Effectiveness of breast massage technique on pain and breast milk volume among postnatal mothers with breast engorgement in selected hospitals

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ABSTRACT

Breast engorgement occurs in 72% to 85% of post-natal mothers. Six out of ten mothers suffer from it leading to decreased milk production (**Chaudhary et al., 2019**) [1].Simple lifestyle modifications in diet and breastfeeding routine relieves engorgement to some extent and enhances breastfeeding experience. Present study was conducted to determine breast pain and volume of breast milk pre and post intervention among postnatal mothers and to perceive association of breast massage technique with selected demographic variables along with its effectiveness. 30 postnatal mothers were selected by pre- test and post -test design through non probability purposive sampling method. Breast massage Checklist and Wong - Baker pain rating scale along with measuring cup for breast milk volume were used. Breast massage was done thrice a day for 3 days and breast milk volume and pain score was noted. The pre- test and post-test comparison for pain was significant ($t=1$; $p \leq 0.05$). The pre-test comparison for breast milk volume with post-test was significant ($t=8.408$; $p \leq 0.05$). No significant association found between post-test level of breast engorgement with demographic variables. Thus, Breast massage technique was effective ($t=7.942$; $p \leq 0.05$) i.e., thereby concluding that breast massage in routine was effective in lessening engorgement.

Keywords- Breast massage, pain, breast milk volume, postnatal mothers, breast engorgement

Background of the study

Postnatal mothers sometimes face breastfeeding problems such as breast engorgement and nipple pain due to excessive milk production, outflow obstruction or poor removal of milk by the baby which sometimes lead to early weaning if not corrected (Princy Thomas et al , 2017).[2]Breast **engorgement problem was common in early days and also after weeks of breast feeding. This frequent problem can happen to lactating mother who don't or can't breast feed as well as those who do. It is usually caused by an imbalance between milk supply and infant demand, if engorgement left untreated it can lead to potentially serious issues including painful blebs, plugged milk ducts or mastitis**[3].

Need of the study-Breast engorgement occurs in 72% to 85% of post-natal mothers. Six out of ten mothers suffer from it leading to decreased milk production (Chaudhary et al., 2019)[1]. The incidence rate of breast engorgement all over the world is 1:8000 and in India its 1:6500 (Ahmed Abdallah N.M et.al.,2018)[4].In India within an hour of birth 96% of newborns are breast fed of that urban population is 29% and rural population is 21 % (Resmy et al., 2014)[5]. In India 4.9% of postnatal women face breast engorgement, flat or inverted nipple or mastitis (Iyengar, 2012)[6]. A descriptive study was conducted to identify the concerns of breastfeeding mothers during the first 20 weeks postpartum. The study concluded that proportion of mothers expressing concerns decreased over time, but some concerns such as breast engorgement & nipple tenderness persisted over the 20 weeks. Engorgement is a well-known but poorly researched aspect. (Lowdermilk 2007)[7].

The researchers observed the mother's concern about breast engorgement and less milk production during clinical posting. Simple lifestyle modifications in diet and breastfeeding routine relieves engorgement to some extent and enhances breastfeeding experience. Therefore the researchers were interested in study to evaluate the effectiveness of breast massage on reduction of breast engorgement among mothers admitted in selected hospitals of Indore district.

Literature Review

Nisha Yadav et.al. 2022 conducted a quasi-experiment posttest-only control group research design was used and the setting of the study was antenatal OPD and postnatal ward at a teaching institution. A sample of 60 primigravidae in the age group of 18–35 years with gestational age ≥ 36 weeks were selected by consecutive sampling technique. The experimental group received two lactation counseling sessions of 30 min each 1 week apart (in person/ video call), whereas control group received routine care. Breastfeeding practices, breast engorgement, and newborn feeding behavior were assessed on the 3rd postnatal day using

breastfeeding practices checklist, breast engorgement scale, and newborn feeding behavior assessment tool, respectively. There was significant improvement in breastfeeding practices (t = 7.18, *P* = 0.00), breast engorgement (t = 2.41, *P* = 0.01), and newborn feeding behavior (t = 5.24, *P* = 0.00) in the experimental group, which proves that the prenatal lactation counseling was effective in improving breastfeeding practices, newborn feeding behavior, and reducing breast engorgement.[8]

