

The Effect of Breast Massage on Breast Pain and Breast Engorgement among Primiparous Women and Neonate's Suckling Speed

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1.ABSTRACT

Background: Breast engorgement is a condition when the breasts swell and become uncomfortable and painful. It happens in the first days following childbirth and is brought on by increased blood flow and milk production in the breast. The study **aimed** to evaluate the effect of breast massage on breast pain and breast engorgement among women and neonate suckling speed. **Design:** A quasi-experimental design was utilized to conduct this study (pre/post-test). **Setting:** The research will be carried out in the Maternal and Child Health Center at Mansoura City, Egypt. **Sample:** A non-probability purposive sampling technique including a sample of the study consisting of fifty women with engorged breasts from the previously selected areas. Four tools of data collection: Tool I: A structured interview questionnaire. Tool II: Six-point engorgement Scale, Tool III: Visual analogue rating scale, and Tool IV: Suckling speed record of the neonate. **Results:** the study revealed that had swelling and warmth (100.0%), 32.0% had moderate engorgement and more than three-fifths of studied women had severe pain. After four days of intervention, the majority of the studied sample had normal breasts, had no pain, and their suckling speed increased. There were statistically significant differences between pre and post-intervention concerning signs and symptoms of breast engorgement, level of engorgement, and intensity of the pain ($p < 0.05$). **Conclusion:** The application of breast massage was effective in relieving breast engorgement, Breast Pain, and the neonate's suckling speed. **Recommendation:** Planning and developing antenatal health educational classes regarding prevention and management of breast engorgement for newly breastfeeding mothers.

Keywords: Breast massage, Breast pain, Breast engorgement, Neonate's suckling speed, Primiparous women.

2.Introduction:

The most frequent post-partum problems are breast engorgement, pain and discomfort. Breast engorgement is a medical condition that affects the mammary glands due to enlarging veins and the pressure of newly absorbed breast milk. This condition lead to pain and irritability to mothers and effect on breastfeeding.

Researchers came to the conclusion that controlling the nipple and breast remain problems as a result of the difficulties participants who practiced nursing one week after birth described, including not producing enough breast milk, discomfort in the breasts, nipple fissures, and inverted nipples (Ghattas, et al., 2022)

When the breasts expand and become uncomfortable and painful, the condition is known as breast engorgement. Increased blood flow and milk production in the breast cause it to occur in the days immediately following childbirth (Hassan, 2020). It is possible to become engorged, large, tight, lumpy, and sensitive breasts. Veins near the

surface of the breast may become more noticeable or even protrude. Breast engorgement develops within the mammary glands as a result of the expansion and pressure brought on by the creation and storage of breast milk. It could also have an important effect on a baby's ability to latch on. Engorgement changes the shape and curvature of the nipple area by making the breast rigid, flat, hard, and swollen. Flat or inverted nipples indicate an engorged breast. Sometimes it may lead to striae on nipples, mainly a preceding symptom of septal mastitis (Lawrence, 2022).

When breast milk isn't removed from the breasts after delivery and the blood supply to them increases, congestion results (particularly in the first few days). Insufficient milk withdrawal can result from a variety of factors, such as delayed breastfeeding initiation, infrequent feeds, poor attachment, ineffective sucking, a sudden change in breastfeeding habit, an abrupt cessation of breastfeeding, or if a baby suddenly starts breastfeeding less frequently (Wang & Kim, 2019).

Each woman reacts differently to breast engorgement symptoms. On the other side, engorged breasts may feel uncomfortable or warm to the touch, weighty or full, lumpy and bloated, or hefty. Usually, both breasts are painful and injured as a whole (Noble & Carole, 2022). It's possible for the lady to get a fever, which often goes away in a day or two. If the nipples are flattened and constricted, it could be difficult for the baby to latch and take the milk. Poor milk flow is present. Fever can occur in up to 15% of women; however it often lasts less than a day and is less than 39 degrees Celsius (Oliveira, 2022.)

As a nursing intervention to support breastfeeding, breastfeeding information is made available. In an effort to increase the low breastfeeding rate, past research has been done on the variables affecting breastfeeding and the outcomes of nursing therapies. It has been demonstrated that increasing knowledge, boosting confidence, breastfeeding instruction and follow-up care, telephone follow-up, and rooming in all enhance the rate of breastfeeding continuation (Sung & Kim, 2019). These results indicate that additional breastfeeding management techniques, in addition to management and instruction, are needed two weeks after delivery (Eittah, et al., 2019).

