Effect of Breast Massage on Reduction of Breast Engorgement among Postpartum Women

Rehab Sabry Fawzy Mohamed[1], Mervat ELshahat I. Shelil [2],

Inas Mohamed Abd-Allah [3]

[1]Assistant lecturer of Obstetrics and Gynecological Nursing, Faculty of Nursing - Suez Canal University, Ismailia, Egypt.

[2]Assist. Professor of Community Health Nursing, Faculty of Nursing - Suez Canal University, Ismailia, Egypt.

[3]Professor of Obstetrics and Gynecological Nursing, Faculty of Nursing - Suez Canal University, Ismailia, Egypt.

Abstract: **Breast engorgement occurs when milk first comes in breast and at other times which can create problems for both the breastfeeding mother and her baby. Aim of this study: evaluate the effect of breast massage on reduction of breast engorgement among postpartum women. Design: a quasi-experimental design was utilized in this study. Study sample: Purposive sample of 50 women with engorged breast. Setting: Suez Canal University Hospital and General Hospital at Ismailia City. Tools of data collection: I: an interview questionnaire II: Six-point engorgement scale III: visual analogue rating scale IV: Breast milk pH record V: Suckling speed record of neonate and VI: Latch Score record. Results: the entire studied sample had swelling and warmness (100.0%), and 32.0% had moderate engorgement while nearly two thirds of studied sample had severe pain (62.0%). After 5 days of intervention, the majority of the studied sample (80.0%) had normal breasts, 76.0% had no pain, 100.0% had alkaline milk PH and 100.0% had good breast feeding score. There were statistically significant differences between pre and post intervention with regard to signs and symptoms of breast engorgement, level of engorgement, intensity of pain and latch score (p < 0.05). Conclusion: Application of breast massage was effective in relieving breast engorgement. Recommendation: Planning and developing antenatal classes for newly breastfeeding mothers about prevention and management of breast engorgement.**

Keywords: **Breast engorgement, breast massage, postpartum women.**

1. INTRODUCTION

Breast engorgement is swelling of the breasts that result in painful tenderness and tenderness in the breasts. It's caused by increased blood flow and milk supply in the breast and it occurs in the first days after childbirth. **(McS., 2018).** Engorged breast can become extremely large, tight, lumpy, and tender. The veins on the surface of the breast may become more visible or even stick out. Breast engorgement occurs in the mammary glands due to expansion and pressure exerted by the synthesis and storage of breast milk. It is also a main factor in altering an infant's ability to latch on. Engorgement changes the shape and curvature of the nipple region by making the breast inflexible, flat, hard, and swollen. Nipples on engorged breast are flat or inverted. Sometimes it may lead to striae on nipples, mainly a preceding symptom of septal mastitis **(Lawrence, 2022).**

Failure to remove breast milk (especially in the first few days) after delivery when milk comes in and fills the breast and at the same time blood flow to the breasts increases causing congestion. Common causes of insufficient milk withdrawal are delayed initiation of breastfeeding, infrequent feeds, poor attachment, ineffective suckling, a sudden change in breastfeeding routine, sudden stopping breastfeeding, or if a baby suddenly starts breastfeeding less than usual **(Yadav et al., 2019)**.

Symptoms of breast engorgement differ from one woman to another. However, breasts that are engorged may feel hard or tight, tender or warm to touch, heavy or full, lumpy and swollen. Usually the whole of both breasts are affected and painful **(Noble & Carole, 2022)**. The woman may have a fever that usually subsides within 24 hours. The nipples may become stretched tight and flat which makes it difficult for the baby to attach and suck the milk. Milk does not flow well. Fever may occur as high as 15 percent, but is typically less than 39 degrees C and lasts less than one day **(Oliveira, 2022)**.

There are numerous methods for managing breast engorgement as warm application before breastfeeding, cool compresses, cabbage leaves, breast massage, acupuncture, and expressing milk.These methods can help in relieving engorgement symptoms and promote effective latch **(Zakarija & Stewart, 2020)**.