Problem Statement: A quasi experimental **study to determine effectiveness of breast massage technique on pain and breast milk volume among postnatal mothers with breast engorgement in selected hospitals of Indore M.P**

Objectives:

1. To determine the breast engorgement pre and post breast massage technique
2. To determine the pain pre and post intervention related to breast engorgement among postnatal mothers.
3. To assess the volume of breast milk pre and post intervention among postnatal mothers.
4. To observe the practice concerning to breast massage technique among postnatal mothers with breast engorgement.
5. To find out the association of breast massage technique with selected socio demographic variables.
6. To find out the effectiveness of breast massage technique in relation to breast engorgement among postnatal mothers.
7. Hypotheses: All hypotheses are tested at the level of $p \leq 0.05$ significance
8. HO1– There is no significant effect of breast massage on pain after breast massage among postnatal mothers
9. HO2- There is no significant effect of breast massage on volume after breast massage among postnatal mothers.
10. HO3- There is no significant association of breast massage technique with selected socio demographic variables.
11. H1- There is significant effect of breast massage on breast engorgement level after breast massage among postnatal mothers.
12. H2- There is significant effect of breast massage on pain after breast massage among postnatal mothers.
13. H3- There is significant effect of breast massage on volume after breast massage among postnatal mothers.
14. H4- There is significant association of breast massage technique with selected socio demographic variables.
15. H5- There is significant difference between mean pre and post intervention of breast massage related to breast engorgement among postnatal mothers.

Research Methodology

Research Approach- Quantitative research approach

Research Design- Quasi experimental one group pre-test and post -test design

Variables:**Dependent variable:**

1.Breast engorgement
2.Pain score
3.Volume of breast milk

Independent variable: Breast massage

Setting- Post-natal wards of selected hospitals of Indore.

Study Population- Mothers who had undergone Normal Vaginal Delivery and Lower Segment **Cesarean Section.**

Sampling Technique- Non Probability sampling was used.

Sample Size- 30 Postnatal Mothers

Sample Selection Criteria

Inclusion Criteria:

- Postnatal mothers who were present at the time of data collection.
- Postnatal mothers who had normal vaginal and LSCS delivery mode in selected hospitals of Indore.
- Postnatal mothers with breast engorgement who had minimum 4 days of selected hospital stay.
- Postnatal mothers who were willing to do breast massage 2-3 times a day for minimum 3 days.

Exclusion Criteria:

- Those not willing to participate.
- High – risk New-born.
- Those with other breast issues

Development and Description of theTool:

Section A: Socio-Demographic Variables- Mother's Age, Educational Status, occupation, **Gravida, Postpartum Day, Mode of delivery, Feeding starting time after delivery, Breast feeding Duration and Feeding Frequency.**

Section B: Six - Point Engorgement Scale -The scale was devised by Hill and Humenick (Pamela. D. Hill and Sharron .S. Humenick) in 1994. This is a standardized range utilized to evaluate the severity of breast engorgement. The scoring has been mentioned as below:-

S.NO	SCORES	INTERPRETATION
1.	1	Normal
2.	2 and 3	Mild Engorgement
3.	4 and 5	Moderate Engorgement
4.	6	Severe Engorgement

Section C : Wong Baker Pain Rating Scale- The pain rating scale helps to locate the level of pain the participants is having .The pain scale 0 (no pain) to 10 (worst pain).

S. No	Scores	Interpretation
1.	0	No Pain
2.	1 - 3	Mild Pain
3.	4 - 6	Moderate Pain
4.	7 - 10	Severe Pain

Section D: Breast Milk Volume: - Assessed with the help of Measuring Cup

SectionE: BreastMassage Checklist- It is the modified checklist which involves techniques for breast massage for relieving out symptoms of breast engorgement as well as to increase the volume of breast milk among postnatal mothers.