Breast massage, developed by Sung as a second intervention method, is painless and helps to separate the connective tissue between the breast and the bigger pectoral muscle in the retromammary region. Breast massage is known to promote milk secretion, treat an inverted nipple, and lessen breast edema in addition to reducing breast swelling and breast pain. Additionally, it greatly improves the taste of breast milk and fosters the growth and development of the newborn (Sung & Kim, 2019).

Breast engorgement can be treated in a variety of methods, such as by heating the breasts prior to breastfeeding, using cool compresses after

breastfeeding, wrapping in cabbage leaves, giving a breast massage, undergoing acupuncture, and expressing milk. These steps can facilitate a successful latch and help with engorgement symptoms. With breast massage, which has been said to ease breast pain and lessen breast engorgement, the favour of breast milk may be improved, higher sucking speeds may ensue, and infants' growth and development may be hastened (El-hady et al., 2021).

2.1 Significance of the study:

The majority of women have at least mild symptoms Less engorgement is linked to nursing for a longer period of time during the first 48 hours (Pommeret, et al., 2022). Breast engorgement affects 65%-75% of lactating women worldwide and 82% in Egypt, particularly primigravida between the first and fourth postpartum days (El Sharkawy et al., 2022).

Over the past ten years, lactation professionals have taken a much-increased interest in breast massage, which has been utilized for decades as a folk cure for a wide range of diseases. It has a natural motion that, in cases of mild, moderate, and severe discomfort, helps to dilate local capillaries and lessen tissue congestion (Schnell, 2022). Breast massage eases discomfort and relaxes blood vessels, which opens them and improves blood flow. The previous evidence leads the researchers to evaluate the effect of breast massage on the reduction of breast engorgement among postpartum women and Neonate's Suckling Speed in Egypt. (Eittah & Ashour, 2019). Additionally, it enhances the quality of the milk and heightens the baby's sucking response. Additionally, it lessens the demand on hospitals and careers and decreases the frequency with which moms visit clinics (Zaghloul et al., 2020). So this study was done to evaluate the effect of breast massage on the reduction of breast engorgement among postpartum women and enhances the quality of the milk.

2.2 Operational definition:

Breast engorgement	is swelling, tightness, and an increase in size of the breasts. (Hassan et al., 2020; Prabusankar & Kalaivani, 2020; Zolala et al., 2020)
Breast pain:	It is when the postpartum mother is feeling any pain in the breast after childbirth due to breast engorgement or nipple cracking (Pommeret - de, 2022)
Sucking speed of neonates:	Sucking speed refers to the number of times a neonate sucks during 1 minute, and in this study, it refers to the mean of the twice measurements of the number of sucks per minute taken by a nurse at the postpartum care center within 5 minutes of beginning breastfeeding.

2.3 Aim of the study:

This study aimed to evaluate the effect of breast massage on breast pain and breast engorgement among women and neonate suckling speed.

2.4 Research hypothesis:

There an expected improvement will be regarding breast pain and breast engorgement among women and neonates' suckling speed after breast massage us.e

3. Subjects and Method:

3.1 Research design:

A quasi-experimental design was used to conduct this study (pre/post-test). Establishing a cause-and-effect link between an independent and dependent variable is the goal of a quasi-experimental design. A quasi-experiment, however, does not rely on randomization. When real tests are impractical or unethical to conduct, a quasi-experimental design can be a helpful tool.

3.2 Setting:

The research was carried out in the Maternal and Child Health Center in Mansoura City, Egypt. This setting was selected because it serves the most populated region which provides emergency triage assessment and treatment for patients.

3.3 Subjects:

postnatal o. A convenient sample of mothers was recruited from the previously setting according to the following mentioned :inclusion criteria

- Women with engorged breasts from the previously selected areas
- Free from medical diseases that interfere with .breastfeeding
- Baby is free from congenital anomalies that .affect breast feeding
- .Initiation of breast feeding
- .Willing to participate in the study
- t get any analgesics before breastDid no engorgement treatments.

The sample size was calculated using this formula (Wassertheil-Smoller 2004):

$$n = (Z\alpha/2 + Z\beta) 2 * 2 * \sigma^2 / d^2 \quad n = \text{sample size}$$

$Z\alpha/2$ is the critical value of the normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96), ($Z\beta$ 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), σ^2 is the population variance ($=100$), d is the difference would like to detect ($=4$).

