

Original Article

## Turkish Adaptation of the Six Point Breast Engorgement Scale: A Study of Validity and Reliability

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### Abstract

**Background:** Breast engorgement is a serious condition that should be evaluated objectively affecting mother and baby.

**Objective:** The aim of this study is to validate the Turkish validity and reliability of the 6-point breast fullness assessment scale to describe changes in the breast during breastfeeding in the first 14 days postpartum.

**Methodology:** It is a cross-sectional, descriptive study. The research was carried out with 49 women who gave birth at specified date intervals, met inclusion criteria, agreed to participate in the research and completed follow-up process. First assessment of the scale was made by each puerperant and the researcher, and the puerperant women were asked to evaluate breast engorgement twice a day after breastfeeding every morning and evening. Postpartum monitoring was continued for 14 days.

**Results:** Ages of women participating in the research are minimum 20 and maximum 45 years and their mean age is  $27.91 \pm 4.97$ . They have at least 1 and at most 5 children and mean number of children is  $1.95 \pm 0.81$ . Scale scores were compared in terms of education, age, first breastfeeding time, family type, number of children and type of childbirth. A statistically significant relationship was found between type of childbirth and scale scores. Higher scale score was found in caesarean delivery.

**Conclusion:** The days when breast engorgement increases as the literature indicates and the ones when this increase has been seen on the scale showed similar results. It was decided that the scale could be used by women in the evaluation and follow-up of breast filling.

**Keywords:** Breast feeding, engorgement, midwifery, nursing

### Introduction

One of the most important stages of the postnatal period is when the mother starts breastfeeding her baby. Benefits of breastfeeding to the mother and baby are not limited to the postpartum period and they continue throughout life. Among its benefits for the baby are supporting sensory and cognitive development, protecting against infectious diseases, asthma, eczema and allergic diseases, reducing the risks of obesity and type 2 diabetes; and for the mother are reducing the risk of ovarian cancer, contributing to postpartum recovery and helping to return to pre-pregnancy weight (Turkey

Nutrition Guide, 2015). Although breastfeeding is recommended for the first 6 months in infant feeding due to these known benefits, rate of exclusive breastfeeding in babies aged 0-1 months in our country is 59.2% (Hacettepe University Institute of Population Studies, 2019). Studies have reported among the reasons that interrupt the breastfeeding process as traumatic birth, belief that mother's milk is insufficient, giving the baby any fluids other than breast milk earlier, mother being sick or having to use medication, inability to breastfeed because of baby's sickness, mother

having nipple crack and breast engorgement (Amaral et al., 2015; Tarrant et al., 2011; Li et al., 2008). In a systematic review conducted in our country, it was reported that women commonly experience preventable problems such as pain, tenderness, redness, heat exchange, cracks, wounds, bleeding, mastitis, swelling, and engorgement during breastfeeding (Karaçam & Sağlık, 2018). A breast engorgement is caused by baby's inability to empty a breast completely especially on the 4-6th days when milk increases due to taking infant formula before learning to suck the breast (Turkyilmaz, 2016). Therefore, it is stated that the breasts should be emptied completely in each breastfeeding (Turfan, 2017). Medication applications, hot and cold applications, cabbage leaf application, breast massage and milking are seen as problem-solving approaches in cases where breasts are overfilled with milk and pain is felt (Gresh et al., 2019). It is also reported that mothers of newborns who are breastfed more in the first 48 hours have less breast engorgement (Berens et al., 2016). A research reports that consultancy services provided by healthcare professionals in postpartum period will prevent or reduce breast problems that may occur during the breastfeeding period (Elwelely & Mansour, 2018). Breast engorgement should be assessed in order to identify these problems earlier. Yet, there is no assessment tool with validity and reliability in Turkish. The aim of this study is to validate the Turkish validity and reliability of the 6-point breast fullness assessment scale to describe changes in the breast during breastfeeding in the first 14 days postpartum.