S. No	Scores	Interpretation
1.	1 - 4	Poor Practice
2.	5 - 8	Moderate
3.	9 - 12	Good Practice

Data Collection Procedure:

The steps for data collection on respective day is as follows: -

Day 1 Introduction, consent.

Researchers introduced themselves and explained the objectives. Written consent was taken prior to data collection. Demographic data, pain scale, and standardized measuring cup to assess the Breast milk volume and pain prior to the procedure done. Breast massage procedure was then demonstrated.Return demonstration was assessed. The procedure was then done for three times in a day and after each massage, breast milk expression amount and pain score was noted.

Day 2 – 4

Breast massage was done for three times in a day and after the massage, breast milk expression amount and pain scorewas noted by both researcher and the mother. TheData compilation and analysis was done after data collection.

Ethical Considerations

The permission was attained to carry out the research study from research committee of the college.Permission was acquired from the selected hospitals of Indore.Informed consent was obtained from the mother.Anonymity was consequently maintained.

Reliability- Pre testing and tool reliability were carried out among 6 Postnatal mothers with breast engorgement at St. Francis Hospital and Research Centre, Indore. The reliability for breast massage technique checklist was found to be .768 by test-retest method.The reliability coefficient for Wong Baker Pain Rating scale was found as 0.69 which was indicated to be reliable.

Validity: The research study was approved by the ethical committee and tools were validated by experienced personnels from the nursing profession.

Pilot and Main Study Data Collection- The pilot and Main study was carried for a period of 2 months.The purpose of the study was explained to the subjects. Confidentiality was assured to all the respondents. 6 Samples for pilot study and 30 samples for main study were selected by using non-probability purposive sampling technique. An informed consent was obtained. Data related to demographic variables was collected by the Interview method. Pre and Post intervention pain and volume was assessed using tools. After the Pre intervention, Breast massage was taught to the mothers through demonstration. The practice of Breast massage was observed using a checklist. Volume of Breast milk and pain during Breast massage were assessed after the intervention using standardized measuring cup and Wong Baker pain rating scale. Based on the information, data analysis was done using descriptive and inferential statistics.

Findings and Discussion

Section I: Socio-demographic variables

Findings revealed that majority of postnatal mothers **(53%)** were in age group of 20- 24 years. Out of 30 postnatal mothers, majority of them were primary school educated **(53.3%)** with 96.6 % of selected Postnatal mothers with breast engorgement were housewife. Most of them were Primi Mothers **(90%)** with 2nd Postpartum Day **(96.6%)**. Majority of them had normal vaginal mode delivery **(63.3%)** in comparison with the caesarean section. The Breast-Feeding duration as assessed by researchers among postnatal mothers through interview were 15 minutes after delivery (**60%**) and **60%** postnatal mothers stated that the gap for breast feeding the baby is frequently more than an hour.

Section II:Assessment of Pre and posttest breast

engorgement level score among postnatal mothers

N=30

Breast Engorgement level	Frequency	Percentage	Mean Score	SD
Normal	0	0	16.25	**24.5**
Mild Engorgement	21	70		
Moderate Engorgement	9	30		
Severe Engorgement	0	0		

Table no 2 Assessment of Pre-test breast engorgement level score among postnatal mothers.

The table 2 represent frequency, percentage, mean score and standard distribution of pre-test breast engorgement level among postnatal mothers. With regards to the level of breast engorgement in pretest out of 30 postnatal mothers, none of them were normal, 21 (70%) showed mild level of breast Engorgement and 30% showed moderate breast engorgement. The mean score was 16.25 with standard deviation of 24.5. It shows that the breast massage is essential to reduce the level of breast engorgement.

Post-test score of breast engorgement level among postnatal mothers N=30

Breast Engorgement level	Frequency	Percentage	Mean Score	SD
Normal	19	63.3%	7.5	7.08
Mild Engorgement	7	23.3%		
Moderate Engorgement	4	13.3%		
Severe Engorgement	0	0%		

Table 3Assessment of Post-test breast engorgement level score among postnatal mothers.

