Determination of Factors Affecting Lactating Women's Perceptions of Insufficient Milk and the Foods They Use to Increase Breast Milk

Laktasyon Dönemindeki Kadınların Yetersiz Süt Algılarını Etkileyen Faktörler ve Anne Sütünü Artırmak için Kullandıkları Besinlerin Belirlenmesi

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ABSTRACT

Objective: Many factors affect breastfeeding rates. One of these factors is the mother's perception of insufficient milk. This study was conducted to determine the factors affecting lactating women's perceptions of having insufficient milk and the foods they used to increase the breast milk.

Methods: This descriptive study was conducted with 356 women. The data were collected using the "sociodemographic information form", the "form for determining the foods used by women to increase breast milk", and "perceived insufficient milk supply (PIMS)" scale. One-way analysis of variance, the independent samples t-test, the Bonferroni test, and Pearson correlation analysis were applied in the evaluation of the data.

Results: The mean PIMS score was 42.39±7.48, and 80.3% of the women perceived their milk to be sufficient. A significant relationship was found between the mean PIMS score of the participants and employment status (p<0.000), time of first breastfeeding (p<0.000), milk being produced immediately after birth (p<0.000), and having enough milk to meet the needs of the baby (p<0.000). It was found that women consumed it and found it beneficial for increasing breast milk by consuming herbs: 30.6% used fennel, 12.6% linden; beverages: 71.3% used water, 50.6% compote, and 28.7% soups; foods: 31.2% used bulgur wheat, 24.2% fruit.

ÖZ

Amaç: Emzirme oranlarını birçok faktör etkilemektedir. Bu faktörlerden biri de annenin yetersiz süt algısıdır. Bu çalışma laktasyon dönemindeki kadınların yetersiz süt algılarını etkileyen faktörler ve anne sütünü artırmak için kullandıkları besinlerin belirlenmesi amacıyla yürütülmüştür.

Yöntemler: Bu tanımlayıcı çalışma 356 kadın ile yürütülmüştür. Araştırma verileri, "sosyodemografik bilgi formu", "kadınların anne sütünü artırmak için kullandıkları besinleri belirleme formu" ve "yetersiz süt algısı ölçeği (PIMS)" ile toplanmıştır. Verilerin değerlendirilmesinde tek yönlü varyans analizi, bağımsız örneklem t-testi, Bonferroni testi, Pearson korelayon analizi uygulanmıştır.

Bulgular: Kadınların PIMS puan ortalamasının 42,39±7,48 olup, %80,3'ünün sütünü yeterli algıladığı belirlendi. Katılımcıların PIMS puan ortalaması ile çalışma durumu (p<0,000), ilk emzirme zamanı (p<0,000), doğumdan hemen sonra sütün gelmesi (p<0,000), bebeğin ihtiyacını karşılayacak kadar sütün olması (p<0,000) arasında anlamlı ilişki bulunmuştur. Kadınların anne sütünü artırmak için; bitkilerden %30,6 rezene, %12,6 ıhlamur, %6,2 maydanoz; içeceklerden %71,3 su, %50,6 komposto, %28,7 çorbalar; yiyeceklerden %31,2 bulgur pilavı, %24,2 meyve tükettikleri ve anne sütünü artırmada faydalı buldukları saptandı.

ABSTRACT

Conclusion: It was observed that most mothers perceived their milk supply as sufficient. It was determined that PIMS score was affected by working status, time of milk coming in after birth, and breastfeeding status immediately after birth. It was determined that mothers consumed the most fennel, linden, parsley, water, compote, soup, fruit juice, bulgur pilaf, fruit, raisins, green vegetables and molasses to increase their milk supply.

Keywords: Breast milk, breastfeeding, galactogogues, lactation

ÖZ

Sonuç: Annelerin çoğunun sütünü yeterli algıladığı görüldü. PIMS puanını çalışma durumu, doğumdan sonra sütün gelme zamanı ve doğumdan sonra hemen emzirme durumunun etkilediği saptandı. Annelerin sütünü artırmak için en fazla rezene, ıhlamur, maydanoz, su, komposto, çorba, meyve suyu, bulgur pilavı, meyve, kuru üzüm, yeşil sebzeler, pekmez tükettikleri belirlendi.