**Methodology:** It is a cross-sectional, descriptive study. The research was carried out in XXX University Training and Research Hospital's Obstetrics Service. The institution is a baby-friendly hospital. Population of the research consists of 390 puerperant women who were hospitalized in Obstetrics and Gynecology Service between 07.15, 2018 and 01.15, 2019. Sample selection was not made. The research was carried out with 49 women who gave birth at specified date intervals, met inclusion criteria, agreed to participate in the research and completed follow-up process. Since Tabanick and Fidell reported that as 5 participants are sufficient for each item in the scale and the scale is single-itemed, the number of participants is considered sufficient for the scale

adaptation research (Tabanick & Fidell, 1996). Figure 1 demonstrates a flow chart of the questionnaire application.

Inclusion criteria:

- Mother's age being 18 and over,
- Gestational age being 37 weeks and above,
- Weight of the baby being 2500 gr or more,
- The baby having no obstacle to suck its mother.

Exclusion criteria:

- Mother's refusal to participate in the study,
- Being illiterate.

The data for the research were obtained by using questionnaire including descriptive characteristics and the Six-item Breast Engorgement scale questions.

**Six-Item Breast Engorgement Scale:** For the adaptation of the six-item breast engorgement scale developed by Hill and Humenick (1994) and used in various research (Eittah & Ashour 2019; El-Saidy & Aboushady, 2016; Priyanka et al., 2016; Disha, Singh & Suri, 2015; Sankanagoudar, Patil & Sirigeri., 2011), permission was first taken from Pamela Dee Hill via e-mail. The scale was translated into Turkish by two people who are specialized in English. For the Turkish and English versions of the scale, expert opinions were taken from three academicians who are experts in the fields of Pediatric Health and Disease Nursing, Gynaecology Nursing and Midwifery. Arrangements were made in line with the suggestions received. Final version of the scale was re-evaluated by an academician whose specialty was Turkish Language.

**Practice:** Researchers visited puerperant women in clinic every day, and the ones who met inclusion criteria were informed about the research. Descriptive information of the puerperant women on the first postpartum day who agreed to participate in the research were obtained by the researchers. First assessment of the scale was made by each puerperant and the researcher, and the puerperant women were asked to evaluate breast engorgement twice a day after breastfeeding every morning and evening. Postpartum monitoring was continued for 14 days.

**Analysis:** Descriptive data were assessed in terms of percentage and frequency. Normal distribution of the findings was made with Shapiro Wilk test.

In the non-normally distributed data, Mann Whitney U test was used if there were two groups and Kruskal Wallis tests were used if there were two or more groups. While assessing the data, SPSS 20 package program was used and  $p \leq 0.05$  was accepted as the statistical significance limit.

**Ethics:** Ethical consent was obtained from the Science Ethics Committee of XXX University (13.12.2018-30148) and the Institutional consent from the Provincial Health Directorate of XXX (26.09.2018- 91734550-772.02) in order to conduct the research. Mothers who met the inclusion criteria were informed about the research and written consent was obtained from those who accepted.

**Limitations:** Number of women who completed the research was limited as the research design required a 14-day follow-up and the puerperant women were discharged on the second day. 12.5% of the research