Table no 3 shows post test level of breast engorgement among postnatal mothers after giving breast massage which were classified into Normal, Mild Engorgement, Moderate Engorgement, Severe Engorgement. With regards to the level of breast engorgement in pretest out of 30 postnatal mothers, 19 (63.3%) of them were normal, 7 (23.3%) showed mild level of breast Engorgement and 13.3% showed moderate breast engorgement. Mean post test score among postnatal mothers was 7.5 with standard deviation of 7.08. It shows the data of breast engorgement among postnatal mothers after breast massage was highly effective.

Section 3- Distribution of comparison of mean score of pre-test and post-test breast engorgement level

Test	Mean	SD	Mean Difference	Paired t-test value
Pre-Test	16.25	24.5	8.75	1.86 P value- .033 **S** at p<.05
Post-Test	7.5	7.08		

among postnatal mothers with breast engorgement p> 0.05, Not Significant, p< 0.05 Significant, p< 0.001 Highly significant

Table- 4 Showing comparison of mean pre and post-test breast engorgement -The data presented in table above shows thatin pre- test breast engorgement level mean was 16.25 with standard deviation of 24.5, among postnatal mothers. Whereas in the post test they were having mean 7.5 with standard deviation of 7.08, so difference is 8.75. The paired "t" test value is 1.86 with p value of .33 which is found to be significant at p<0.05 level.

Thus hypothesis H_1 is accepted.-The above findings are supported by the pre-experimental study conducted by Princy Thomas et.al. 2017 in postnatal ward of Hakeem Abdul Hameed Centenary Hospital, Jamia Hamdard, New Delhi. The findings revealed that there was significant difference between pre-test score and post-test score from day 1- 3 which was found to be statistically significant as evident for numerical pain rating scale 't' value 19.7 at 0.05 level of significance.[2]

Section 4Distribution of Pain pre and post breast massage related to breast engorgement among postnatal mothers using Wong Baker rating scale **N=30**

Pre-test pain assessment prior breast massage				
Pain rating scale	**Frequency**	**Percentage**	**Mean Score**	**SD**
No pain	0	0	7.5	8.015
Mild Pain	19	63.3		
Moderate pain	11	36.6		
Severe pain	0	0		

Table no 5 Assessment of Pre-test pain level score prior to breast massage among postnatal mothers.

The table 5 represent frequency, percentage, mean score and standard distribution of pre-test pain level among post-natal mothers which is classified into no pain, mild pain, moderate pain and severe pain. With regards to the level of pain in pretest out of 30 postnatal mothers, none of them mentioned about severe pain, 11 (36.6%) showed moderate level of pain and 63.3% showed mild breast engorgement. The mean score was 7.5 with standard deviation of 8.015. It shows the figure of pain among postnatal mothers grading from mild to moderate, so breast massage is essential to reduce the level of pain. **N=30**

Posttest pain assessment prior breast massage				
Pain rating scale	**Frequency**	**Percentage**	**Mean Score**	**SD**
No pain	15	50%	7.5	5.590
Mild Pain	10	33.3%		
Moderate pain	5	16.6%		
Severe pain	0	0%		

Table no 6 Assessment of Posttest pain level score prior to breast massage among postnatal mothers.

The table 6 represent frequency, percentage, mean score and standard distribution of posttest pain level among post-natal mothers which is classified into no pain, mild pain, moderate pain and severe pain. With regards to the level of pain in pretest out of 30 postnatal mothers, none of them mentioned about severe pain, 5 (16.6%) showed moderate level of pain and 10 (33.3%) showed mild breast engorgement and 15 (50%) showed no pain. The mean score was 7.5 with standard deviation of 5.590. It shows the figure of pain among postnatal mothers grading from normal to moderate post breast massage.