Anahtar Sözcükler: Anne sütü, emzirme, galaktogog, laktasyon

Introduction

Breast milk is the most important source of nutrients for maintaining neonatal health. In addition to providing the nutrients the newborn needs, it has many benefits for both mother and baby, such as protecting the newborn from various infections, reducing the risk of allergies, accelerating the mother's involution process, protecting against breast cancer, and aiding mother-child bondin (1). The United Nations Children's Fund and the World Health Organization (WHO) recommend that every infant should be exclusively breastfed for the first six months of life and then continue breastfeeding with supplementary food until the age of 2 (2,3). According to WHO, worldwide between 2015 and 2022 only approximately 44% of babies aged 0-6 months reported exclusive breastfeeding (3). It is worth mentioning that this rate is similar in Türkiye (40.7%) (4). Despite the numerous benefits of breast milk and the constant emphasis on its importance, one of the most prevalent reasons breastfeeding rates are not at the desired level is the perception that the mother's milk is insufficient (5). This stems from mothers' concerns that the quality and quantity of their milk is not adequate for their baby and that their baby is not fully fed (6,7). Results show that during the lactation period, many women immediately start formula or early supplementary food with the thought that their milk is insufficient, and some women terminate breastfeeding early (8,9). Therefore, it is crucial to identify the factors that cause this perception (5). However, the prevalence of the perception of producing insufficient milk has not been sufficiently addressed in the literature, and most studies have been conducted in Western countries (7).

In many societies throughout history, women have traditionally used herbs and nutrients to increase their milk (10,11). Although the foods used vary geographically, it is known that malt beverages, herbs such as fenugreek, goat psoriasis, bull thistle, anise, basil, and fennel seeds, and sweets such as confectionery similar to Turkish delight are generally used (10,12,13). Although the mechanisms of many foods that are thought to increase breast milk during the lactation period are unknown, they are widely used (14). Therefore, it has been recommended to increase the number of studies determining the nutrients used to increase breast milk in the literature (14).

Midwives, who spend the most time with women during pregnancy and after birth, should continue to support and maintain breastfeeding from the antenatal period until the point at which the baby is weaned. They should also take into consideration the perception of having insufficient milk, the foods that mothers consume to increase breast milk, and their attitudes towards, and knowledge and experiences of breastfeeding while developing women's breastfeeding behaviors (11,14).

The literature shows that studies on the perception of having insufficient milk and the nutrients used for increasing breast milk are quite limited (15,16). For this reason, this study was conducted to determine the factors affecting the perception of insufficient milk and the nutrients used by lactating women to increase breast milk.

Methods

Study Design

This study had a descriptive design. The population of the study consisted of mothers with infants aged 0-24 months who came to the Obstetrics and Gynecology and Pediatric Outpatient Clinics of a Maternity Hospital in the north of Türkiye for follow-up. The research was conducted between April 10, 2022, and April 10, 2023. The sample size was calculated using the Epi Info StatCalc program and data from the previous year (2021) (n=4656). The sample size was determined as 355 with a 95% confidence interval, 5% type-1 error level, 50% prevalence, "design effect", and "cluster" 1. The study was completed with 356 women using the random sampling method.

This study was conducted in compliance with the Helsinki Declaration. And informed consent was obtained from all participants before starting the study.

Criteria for inclusion in the study;

- 18 years and over,

- Not having any problems that prevent breastfeeding (such as neurological disease, medication use, psychological illness, mastitis),

- Not having any problem that would affect breastfeeding (anatomical, physiological and neurological disorders, etc.),

- Having a baby aged 0-24 months,

- No problems with vision or hearing,

- Breastfeeding and volunteer mothers were included in the study.

Exclusion criteria from the study;

- Under 18 years old,

- Having any problems that prevent breastfeeding (such as neurological disease, medication use, psychological illness, mastitis),

- Having a problem that affects breastfeeding (anatomical, physiological and neurological disorders, etc.),

- Having a baby over 24 months,

- Having problems with vision or hearing,

- Mothers who did not breastfeed and did not volunteer were excluded from the study.

Procedure

The research data were obtained by the researchers through face-to-face interviews with the women. Before the data collection, each woman participating in the research was given the necessary information about the purpose of the study and the research method of the research, and the data collection then started and lasted an average of 10-15 minutes.