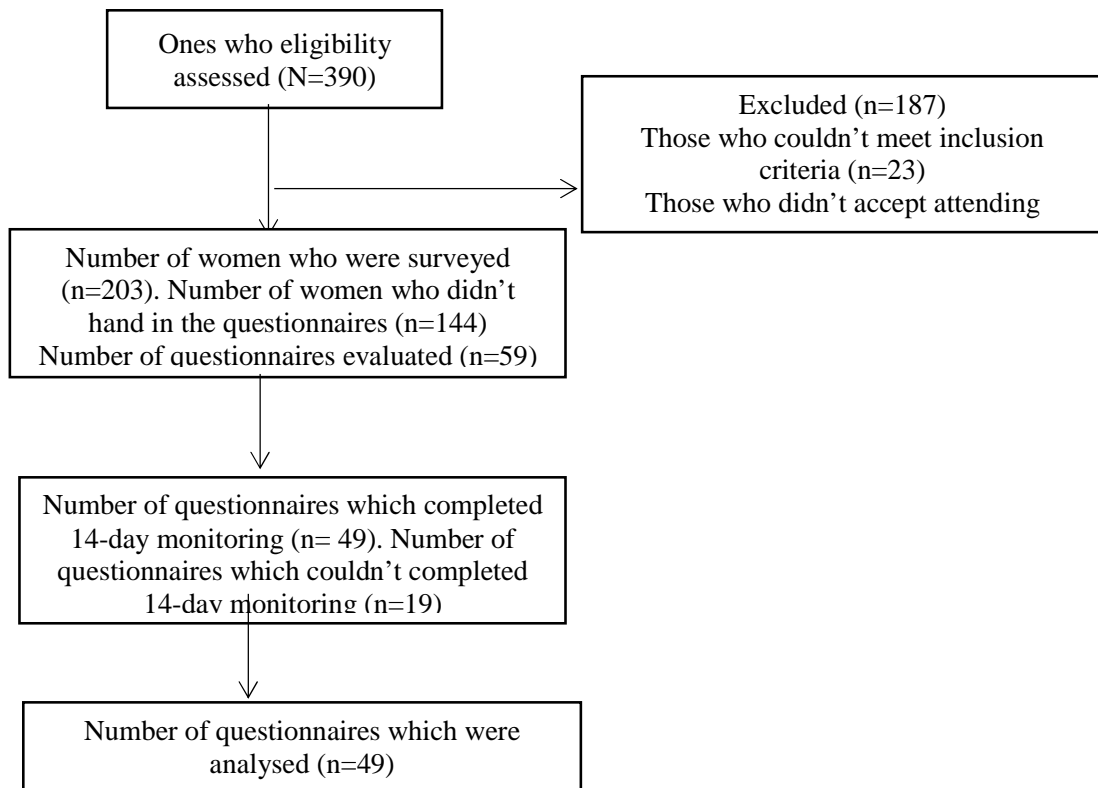
## Results

**Descriptive Properties:** Ages of women participating in the research are minimum 20 and maximum 45 years and their mean age is  $27.91 \pm 4.97$ . They have at least 1 and at most 5 children and mean number of children is  $1.95 \pm 0.81$ . Mean weight of their current babies is  $3356.10 \pm 446.81$ , mean height is  $51.10 \pm 263$ . and mean head circumference is  $35.00 \pm 1.19$ . Descriptive characteristics of women are given in Table 1.

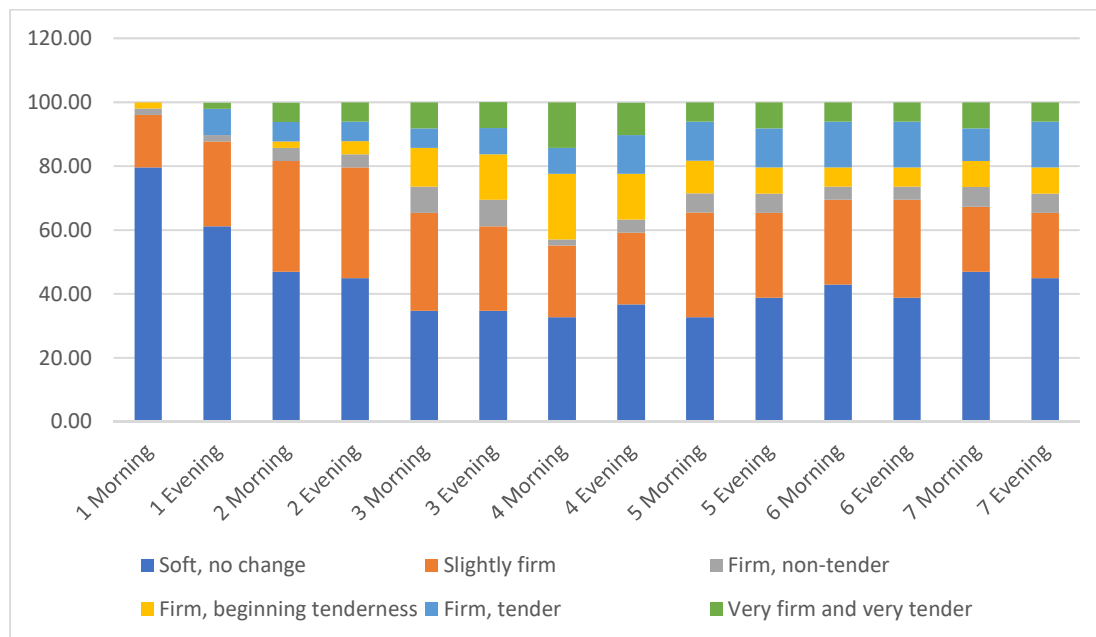
**Data on breastfeeding:** 81.6% of the population (40 women) stated that they did not have breast firmness problem and 18.4% (9 women) had this problem. Women who had breast firmness reported that they breastfed frequently (4 women), drank plenty of water (1 woman), applied massage (3 women), and applied cream to cope with this problem.