Significance of the study:

Breast massage help in alleviating engorgement and its associated symptoms as it lessens breast pain and congestion **(Eittah & Ashour, 2019)**. Also it improves the quality of breast milk, while increases milk pH and increases the baby's sucking response. In addition, it helps reduce the number of times mothers seek for clinics and reduces pressure on hospitals and caregivers **(Zagloul et al., 2020)**. So this study was done to evaluate the effect of breast massage on reduction of breast engorgement among postpartum women.

The aim of the study: This study aims to evaluate the effect of breast massage on reduction of breast engorgement among postpartum women.

Research hypothesis: There will be an improvement in breast engorgement among postpartum women after using of breast massage.

2. SUBJECTS AND METHODS

2.1. Study design: A quasi-experimental research design was used in this study.

2.2. Study sample: A sample of 50 women had engorged breast were purposively selected to be included in the study. Sample size was calculated using this formula **(Wassertheil-Smoller 2004):**

n = (Zα/2+Zβ)2 *2*σ2 / d2

n=sample size,

Zα/2 is the critical value of the normal distribution at α/2 (e.g. for a confidence level of 95%,

α is 0.05 and the critical value is 1.96),

Zβ is the critical value of the normal distribution at β (e.g. for a power of 80%, β is 0.2 and the critical value is 0.84)**,**

σ2 is the population variance (=100)**,**

 d is the difference would like to detect (=4)**.**

2.3. Study setting: The study was conducted at Suez Canal University Hospital and General Hospital in Ismailia, Egypt**.**

2.4. Tools of data collection:

2.4.1. Tool (1): An interview questionnaire:

It included three parts as part I; included personal data as age and occupation, part II; included obstetrical and gynecologic history as family planning methods used and part III; included signs and symptoms of breast engorgement.

2.4.2. Tool (2): Six-point engorgement scale:

Six-point engorgement scale was developed by **(Thomas et al., 2017)**. It is a standardized tool used to assess the level of breast engorgement with scoring ranges from 1 to 6.

2.4.3 Tool (3): Visual analogue rating scale:

Is developed by **(Kahl & Cleland, 2005)** and it is a numeric rating scale of the severity of the pain with score ranging from (0-3) the score zero (0) shows no pain and the top score (3) shows the worst possible pain.

2.4.4 Tool (4): Breast milk pH record:

It was used to assess milk Ph using digital pH meter. It was collected by the investigator in the clean & sterile plastic container, marked with mother's name, date and time of sample collected & stored in an ice box which will be brought to lab for checking pH with digital pH meter within two hours of collection.

2.4.5 Tool (5): Suckling speed of neonate record:

Suckling speed means the number of times a neonate suckles on the breast. It was checked by the investigator twice each for one minute during the first five minutes of starting breast feeding and taking the mean of them.

2.4.6 Tool (6): Latch Score record:

It is a standardized and documentation tool developed by **(Jensen et al., 1994)** to check for quality of breastfeeding process. The LATCH noted an area of proper breastfeeding assessment were "L" stands for how infant will attach onto the breast, "A" stands for the audible swallowing amount, "T" stands for type of nipple of the mother, "C" stands for mother's comfort level, "H" stands for how much help mother needs to hold infant to the breast. The investigator uses it for assessing both mother and infant variables.

2.4.7 Scoring system:

Scoring system of engorgement :

• Score 1: Normal

• Score 2 and 3: Mild engorgement

• Score 4 and 5: Moderate engorgement

 •Score 6: Severe engorgement.

Scoring system of pain:

No pain = (0) score

Mild pain score = (1) score

Moderate pain score = (2) score

Sever pain = (3) score.

Scoring system for latch:

Score 1-3 : poor breast feeding.

Score 4-6: fair breast feeding.