Data Collection

The research data were collected with the sociodemographic information form prepared by the researchers in line with the literature, the form for determining the foods women use to increase breast milk, which is a checklist of foods that increase breast milk, and the perceived insufficient milk supply (PIMS) scale (9-11,13,17).

Sociodemographic Information Form: This form consisted of 16 questions inquiring about socio-demographic (age, education level, income level, etc.), obstetric (number of living children, mode of delivery, etc.), and breastfeeding characteristics (breastfeeding time, breastfeeding education, etc.).

Form for Determining the Foods Women Use to Increase Breast Milk: Herbs, liquid foods, and solid foods consumed by women to increase breast milk were listed. This form contained information about the mothers' use of these and the benefits from them.

Perceived Insufficient Milk Supply Scale: This scale, which was developed by McCarter-Spaulding in 2001 to determine perceptions of having insufficient breast milk, is a form consisting of six questions. The first question asks whether the mother perceives her milk to be sufficient. The mother answers this question as "yes" or "no". The other questions aim to measure the degree of perception of having insufficient milk. The mother is asked to score these questions between 0-10. Zero indicates that milk is perceived as completely insufficient, and 10 indicates that the milk is perceived as completely adequate. A minimum score of 0 and a maximum score of 50 can be obtained from the scale. A higher total score indicates the milk is perceived to be more sufficient. In the original scale, the Cronbach's α value was determined as 0.81 (18). The Turkish validity and reliability study of the scale was conducted by Gökçeoğlu (19) and Küçükoğlu and the Cronbach's α value was found to be 0.82. In the current study, the Cronbach's α value was determined as 0.80.

Ethical Principles of the Research: Ethical permission for the research was obtained from the Social and Human Sciences Research Ethics Committee of Ondokuz Mayıs University (decision no: 2021-803, date: 22.10.2021). The data collection process was initiated after the ethics committee and institutional permission was obtained.

Statistical Analysis

The data were analyzed with the SPSS 25.0 (IBM SPSS Statistics for Windows, Version 25.0) program after the researchers had checked for errors. In the evaluation of the data, number, percentage, mean, and standard deviation were used as descriptive statistical analyses, and their distribution was tested by the Kolmogorov-Smirnov test. One-way analysis of variance and the independent samples t-test were used for intergroup comparisons. Bonferroni test was used for within-group comparisons. Pearson correlation analysis was used to determine the relationship between numerical data and the scale scores. The statistical significance level was accepted as $p < 0.05$ in the evaluation of the results.

Results

In Table 1, the minimum and maximum scores obtainable from the PIMS scale and the mean scores for the scale are given. The results showed that women had a minimum score of 16 and a maximum score of 50, and the mean score of the scale was 42.39±7.48, indicating that they had a strong perception that their milk was sufficient. It was determined that 80.3% of the participants perceived their milk to be sufficient (Table 1).

Table 2 shows that there was a significant correlation between the mean total score for the PIMS scale and employment status ($p < 0.000$), whereas no significant correlation was found between maternal age ($p = 0.865$), birth week ($p = 0.435$), the number of living children ($p = 0.297$), educational level ($p = 0.268$), income level ($p = 0.459$), planned pregnancy status ($p = 0.129$), and mode of delivery ($p = 0.806$) (Table 2).

As seen in Table 3, there was a significant relationship between the mothers' total mean score for the PIMS scale and the time of first breastfeeding ($p < 0.000$), milk coming immediately after birth ($p < 0.000$) and having enough milk to meet the baby's needs ($p < 0.000$), while breastfeeding experience ($p < 0.000$), the first food given to the baby ($p = 0.303$) and the status of receiving breastfeeding education ($p = 0.05$) were not found to be significant (Table 3).

As seen in Table 4, the women found it beneficial to increase breast milk by consuming herbs: fennel was used by 30.6%,

linden by 12.6%, and parsley by 6.2%; beverages: water was used by 71.3%, compote by 50.6%, soups by 28.7%, and fruit juice by 21.1%; foods: bulgur wheat was used by 31.2%, fruit by 24.2%, raisins by 23.3%, green vegetables by 20.5%, and molasses by 19.9% (Table 4).