Almost half of the women (44.9% - 22 women) reported having breastfeeding problems, while 55.1% (27 women) reported that they had no problem in breastfeeding. For breastfeeding, 9 women stated that they had problems with the nipple, 9 stated that the babies had difficulty holding the breast, 2 stated that their milk supply was low, 1 stated that her baby had low blood sugar and 1 stated that her baby had sucking problem. While 34.7% of them (17 women) did not feed their babies other than breast milk, 65.3% (32 women) gave something other than breast milk in the 14-day period. Of these women, one gave Zamzam water and the other 31 gave formula. 59.2% (29 women) reported that they did not milk their breasts in 14-day period, but 12% (6 women) did it in the 1<sup>st</sup> day, 10,2% (5 women) in the 2<sup>nd</sup> day, 10,2% (5 women) in the 3<sup>rd</sup> day, 2% (1 woman) in the 4<sup>th</sup> day, 2% (1 woman) in the 5<sup>th</sup> day and 4.1% (2 women) in the 8<sup>th</sup> day, all caused by breast engorgement.

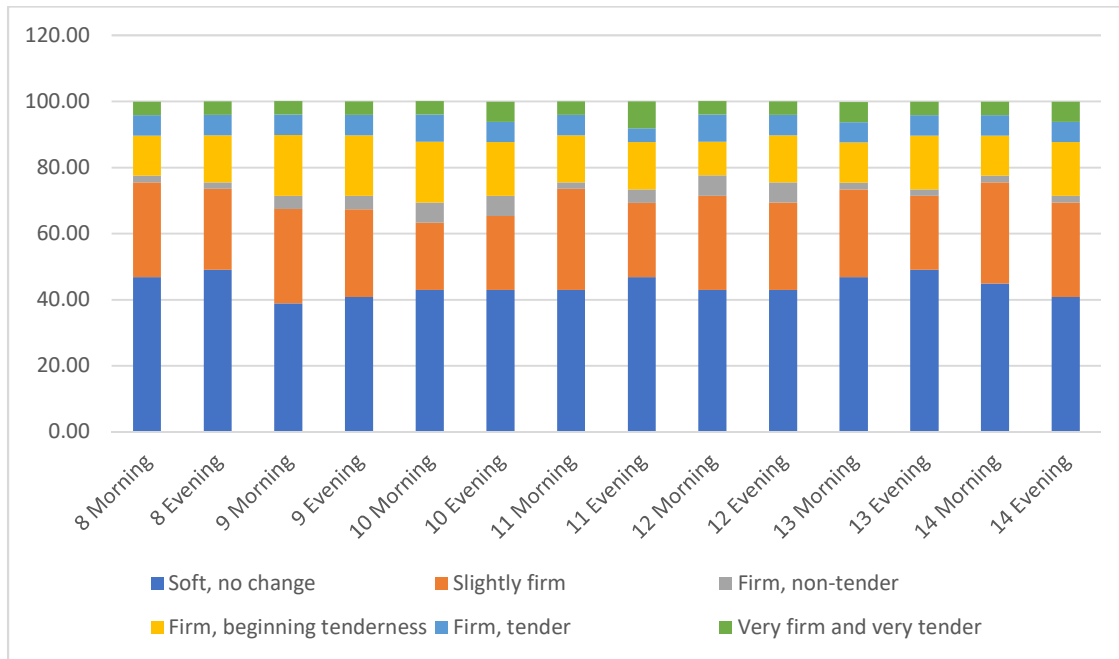
**Data regarding the scale score:** The total score mean of the scale is  $2.30 \pm 1.17$ . Day by day scale score means are shown in Graphic 3. Percentages and frequencies of puerperant breast engorgement scale scores for 14 days are given in Table 2. Change of breast engorgement scale scores in the first week can be seen as morning and evening for each day in Graphic 1. Change of breast engorgement scale scores in the second week can be seen as morning and evening for each day in Graphic 2. 14-day morning and evening scale score means of puerperant women are given in Graphic 3. Scale scores were compared in terms of education, age, first breastfeeding time, family type, number of children and type of childbirth (Table 3). A statistically significant relationship was found between type of childbirth and scale scores. Higher scale score was found in caesarean delivery.