Section 5:-Distribution of Pre and Post volume comparison of breast milk related to breast massage technique among postnatal mothers with breast engorgement N=30

Volume Comparison	**Mean**	**SD**	**T test**	**p**
Pretest	12.60	4.955	8.408	0.0001 **S**
Post test	24.60	6.04		

p> 0.05, Not Significant, p< 0.05 Significant, p< 0.001 Highly significant

Table no 7 Volume level score before and after breast massage among postnatal mothers

A measuring cup was used to measure the breast milk in millilitres. The researcher demonstrated the procedure on second day after delivery and then analysed the mothers procedure steps with the help of checklist. The Average Milk production was found to be increased on 2nd, 3rd, 4th day of the post breast massage procedure, respectively at a particular time. The pretest mean was 12.60 with standard deviation of 4.955.

The posttest mean was 24.60 with standard deviation of 6.04. The t test was applied and was found to be 8.408. It was found to be significant at $p \leq 0.05$.

Thus hypothesis H_3 is accepted

The above finding was supported by the findings of Arslanoglu S et.al. 2013 in his quantitative study in which breast milk volume before breast massage was 7.33 ml and the volume of breast milk in the post test was 15.56 ml, the results of this study indicate that breast massage is effective in increasing the volume of breast milk. [9]

Section 6:-Association of posttest of postnatal mothers with selected demographic variablethe chi square was used to find out the association of posttest level of breast engorgement among postnatal mothers with their selected demographic variables. The study findings showed that there was no significant association of posttest level of breast engorgement among postnatal mothers with their selected demographic variables like age, educational status, occupation, postnatal day, gravida, feeding started, duration of feeding, feeding frequency. **Hence the hypothesis H_4 was rejected at $P \leq 0.05$**

The above findings can be supported by quasi experimental study done by Cherian Shilpa 2019 among sixty postnatal mothers whose babies were admitted to the NICU **were selected using non-probability purposive sampling technique. The result of the study showed that the "t" value was 2.01. Association of demographic variables with the volume of expressed breast milk showed no significant association at 0.05 level of significance.** [10]

Section 7:Effectiveness of breast massage technique in relation to breast engorgement among postnatal mothers. N=30

EffectivenessComparison	Mean	SD	T test	p
Pretest	3.76	1.453	7.942	0.0001 S
Post test	7.53	2.156		

p> 0.05, Not Significant, p< 0.05 Significant, p< 0.001 Highly significant

Table- 8Effectiveness of breast massage technique among postnatal mothers-Breast massage includes rubbing, stroking and kneading each breast followed by massaging breast with finger pads, in a circular motion around the whole breast in a clockwise manner. To ensure the correct method practiced by the mother, the first expression after the teaching is evaluated by the researcher with the help of a checklist.

The pretest mean was 3.76 with standard deviation of 1.453. The posttest mean was 7.53 with standard deviation of 2.156. The t test was applied and was found to be 7.942. It was found to be significant at $p \leq 0.05$.

Thus hypothesis H_5 is accepted The above findings were supported byquasi-experimental study conducted by Priyanka Sonsale et.al. 2014 to evaluate the effectiveness of olive oil massage on prevention of breast engorgement among 40 postnatal mother's admitted in selected hospital of Maharashtra by non-randomized sampling technique. After pre-test, intervention was given as olive oil massage for 5 min up to 3 consecutive days. Then finally the post-test assessment was done. Paired 't' test was used for data analysis. The study concluded that the olive oil massage is effective to prevent breast engorgement.[11]

Conclusion-The current study was done to assess the effectiveness of breast massage on lessening of breast engorgement among mothers. The consequences of the study concluded that breast massage was effective on lessening of breast engorgement among mothers. Breast massage is easy to exercise,not painful and can augment comfort to mother in the puerperium period, henceforth it could effortlessly be implemented as a routine intervention. Therefore, the investigators concluded that further importance should be given to assessment on reduction of level of breast engorgement by using standard breast engorgement scale following the intervention of breast massage. It can be given as non-pharmacological measures to reduce breast engorgement. Acknowledgement: We would like to express our sincerest gratitude to our Director for being the backbone of our institute. We are thankful to PC Sethi and St. Francis Hospital for granting us permission to conduct our research study. We owe our sincere gratitude to our samples for their cooperation in successful completion of our research.

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