Discussion

The findings of this study, which examined the factors affecting lactating women's perceptions of having insufficient milk and the foods they used to increase breast milk, were discussed here in relation to the relevant literature. In this study, more than three-quarters of the participants perceived their milk to be sufficient, which is the highest value in the literature in terms of similar studies. When other studies conducted in the literature using the same scale (PIMS) were examined, these rates were

73.1% in Japan (20), 60.2% in Pakistan (21), 50-55.7% in Australia (22), 41.1% in China (23), 37.3% in Singapore (24), 18.4% in the USA (25), 14.9-23.6% in Mexico (26), and 7.5-18% in Canada (27). The fact that the value in this study is higher than in other studies suggests that studies conducted to increase breast milk have started to yield results, and women have started to see their milk as sufficient since the data are recent.

According to a comprehensive systematic review of 27 studies on mothers' perceptions of insufficient milk between 2000 and 2021, factors such as birth week, educational status, income level, sex of the newborn, breastfeeding experience, parity, mode of delivery, planned pregnancy, the psychological status of the mother, breastfeeding education, skin-to-skin contact, and the crying of the newborn all affect PIMS (5). In addition, in a

Table 1. Minimum and maximum scores obtainable from the PIMS scale and the mean scores for the scale (n=356)

Scale	Min-max score obtainable	Min	Max	Mean ± SD
PIMS scale	0-50	16	50	42.39±7.48
Perception of milk as sufficient	**Yes**	**No**		
	286 (80.3%)	70 (19.7%)		

PIMS: Perceived insufficient milk supply, SD: Standard deviation, Min: Minimum, Max: Maximum

Table 2. Comparison of sociodemographic and obstetric characteristics of the mothers with the mean total scores for the PIMS scale (n=356)

Variables	Average	Min-max	Applied test, p-value
Age	28.67±5.12	18-43	r=-0.009, p=0.865
Birth week	38.16±2.13	26-42	r=0.42, p=0.435
Number of living children	1.84±0.87	1-5	r=0.55, p=0.297
Variables	n (%)	PIMS scale mean score	
Educational level			F=1.322, p=0.268
Primary education	123 (34.5)	41.78±7.83	
High school	119 (33.4)	42.20±8.29	
University and above	114 (32)	43.32±6.05	
Income status			F=0.907, p=0.459
Income lower than expenditure	108 (30.3)	41.62±7.77	
Income equal to expenditure	216 (60.7)	42.80±7.17	
Income higher than expenditure	32 (9)	42.28±8.54	
Employment status			F=3.757 p<0.000
Employed	34 (9.6)	40.50±7.90[a]	
Unemployed	261 (73.3)	42.14±7.74[a]	
Not working due to childbirth	61 (17.1)	44.52±5.51[b]	
Planned pregnancy status			t=1.520 p=0.129
Planned	245 (68.8)	42.80±6.99	
Unplanned	111 (31.2)	41.50±8.42	
Mode of delivery			t=-0.246 p=0.806
Normal birth	116 (32.6)	42.25±7.41	
Cesarean section	240 (67.4)	42.46±7.50	

X ± SD: Mean ± standard deviation
r: Pearson correlation analysis, [a,b]: Letters indicating statistically significant differences between groups according to the Bonferroni test. There is no statistically significant difference between groups with the same letter. F: One-way analysis of variance, t: Independent samples t-test, min-max: Minimum-maximum

recent study conducted with 370 mothers in the USA, it was found that age and planned breastfeeding duration affected PIMS (28). In the current study, in addition to the studies in the literature, it was determined that employment status, breastfeeding immediately after birth, and breastfeeding the baby as much as the baby needed negatively affected PIMS. That is, these women believed that their milk was more sufficient. This suggests that the factors that may affect the perception of having insufficient milk may vary from woman to woman, which may be due to the difference in the selected samples and the number of participants. Therefore, it is very important for health professionals to take a detailed history from the mothers to whom they provide care and counseling and to identify these factors to maintain breastfeeding.