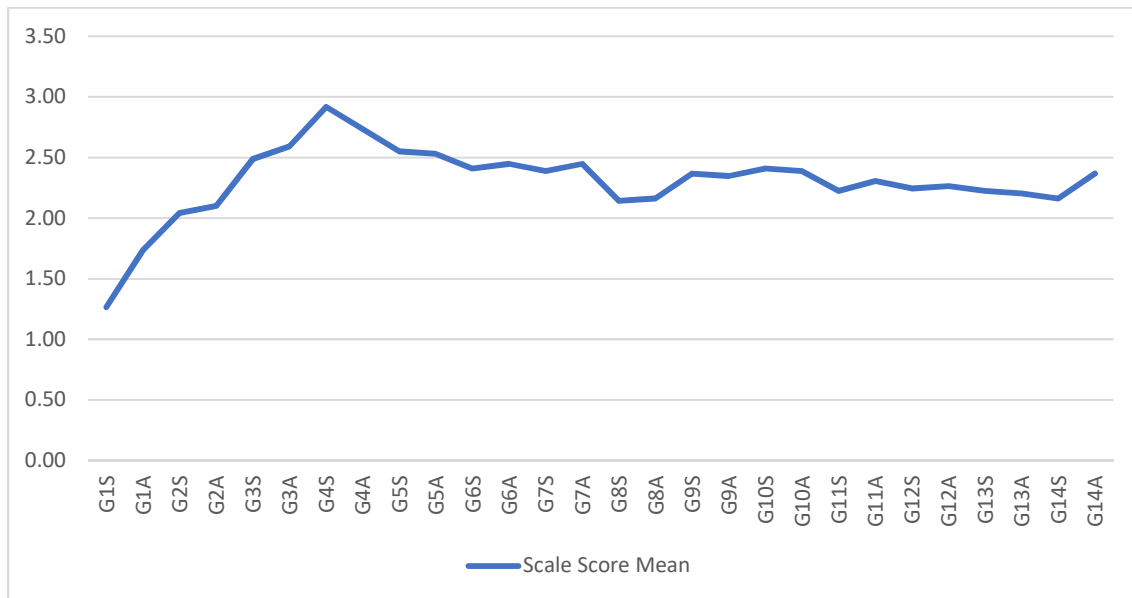
**Figure 1.** Flow chart of survey application



**Graphic 1.** Breast engorgement scale scores in the first week



**Graphic 2.** Breast engagement scale scores in the second week



**Graphic 3.** 14-day breast engagement scale score means

**Table 1.** Descriptive characteristics of women

Of the women;		n	%
Age	Between 20-25	16	32.7
	Between 26-30	18	36.7
	31 and above	15	30.6
Education	Primary	18	36.7
	High school	19	38.8
	College-University	12	24.5
Family Type	Nucleus	47	95.9
	Extended	2	4.1
Type of Childbirth	Normal	15	30.6
	Caesarean	34	69.4
Time of First Breastfeed	In the first 30 minutes	40	81.6
	Between 30th-60th	6	12.2
	Later than 60 minutes	3	6.1
Number of Children	1	14	28.6
	2	25	51.0
	3	9	18.4
	5	1	2.0
	Total	49	100