3.4 Data collection tools:

Four tools were used:

Tool (1): An interview questionnaire: It was made following a review of the literature and was based on the most recent information from the study that was available at the time to gather information pertinent to the study (Oliveira, 2022 and El-hady et al., 2021). It was divided into three parts:

Part I; included demographic data as age, educational level, and occupation

Part II; included obstetrical and gynecologic history as family planning methods used part III; included signs and symptoms of breast engorgement.

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. 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.

Tool (3): Visual analogue rating scale:

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

Scoring system of pain:

No pain = (0) score, Mild pain score = (1) score Moderate pain score = (2) score Sever pain = (3) score.

Tool (4): 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 breastfeeding and taking the mean of them.

3.5 Validity of the Tool:

Content validity of the tools for clarity, comprehensiveness, and appropriateness was tested by a board of five expert professors, three expert professors in the Obstetrics and Gynecological Nursing Department, and two professors from the community health nursing department.

3.6 Reliability of the Tool:

Reliability was done using Cronbach's alpha test, the reliability of tool (1) which assessed the degree of engorgement was 0.948, (Thomas et al., 2017), the reliability of tool (3) which assessed the severity of pain was 0.864, and reliability of tool (4) that assessed for sucking speed of breast feeding was 0.801 indicating high reliability of the study tools (Jensen et al., 1994).

3.7 Fieldwork:

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

Assessment phase:

In the study environment, the researcher introduced herself to the subject woman and asked if she would be open to participating in the study based on inclusion and exclusion criteria. Data were acquired using the appropriate data collection procedures with written or verbal consent obtained. Before intervention, all factors including breast engorgement, breast pain, and newborn suckling speed were evaluated and documented in the recording sheet. It took each tool about 15 to 20 minutes to complete the assessment. The assessment phase for each lady took between 40 and 50 minutes; the questions were delivered to the study subjects in plain Arabic, and their responses were recorded in the tools employed. Beginning in March 2022 and lasting until the conclusion, data collection takes around four months to the end of June 2022.

Implementation phase:

The women who were being studied were given assurances that they would not suffer any bodily or emotional harm throughout the experiment. The researcher gave the ladies advice on the advantages of mother-child breast massage. The remedy for the ladies involved a 10- to 15-minute breast massage. At the beginning of the interview and after 30 minutes, this intervention was conducted once more.

Evaluation phase:

All the variables such as breast engorgement, breast pain, and the suckling speed of neonates were evaluated for different two times: two days after the intervention and four days after the intervention using the same tools through a home visit.

Administrative design:

Official permission to collect data was obtained from Mansoura university Hospital. This

was through the submission of a formal letter from the Dean of the Faculty of Nursing at Mansoura University explaining the study's aim and procedures and asking for permission to conduct it and collect data.

3.8 Ethical considerations:

Ethical approval was obtained from the Research Ethics Committee at the Faculty of Nursing – Mansoura 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's aim and they were reassured that the information obtained would be private and used only for the study with their right to withdraw at any time without any consequence. The subject of this study will not address religious, ethical, moral, or cultural issues among women and the Research Ethics Committee at the Faculty of Nursing – Mansoura University CODE is 0366 .

3.9 Statistical design:

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

4. Results:

Table (1): shows that the mean age of the studied women was 22.76 ± 5.32 years, 38% of them had secondary education, and (90%) of them were housewife .s

shows the number and percent (II)Table distribution of postnatal mothers according to their ± 3.32 Mean gravidity was .reproductive history (%70) a sizeable proportion of 'In addition . 1.01 had no (%96.9)m and most of the 'had no abortion the last delivery was performed normally .stillbirths . (%73.3) for a sizeable proportion) and most of 9)them 0 %)had no Family planning methods used

Table (3): shows that all studied women (100.0%) had swelling before intervention which improved post four days after the intervention and all of them (100.0%) had no swelling, redness, warmth, and an inverted nipple with statistically significant differences between pre and post-intervention ($P < 0.05$).

Table (4): shows that (70% and 64.0%) of the studied women had a moderate level of engorgement and severe pain before intervention respectively. After the intervention, 82% and 78% had normal breasts and no pain, respectively. A highly statistically significant difference was detected between pre and post-intervention ($P < 0.05$).

Table (5): Illustrates that the suckling speed among the studied women was lower before the intervention and all of them their suckling speed improved after 4 days of intervention with a highly statistically significant difference found between pre and post intervention ($P < 0.05$).