Maternal nutrition is considered by breastfeeding mothers to be an important factor affecting the amount of breast milk (29,30). Mothers therefore consume various foods to increase their milk

Table 3. Comparison of the breastfeeding characteristics of the mothers and the mean total scores for the PIMS scale (n=356)

Variable	n (%)	PIMS scale mean score	Test, p-value
Breastfeeding experience			t=1.794, p=0.74
Yes	210 (32.6)	42.99±7.24	
No	146 (67.4)	41.54±7.76	
Time of first breastfeeding			F=4.432, p<0.000
Immediately after birth	188 (52.5)	43.14±6.70[a]	
1-2 hours after birth	105 (29.5)	40.59±8.46[b]	
3 or more hours after birth	63 (17.7)	43.19±7.56[a]	
First food given to the baby			t=1.031 p=0.303
Breast milk	276 (77.5)	42.61±7.16	
Baby food	79 (22.5)	41.63±8.51	
Did you produce milk immediately after giving birth?			F=13.753, p<0.000
Milk had come	190 (53.4)	44.16±5.87[a]	
Milk didn't come	56 (15.7)	38.96±8.87[b]	
Had very little milk	110 (30.9)	41.10±7.48[b]	
Breastfeeding education status			t=2.821, p=0.05
Yes	88 (24.7)	44.17±6.45	
No	268 (75.3)	41.81±7.71	
Did you have enough milk to meet your baby's needs?			
Yes	273 (76.7)	44.39±5.65	t=10.274, p<0.000
No	83 (23.4)	35.83±9.03	
Who helped you increase your milk supply?*			
Older family members	159 (44.7)		
Health personnel	87 (24.4)		
My friends	61 (17.1)		
Internet sources	124 (34.8)		
What increases your milk?*			
Herbs and teas	253 (71.1)		
Desserts and similar foods	170 (47.8)		
Sleep	239 (67.1)		
Shower	245 (68.8)		
Rest	198 (55.6)		
Medicines	19 (5.3)		
Social support	87 (24.4)		
Exercise	38 (10.7)		
Midwife/nurse support	76 (21.3)		

X ± SD: Mean ± standard deviation
[a,b]: Letters indicating statistically significant differences between groups according to the Bonferroni test. There is no statistically significant difference between groups with the same letter.
F: One-way analysis of variance, t: Independent samples t-test.*: Participants chose more than one option

(14). In this study, it was found that the mothers benefited the most by consuming herbs such as fennel, linden, and parsley; beverages such as water, compote, soups, and fruit juice; and foods such as bulgur wheat, fruit, raisins, green vegetables, and molasses. Other studies conducted in Türkiye also showed that mothers consumed similar herbs (fennel, linden, and parsley etc.), foods (bulgur wheat, fruit, raisins, green vegetables, molasses, etc.) and beverages water, compote, soups, fruit juice, etc.) (31-34). However, it has been determined that different foods are consumed in different countries to increase breast milk (15-17). In a scoping review of clinical studies on plant galactagogues worldwide 13 studies were found, and it was determined that mothers consumed fenugreek, goat's rue,

milk thistle, carduus, stinging nettles, melissa, caraway, anise, fennel, lemongrass, banana flower, ginger, malunggay and Asparagus racemosus (17). A study conducted in New Zealand found that mothers consumed commercially-available lactation cookies, lactation teas, and lactation blends to increase milk (15). Australian mothers consumed lactation cookies, brewer's yeast, fenugreek, and domperidone (16). In a study conducted in Malaysia, lactogenic biscuits made of banana flower extract of Musa x paradisiaca were used (35). Considering that each country has different eating habits, it is normal that the foods consumed by mothers vary from country to country. This may be the reason why the results of different studies conducted in our country are similar. This shows that there are differences