**Table 2.** Breast Engorgement assessment results

		Soft - no change (n) %	Slightly firm (n) %	Firm. non- tender (n) %	Firm. slightly tender (n) %	Firm. evidently tender (n) %	Very firm. very tender (n) %
1 <sup>st</sup> Day	Morning	79.6% (39)	16.4% (8)	2% (1)	2% (1)	0	0
	Evening	61.2% (30)	26.5% (13)	2% (1)	0	8.2% (4)	2% (1)
2 <sup>nd</sup> Day	Morning	46.9% (23)	34.7% (17)	4.1% (2)	2% (1)	6.1% (3)	6.1% (3)
	Evening	44.9% (22)	34.7% (17)	4.1% (2)	4.1% (2)	6.1% (3)	6.1% (3)
3 <sup>rd</sup> Day	Morning	34.7% (17)	30.6% (15)	8.2% (4)	12.2% (6)	6.1% (3)	8.2% (4)
	Evening	34.7% (17)	26.5% (13)	8.2% (4)	14.3% (7)	8.2% (4)	8.2% (4)
4 <sup>th</sup> Day	Morning	32.7% (16)	22.4% (11)	2% (1)	20.4% (10)	8.2% (4)	14.3% (7)
	Evening	36.7% (18)	22.4% (11)	4.1% (2)	14.3% (7)	12.2% (6)	10.2% (5)
5 <sup>th</sup> Day	Morning	32.7% (16)	32.7% (16)	6.1% (3)	10.2% (5)	12.2% (6)	6.1% (3)
	Evening	38.8% (19)	26.5% (13)	6.1% (3)	8.2% (4)	12.2% (6)	8.2% (4)
6 <sup>th</sup> Day	Morning	42.9% (21)	26.5% (13)	4.1% (2)	6.1% (3)	14.3% (7)	6.1% (3)
	Evening	38.8% (19)	30.6% (15)	4.1% (2)	6.1% (3)	14.3% (7)	6.1% (3)
7 <sup>th</sup> Day	Morning	46.9% (23)	20.4% (10)	6.1% (3)	8.2% (4)	10.2% (5)	8.2% (4)

	Evening	44.9% (22)	20.4% (10)	6.1% (3)	8.2% (4)	14.3% (7)	6.1% (3)
8 <sup>th</sup> Day	Morning	46.9% (23)	28.6% (14)	2% (1)	12.2% (6)	6.1% (3)	4.1% (2)
	Evening	49% (24)	24.5% (12)	2% (1)	14.3% (7)	6.1% (3)	4.1% (2)
9 <sup>th</sup> Day	Morning	38.8% (19)	28.6% (14)	4.1% (2)	18.4% (9)	6.1% (3)	4.1% (2)
	Evening	40.8% (20)	26.5% (13)	4.1% (2)	18.4% (9)	6.1% (3)	4.1% (2)
10 <sup>th</sup> Day	Morning	42.9% (21)	20.4% (10)	6.1% (3)	18.4% (9)	8.2% (4)	4.1% (2)
	Evening	42.9% (21)	22.4% (11)	6.1% (3)	16.3% (8)	6.1% (3)	6.1% (3)
11 <sup>th</sup> Day	Morning	42.9% (21)	30.6% (15)	2% (1)	14.3% (7)	6.1% (3)	4.1% (2)
	Evening	46.9% (23)	22.4% (11)	4.1% (2)	14.3% (7)	4.1% (2)	8.2% (4)
12 <sup>th</sup> Day	Morning	42.9% (21)	28.6% (14)	6.1% (3)	10.2% (5)	8.2% (4)	4.1% (2)
	Evening	42.9% (21)	26.5% (13)	6.1% (3)	14.3% (7)	6.1% (3)	4.1% (2)
13 <sup>th</sup> Day	Morning	46.9% (23)	26.5% (13)	2% (1)	12.2% (6)	6.1% (3)	6.1% (3)
	Evening	49% (24)	22.4% (11)	2% (1)	16.3% (8)	6.1% (3)	4.1% (2)
14 <sup>th</sup> Day	Morning	44.9% (22)	30.6% (15)	2% (1)	12.2% (6)	6.1% (3)	4.1% (2)
	Evening	40.8% (20)	28.6% (14)	2% (1)	16.3% (8)	6.1% (3)	6.1% (3)