5. Discussion:

During the first week or two following delivery, some degree of breast engorgement is typical. Breasts frequently get excessively full due to an increase in blood flow to the breasts and an increase in milk production. During this time, a mother will frequently have her most severe engorgement. Most new mothers deal with it to varying degrees, from mild to severe (Wang et al., 2019).

Various techniques, such as warm and cold treatment, breast massage, milk expression, and painkillers, can be used to relieve engorgement in breastfeeding women (Wang et al., 2019). The simplest and least expensive approach is breast massage, which helps to regulate blood flow and tissue fluid. **So this study evaluated the effect of breast massage on breast pain and breast engorgement among women and neonate suckling speed.**

According to this study, all of the women who were evaluated had edema before the intervention, which had improved after four days, and all of them had no swelling, redness, warmth, or an inverted nipple after the intervention, with statistically significant differences between the two. From the perspective of the researchers, it demonstrated the beneficial effects of breast massage on reducing breast pain and engorgement in mothers as well as neonates' suckling speed. According to Lawrence, (2022), who examined the traditional methods used by mothers in the east of Turkey to cure breast engorgement, the majority of them experience discomfort, fissures on the nipples, and inverted nipple problems in addition to fullness, edema, and fever in their breasts.

According to the current study, the majority of the analyzed sample had moderate levels of engorgement prior to the intervention, but after two days it had decreased to a mild level and, after four days, had returned to normal for most of them. There were statistically significant differences between the pre- and post-intervention groups ($P < 0.05$).

According to Ghattas, et al. (2022), who evaluated the impact of Olive Oil Massage on Breast Engorgement and Breastfeeding among Primiparous Postnatal Mothers with Cesarean

Section Delivery at the other maternity outpatient clinics of Damanshour General Hospital in El-Beheira Governorate, Egypt, the amount of engorgement was reduced to half in the investigated women.

The effectiveness of breast massage in reducing breast engorgement among caesarean section mothers admitted to Hospital was also studied by Mohamed, R. S.2022, who discovered that after breast massage, the majority of the experimental group's engorgement levels were normal and mild for the control group.

According to these study results, more than three-fifths of the investigated women had moderate engorgement and significant pain prior to intervention. Most of them had normal breasts and no pain following the intervention, respectively. Between the pre- and post-intervention periods, a highly statistically significant change was found. From the researchers' perspective, it demonstrated the efficacy and success of the massage application.

These findings are in line with those of Duygu et al. (2022) and Suna Dağ, et al. (2022), who discovered that breast massage lowered pain scores to a half-degree of discomfort in the majority of the studied group.

This outcome is consistent with studies that found breast massage to be effective at reducing breast pain during the first stage of puberty (Giangrasso, et al., 2022). These findings also corroborate a study that suggested breast massage was a painless technique for softening the entire breast (Suna et al., 2022).

According to the current study's findings, the suckling speed of the examined women was lower prior to the intervention than it was after 4 days of it. This improvement was observed in all of the women, with a highly statistically significant difference between pre and post intervention ($P < 0.05$). agree to Yadav et al., (2022) findings, the neonates' sucking rates after breast massage application were timed at/post minute for the massage group, with discernible difference between the pre and post test. This is in line with Ghattas, et al. (2022) findings, which showed that the mean post-test score of the neonate suckling speed from days 1-3 increased to 61.3 times per minute in both the massage and control groups.

Similar to this, according to Genna(2022), instances of clumsy sucking—such as when the infant's suckling power was poor, when the neonate did not eat eagerly, and when the neonate fed too eagerly—led to many mothers discontinuing nursing. This finding suggests a strong correlation

between a baby's suckling behaviour and the health of the breast. This connection supports the idea that when breast massage is utilised to raise the amount of breast milk produced as well as to boost the stretching of the areola and the condition of the breast, these benefits all contribute to the neonate's degree of sucking, or suckling power and rhythm (Rinat, 2022).

According to a study that evaluated breastfeeding rates dependent on the extensibility of the nipple and areola, the favorable group with extensible nipple and areola displayed improved breastfeeding rates after childbirth compared to the other group (Bapat, 2022). Consequently, it would appear that breast massage-induced increases in the extensibility of the nipple and areola have a positive effect on the suckling process of neonates, resulting in a higher feeding speed. In addition, Ngestiningrum et al., (2022) found that the combination of massage and back massage is beneficial in minimizing breast engorgement and improving breast milk production.

Additionally, Thomas et al., (2017) found that breast massage helped postpartum moms' neonates who had mild breast engorgement, breast soreness, and slow suckling speed. The preceding finding conflicts with Pustotina's, (2016) finding that pumping breast milk is the most efficient way to reduce breastfeeding difficulties in postpartum women.