Table 4. Foods consumed/not consumed by mothers to increase milk (n=356)			
Plants consumed/not consumed by mothers*	Consumed with no benefit % (n)	Consumed and benefited % (n)	Not consumed % (n)
Fennel	16.3 (58)	30.6 (109)	53.1 (189)
Linden	9.6 (34)	12.6 (45)	77.8 (277)
Parsley	5.9 (21)	6.2 (22)	87.9 (313)
Aniseed	1.7 (6)	4.5 (16)	93.8 (334)
Nettle	2 (7)	2 (7)	96.1 (342)
Beverages consumed/not consumed by mothers*			
Water	11.8 (42)	71.3 (254)	16.9 (60)
Compote	14.6 (52)	50.6 (180)	34.8 (124)
Soups	14.6 (52)	28.7 (102)	56.7 (202)
Fruit juice	8.1 (29)	21.1 (75)	70.8 (252)
Puerperium sherbet	9.6 (34)	17.7 (63)	72.8 (259)
Buttermilk	6.2 (22)	14 (50)	79.8 (284)
Tea	7.6 (27)	12.6 (45)	79.8 (284)
Milk-forming instant teas	2 (7)	12.1 (43)	86 (306)
Sugar water	4.5 (16)	9.8 (35)	85.7 (305)
Cow's milk	6.7 (24)	3.9 (14)	89.3 (318)
Zamzam water	1.7 (6)	3.9 (14)	94.4 (336)
Foods consumed/not consumed by mothers*			
Bulgur wheat	12.9 (46)	31.2 (111)	55.9 (199)
Fruit	12.4 (44)	24.2 (86)	63.5 (226)
Raisins	8.1 (29)	23.3 (83)	68.5 (244)
Green vegetables	12.1 (43)	20.5 (73)	67.4 (240)
Molasses	12.9 (46)	19.9 (71)	67.1 (239)
Tahini halva	8.7 (31)	16.9 (60)	74.4 (265)
Meat/chicken/fish	12.1 (43)	14.6 (52)	73.3 (261)
Salad	11.5 (41)	13.5 (48)	75 (267)
Hazelnuts/pistachios	11 (39)	18 (64)	71.1 (253)
Desserts	8.7 (31)	16.3 (58)	75 (267)
Figs	7 (25)	13.5 (48)	79.5 (283)
Onions	5.6 (20)	8.4 (30)	86 (306)
Dried beans/chickpeas	2.5 (9)	5.1 (18)	92.4 (329)
Potatoes	5.3 (19)	4.2 (15)	90.4 (322)
*: Participants chose more than one option			

in the foods consumed due to the cultural and geographical differences between countries. The lack of studies on the side effects of the plants used in the literature is also noteworthy (17). For midwives who provide breastfeeding counseling to mothers to be better informed about the side effects of the herbs used, studies with adequate levels of evidence are required.

Study Limitations

The study data were collected based on self-reporting by participants, and the information they provided was assumed to be correct. At the same time, since the study sample consisted only of women admitted to the abovementioned hospital, the fact that the results obtained cannot be generalized to all women in Türkiye is a limitation of the study.

Conclusions

The results showed that most of the mothers included in the study perceived their milk to be sufficient. The hope is that this will contribute to the literature in terms of being the study in which the rates of having the perception of producing sufficient milk are at their highest. Factors affecting the perception of insufficient milk were found to include employment status, the time that milk was first produced after birth, and breastfeeding immediately after birth. It was concluded that mothers benefited the most by consuming herbs such as fennel, linden, and parsley, beverages such as water, compote, soups, and fruit juice, and foods such as bulgur wheat, fruit, raisins, green vegetables, and molasses to increase their milk. When all the results were taken into consideration, it was seen that there were, nevertheless, mothers who perceived their milk to be insufficient, and that the mothers consumed different plants and foods to increase their milk. However, the mechanism of action of these nutrients is not well known. Therefore, it is recommended to conduct randomized controlled studies to understand the benefits and harms of the foods, herbs, and beverages consumed by mothers. In addition, midwives can contribute to preventing the mother's perception of inadequacy after birth by providing breastfeeding training to expectant mothers before birth. At the same time, midwives can use their care and consultancy role to identify factors that may cause mothers to perceive insufficient milk and be effective in eliminating the problems.

Ethics

Ethics Committee Approval: Ethical permission for the research was obtained from the Social and Human Sciences Research Ethics Committee of Ondokuz Mayıs University (decision no: 2021-803, date: 22.10.2021).

Informed Consent: This study was conducted in compliance with the Helsinki Declaration.And informed consent was obtained from all participants before starting the study.

Authorship Contributions

Concept: E.K., Ş.R., S.Ö.A., Design: E.K., Ş.R., Data Collection or Processing: E.K., S.Ö.A., Analysis or Interpretation: E.K., Ş.R., Literature Search: E.K., Writing: E.K., Ş.R., S.Ö.A.

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