Score 7-10: good breast feeding.

2.4.8 Reliability of the Tool:

Reliability was done using cronbach's alpha test, the reliability of tool (1) that assessed the degree of engorgement was 0.948, **(Thomas et al., 2017),** the reliability of tool (3) that assessed severity of pain was 0.864 and reliability of tool (6) that assessed for quality of breast feeding was 0.801 indicating high reliability of the study tools. **(Jensen et al., 1994).**

2.5. Field work:

Data collection was conducted through three phases: Interviewing and assessment phase, implementation phase, and evaluation phase.

Interviewing and assessment phase :

In the study setting the investigator introduced herself to postpartum woman and detected if she willing to participate in the study according to inclusion and exclusion criteria. Written or oral consent was taken, and data were collected using the tools of data collection. All variables such as breast engorgement, breast pain, breast milk pH and the suckling speed of neonates were assessed and recorded in the recording sheet before intervention and it took about 10-15 minute for each tool. It took about 40-50 minutes for interview and assessment phase for each woman; the studied women were asked in a simple Arabic language and their answers were document in the tools used. The data collection takes about 10 months from December 2020 to September 2021.

Implementation phase:

During this phase the studied women were assured that no physical or emotional harm would occur during the study. The investigator instructed the women on the benefits of breast massage for the mother. A 10- to 15- minute breast massage intervention was performed for the women. This intervention was repeated at 2 hours intervals, in the morning from 10 am to 12 am for 2 consecutive days before breastfeeding .

Evaluation phase :

All the variables such as breast engorgement, breast pain, breast milk pH and the suckling speed of neonates were evaluated for different two times: three days after the intervention and five days after the intervention using the same tools.

2.6. Administrative design:

An official permission to collect data was obtained from Suez Canal university Hospital and General Hospital in Ismailia city. This was through submission of a formal letter from the Dean of Faculty of Nursing at Suez Canal University explaining the study aim and procedures and asking for permission to conduct it and collect data..

2.7. Ethical considerations:

Ethical approval was obtained from the Research Ethics Committee at the Faculty of Nursing – Suez Canal University. All ethical considerations were considered for privacy and confidentiality. Written consents were obtained from the women participating in the study after a brief explanation of the study aim and they were reassured that the information obtained would be private and used only for the purpose of the study with their right to withdraw at any time without any consequence. The subject of this study will not address religious, ethical, moral and culture issues among women.

2.8. Statistical design:

The collected data was coded, organized, categorized, computerized, tabulated, and analyzed using statistical package of the social sciences (SPSS) software program version 20.

3. RESULTS

Table (1): shows that the mean age of the studied sample was 23.86 ± 4.41 years, less than three quarters of the studied sample (70%) were living in rural areas, 40% of them had completed secondary education

Table (2): shows that all studied sample (100.0%) had swelling before intervention and all of them (100.0%) had no swelling, redness, warmness and an inverted nipple after 5 days of intervention with statistically significant differences between pre and post intervention (*P <0.05)*.

Table (3): shows that approximately two thirds of the studied sample (64.0% and 62.0%) had a moderate level of engorgement and severe pain before intervention respectively. After the intervention the majority (80.0% and 76.0%) had normal breasts and had no pain, respectively. There were statistically significant differences between pre and post intervention (P < 0.05).

Table (4): the majority of the studied sample (82.0%) had poor breast feeding before the intervention and all of them (100.0%) had a good breast feeding after 5 days of intervention with statistically significant difference between pre and intervention (P < 0.05).