**Table 3.** Comparison of descriptive characteristics and scale scores

Descriptive Properties		n	Mean rank	p
Age	Between 20-25	16	24.25	0.61*
	Between 26-30	18	27.53	
	31 and above	15	22.77	
Education	Primary	19	26.19	0.52*
	High school	19	25.29	
	College-University	11	20.36	
Family Type	Nucleus	47	24.52	0.25**
	Extended	2	36.25	
Type of Childbirth	Normal	15	17.70	0.01**
	Caesarean	34	28.22	
Time of First Breastfeed	In the first 30 minutes	40	24.39	0.48*
	Between 30th-60th	6	24.25	
	Later than 60 minutes	3	34.67	
Number of Children	1	14	25.64	0.84**
	2 and more	35	24.74	

\*Kruskal Wallis test, \*\*Mann Whitney U test

## Discussion

Lactogenesis consists of two stages: activation of milk secretion during pregnancy and postpartum. In the second stage, abundant milk production begins with the effect of high levels of prolactin hormone. While it is reported that most women experience the second stage of lactogenesis as engorgement in the breast with abundant milk production in the second and third days of postpartum (Pillay & Davis, 2020), there are also reports that breast engorgement will occur between 3-8 days postpartum (Michigan Medicine, 2017; Neville, 2001). Gresh et al. (2019) reported that breast engorgement was first seen within 24-48 hours. In line with the literature, our research indicates that breast engorgement first appears on the postpartum 3rd day. We saw in our research that 34.9% of women evaluate their breasts as slightly firm on the second postpartum day. Finding results supporting the literature also supports the idea that evaluation of the scale seems applicable. Thomas, Devi & George (2017), reported that 48% of the mothers experienced moderate postpartum breast engorgement on the 3rd day after caesarean section; Elwelely & Mansour (2018) reported it for 39% of them on the same day and Karatay, Gürarlan & Ergin (2018) did it for 60%, again on the same day.

Breast engorgement usually occurs in the first week after birth. If not treated properly, it will lead to more serious conditions such as breast infections, mastitis and premature weaning. Breast engorgement management should be done properly to increase the success of breastfeeding (Siregar & Hardjanti, 2019; Leung 2016). It is thought in light of this research that women can evaluate breast engorgement themselves using this scale and cope better with this problem by getting support from healthcare professionals.

In a research evaluating the effect of warm water compression on breast engorgement, mean scale score of the control group was 3.9, while the experimental group had 2.2 (Kaur & Priyadarshani, 2018). In a research conducted by Eithah and Ashour in which warm water compression was evaluated, 68% of the

participants in both the experimental and control groups sensed that their breasts were firm and there

was tenderness in the second day of postpartum, while breast engorgement was the same in the control group after the application, it decreased in the experimental group. In our research, the scale score mean is  $2.30 \pm 1.17$  on the same day and it is 2.59 on the third day, when it started to increase.

In a research by Gianni et al. (2019), it was observed that there was no relationship between the maternal education status and maternal age versus breast engorgement, to which we had a similar result in our research. In research, breast engorgement scale score versus age and family type were not found to be statistically significant, but there was a significant relationship between the type of childbirth and the time of first breastfeeding (Kaur & Priyadarshani, 2018). In this research, a statistically significant relationship was found only between the type of childbirth and the scale score. The breast engorgement scale score was found to be higher in women who had caesarean section.

**Conclusion:** Factor analysis and construct validity could not be evaluated due to the fact that the scale is single itemed and expert opinion was taken. The days when breast engorgement increases as the literature indicates and the ones when this increase has been seen on the scale showed similar results. Accordingly, it has been concluded that the Turkish version of the scale can be used.

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