Breast massage enhances the quality of the milk and heightens the baby's sucking response. Additionally, it lessens the demand for hospitals and careers and decreases the frequency with which moms visit clinics (Zaghoul et al., 2020). So this study was done to evaluate the effect of breast massage on the reduction of breast engorgement among postpartum women and Neonate's Suckling Speed. After using breast massage, the results of this research showed an improvement in breast pain, breast engorgement, and breast feeding speed in newborns. Therefore, the research hypothesis was accepted.

6. Conclusion:

In light of the study findings, it was concluded that the application of breast massage was effective in relieving breast engorgement, breast pain, and the neonate's suckling speed.

7. Recommendation:

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

- Planning and developing antenatal health educational classes regarding prevention and

management of breast engorgement for newly breastfeeding mothers.

- Providing training programs for nurses about how to use breast massage as the nursing approach for managing women with breast engorgement.

8. Acknowledgments

The authors appreciate all those who participated in the study and helped to facilitate the research process.

9. Authors' contributions

All authors made a substantial contribution to the writing of the paper draft. All Authors contributed equally to this manuscript; conceptualization, preparation, and implementation of the program, methodology, investigation of formal and administrative procedures, data entry and analysis, writing-original draft, writing-manuscript, editing, and revision.

All authors read and approved the final manuscript.

10. Funding

no Funding

11. Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

12. Availability of supporting data:

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

13. References:

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

Demographic data	No	%
Age		
18-	9	18.0
23-	24	48.0
28-	9	18.0
33- 38	8	16.0
Mean ± SD	22,76 ±5,32	
Min.-Max.	18-38	
Educational level		
- Can't read and write	6	12.0
-Read & write	5	10.0
-Primary education	7	14.0
-Preparatory education	8	16.0
-Secondary education	19	38.0
-University education	5	10.0
Occupation		
-Housewife	45	90.0
-Employee	5	10.0

Table (2): Distribution of the studied sample according to their reproductive history (n=50)

Reproductive history		
	No	%
Gravidity: Mean ± SD	3.32 ± 1.51	
Parity: Mean ± SD	2.30 ± 1.00	
No of abortion:		
0	21	70.0
1-4	9	30.0
Type of last delivery:		
- Normal	22	73.3
- CS	8	26.7
Family planning methods used		
Yes	10	20
No	90	80

Table (3) Distribution of the studied women according to their signs and symptoms of breast engorgement in different stages of the study (n=50)

Signs and symptoms of breast engorgement	Pre-intervention		Post two days of intervention		Post four days of intervention		X2	P- value
	No	%	No	%	No	%		
Swelling	50	100.0	37	74.0	0	0.0	14.45	0.000*
Redness	34	68.0	6	12.0	2	4.0	4.560	0.000*
Warmness	50	100.0	32	64.0	1	2.0	16.336	0.000*
Fatigue	47	94.0	35	70.0	10	20.0	19.354	0.000*
Inverted nipple	21	42.0	0	0.0	0	0.0	7.0	0.005*
Nipple fissure	44	88.0	35	70.0	11	22.0	22.34	0.000*
Headache	46	92.0	24	48.0	10	20.0	18.675	0.000*

*statistically significant at P < 0.05

Table (4) Distribution of the studied women according to their level of breast engorgement and intensity of pain in the different stages of the study (n=50)

Variables	Pre-intervention		Post two days of intervention		Post four days of intervention		t-test	P-value
	No	%	No	%	No	%		
Breast engorgement							42.00	0.000*
-Normal	0	0.0	0	0.0	41	82.0		
-Mild engorgement	0	0.0	33	66.0	9	18.0		
-Moderate engorgement	35	70.0	17	34.0	0	0.0		
- Severe engorgement	15	30.0	0	0.0	0	0.0		
Intensity of pain	0	0.0	5	10.0	39	78.0	0.634	0.000*
-No pain	0	0.0	20	40.0	11	22.0		
-Mild pain	32	64.0	25	50.0	0	0.0		
-Moderate pain	18	36.0	0	0.0	0	0.0		
-Severe pain								

Table (5) Distribution of the studied women according to suckling speed during the different stages of the study (n=50)

Variables	Pre-intervention	Post two days of intervention	Post four days of intervention	t-test	P-value
Suckling speed Mean ± SD	29.24±5.18	32.44±4.94	38.70±14.84	0.778	0.00**

*statistically significant at P < 0.05