4. DISCUSSION

It's normal to have some degree of breast engorgement during the first week or two after the birth. An increase in blood flow to breasts along with a surge in milk supply often results in breasts getting overly full. Engorgement that happens in this period is often the most intense a mother will experience. The majority of new mothers experience it to some degree range from mild to severe (**Wong et al., 2017).**

Multiple studies have reported that the world incidence is 2%-3% for mastitis and 65%-75% for breast engorgement with plugged ducts but in Egypt it was 82% **(El-hady et al., 2021).**

There are different methods for the treating of engorgement in breastfeeding mothers as warm and cold therapy, breast massage, expressing milk, and pain medications **(Wong et al., 2017).** Breasts massage helps in controlling the blood circulation and tissue fluid and is the easiest and cheapest method. So this study was done to evaluate the effect of breast massage on reduction of breast engorgement among postpartum women.

This study showed that the entire studied sample had signs of swelling and warmness, and most of them had redness, fatigue, headache and nipple fissure and a third had an inverted nipple. This come accordance with **McS, (2018),** who studied the traditional practices used by mothers in the east of Turkey to treat breast engorgement, and noted that majority them suffer from fullness/swelling/fever in their breasts, pain and fissures on nipples and inverted nipple problem.

The current study showed that, before the intervention, nearly two thirds of the studied sample had a moderate level of engorgement, while, after 3 days of the intervention the engorgement was mild and then became normal for the majority of them after five days of the intervention. The differences between pre and post intervention were statistically significant (P < 0.05).

This finding was in agreement with **Dehghani et al., (2018),** who assessed the effect of breast oketani-massage on the severity of breast engorgement among lactating postpartum women at the obstetrics clinic and gynecology department of Imam Reza Hospital, where they reported that level of engorgement was decreased to half in the studied women.

Also, **Krishnaveni, (2014),** who studied the effectiveness of breast massage on reduction of breast engorgement among mothers undergone caesarean section admitted in Balaji and Nallamuthusamy Hospital, and found that posttest level of engorgement was normal for majority of experimental group and mild for control group after application of breast massage.

This study found that before the intervention more than half of the studied sample experienced severe pain, and after 3 days of the intervention the majority of the studied sample had moderate to mild pain, and in half of them it disappeared after 5 days of the intervention. The differences between pre and post intervention were statistically significant (P < 0.05).

These results are consistent with **Thomas et al., (2017) and Cho et al., (2012),** where the found that pain score reduced to half the degree of pain was reduced by half after applying breast massage in the majority of the studied sample in their studies.

The current study found that mean suckling speed before intervention was 29.24±5.18 for massage group. This disagree with **Thomas et al., (2017),** found that The sucking speed of the neonates before the application of breast massage was 57.52 ±20.29 times/minute for massage group and 28 times/minute for the control group, with no significant difference between the two groups.

This study showed that mean suckling speed increased significantly to 38.7 times in massage group after 5 days of intervention. This agree with **Thomas et al., (2017)**, revealed that mean post-test score of suckling speed of neonate from day 1- 3 increased to 61.3 times per minute in both massage and control groups.

Regarding total latch score of breast feeding, this study noted that more than three quarter of the studied sample had poor breast feeding before intervention. This disagree with **Abbas & Hasan, (2015)** who assessed the LATCH score regarding breastfeeding among women after child birth, they reported that the highest percentages of the study sample had fair score of LATCH breastfeeding assessment. This study found that breast massage was effective in relieving engorgement symptoms.

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This was consistent with **(Dehghani et al. (2018),** who said that LATCH creates softness and elasticity for the breasts and nipples, which improves closure, thus increasing lactation and reducing engorgement.

Also, **Ngestiningrum et al., (2022)** who conducted a study to evaluate the effectivity of the oketani massage and the back massage combination towards breast milk production and to prevent breast engorgement, reported that the combination of the Oketani massage and back massage is effective in preventing breast engorgement as well as increasing breast milk production.

In addition, **Thomas et al., (2017),** revealed that breast massage was effective on relieving mild breast engorgement, breast pain as well as increasing the pH of breast milk and the suckling speed of neonate of the postnatal mothers. The previous result disagree with **Pustotina, (2016)** who founded that the pumping of breast milk is the most effective method to prevent breastfeeding problems in postnatal women.

