnancies affected their behaviours while feeding their babies from their most recent pregnancies. When multipara mothers with breastfeeding experience were compared with primipara mothers, it was determined that experienced mothers had higher breastfeeding self-efficacy scores (2,27).

In this study, it was determined that mothers who had breastfeeding experience had higher breastfeeding self-efficacy levels and perceived their milk to be more sufficient (see Table S4 in supplementary material). In a different study, when women with previous breastfeeding experiences were compared to women with no breastfeeding experiences, significant differences were found between self-efficacy scores of the first postpartum week and the fourth postpartum month (8). In a study by Hill *et al.*, it was reported that women with previous breastfeeding experience had less perception of insufficient milk compared to mothers breastfeeding for the first time (28).

This study determined that the mothers who received breastfeeding training had higher self-efficacy levels and perceived their milk to be more sufficient (see Table S4 in supplementary material). In a study by Gijsbers *et al.*, a positive relationship was found between breastfeeding information levels and duration of breastfeeding (29). In addition, in a study by Küçükoğlu and Çelebioğlu, breastfeeding training provided for mothers after delivery increased, to a great extent, the mothers' breastfeeding self-efficacy levels and rates of feeding exclusively breast milk (5).

Mothers who breastfed their infants immediately after delivery (within the first 30 minutes) were found to have higher breastfeeding self-efficacy and higher milk sufficiency perception mean scores (see Table S4 in supplementary material). No study was found that examined whether breastfeeding duration affects the breastfeeding self-efficacy level and milk sufficiency perception. However, mothers staying in the unit where the study was conducted could communicate with their infants in the early periods and begin breastfeeding. This allowed the breastfeeding process to be more successful and may affect both breastfeeding self-efficacy levels and milk sufficiency perception positively.

In this study, a positive significant relationship was observed between the periods of time that mothers planned to feed their infants exclusively breast milk and breastfeeding self-efficacy and perception of insufficient milk mean scores. As breastfeeding self-efficacy levels increased, milk sufficiency perception also increased (see Table S4 in supplementary material). In a study by Taşçı and Turan, breastfeeding success of mothers who planned to breastfeed their infants for less than 12 months after birth was lower compared to mothers who planned to breastfeed longer (30). Similar results are also shown in a Bolsoy *et al.* study (31).

Conclusion

This study, conducted with the aim of analysing the relationship between mothers' breastfeeding self-efficacy and milk sufficiency perception, found significant differences between groups of mothers with different demographic characteristics and the Breastfeeding Self-Efficacy Scale and PIM Questionnaire mean scores. As breastfeeding self-efficacy levels of mothers increased, they perceived their milk to be more sufficient.

In consideration of these results, the following is recommended:

- Enhancing and expanding practices throughout the country that are intended to increase mothers' breastfeeding self-efficacy levels and milk sufficiency perception during the prenatal period in order to maintain a successful and efficient breastfeeding process after delivery.
- The healthcare professionals working in neonatal intensive care units are recommended

to show mothers that they have sufficient milk and the baby is breastfed adequately by presenting them concrete evidence.
- When providing consultancy services for breastfeeding, it is recommended to provide a comprehensive consulting service, which takes the perceptions of mothers about breastfeeding into account, as well as providing educational interventions.

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Conflict of interest

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