5. CONCLUSION

Application of breast massage was effective in relieving breast engorgement, breast pain, increasing milk PH, suckling speed and total latch score .

6. RECOMMENDATIONS

Based upon the results of this study, the following recommendations can be suggested:-

1. Planning and developing prenatal classes for newly breast feeding mothers to improve their knowledge and develop their self-care practices regarding management of breast engorgement by using breast massage.

2. Nurses should be trained to use breast massage as the nursing approach for managing breast engorgement in their discharge teaching plan.

Table (1): Distribution of the studied sample according to their personal characteristics (n=50)

Personal data	No	%
Age 18-< 24 24- <29 29-35 Mean ± SD	16 25 9 23.86± 4.41	32.0 50.0 18.0
Residence -Rural -Urban	35 15	70.0 30.0
Educational level -Can't read and write -Read & write -Primary education -Preparatory education -Secondary education -University education & more	7 4 6 7 20 6	14.0 8.0 12.0 14.0 40.0 12.0
Occupation -House wife -Employee -Worker, trades/business	44 2 4	88.0 4.0 8.0

Table (2) Distribution of the studied sample according to their signs and symptoms of breast engorgement in different stages of the study (n=50)

Variables	Pre- intervention		Post 3 days of intervention		Post 5 days of intervention		□²	P value
	No	%	No	%	No	%		
Signs and symptoms of breast engorgement								
- Swelling	50	100.0	38	76.0	0	0.0	13.520	**0.000***
- Redness	32	64.0	5	10.0	0	0.0	32.0	**0.000***
- Warmness	50	100.0	31	62.0	1	2.0	3.920	**0.000***
- Fatigue	46	92.0	33	66.0	11	22.0	15.415	**0.001***
- Headache	45	90.0	22	44.0	11	22.0	19.697	**0.000***
- Nipple fissure	43	86.0	34	68.0	13	26.0	23.16	**0.000***
- Inverted nipple	15	30.0	0	0.0	0	0.0	8.01	**0.005***

*statistically significant at P < 0.05

Table (3) Distribution of the studied sample according to their level of breast engorgement and intensity of pain in the different stages of the study (n=50)

Variables	Pre- intervention		Post 3 days of intervention		Post 5 days of intervention		□²	P value
	No	%	No	%	No	%		
Level of breast engorgement								
- Normal								
- Mild engorgement	0	0.0	0	0.0	40	80.0	45.00	**0.000***
-Moderate engorgement	0	0.0	33	66.0	10	20.0		
- Severe engorgement	32	64.0	17	34.0	0	0.0		
	18	36.0	0	0.0	0	0.0		
Intensity of pain								
- No pain	0	0.0	4	8.0	38	76.0		
- Mild pain	0	0.0	21	42.0	12	24.0	0.625	**0.000***
- Moderate pain	19	38.0	25	50.0	0	0..0		
- Severe pain	31	62.0	0	0.0	0	0.0		
Mean ± SD	3.62±0.49		2.42±0.64		1.24± 0.43			

*statistically significant at P < 0.05

Table (4) Distribution of the studied sample according to the milk Ph, suckling speed and lactch score in the different stages of the study (n=50)

Variables	Pre- intervention		Post 3 days of intervention		Post 5 days of intervention		□²	P value
	No	%	No	%	No	%		
Milk PH								
- Alkaline	10	20.0	37	74.0	50	100.0	4.392	0.036
- Acidic	40	80.0	13	26.0	0	0.0		
Sulking speed								
Mean ± SD	29.24±5.18		32.44±4.94		38.70±14.84		t=0.767	0.445
Latch score								
- Poor breast feeding	41	82.0	0	0.0	0	0.0		
- Fair breast feeding	9	18.0	41	82.0	0	0.0	32.01	**0.000***
- Good breast feeding	0	0.0	9	18.0	50	100.0		

*statistically significant at P < 0.05

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