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Quasi-Experimental Study to Assess the Effectiveness of Reverse Pressure Softening Technique on Level of Breast Engorgement Among Postnatal Mothers in Selected Hospitals of Metropolitan City.

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KEYWORDS:

Breast engorgement, Reverse Pressure Softening, Postnatal mothers, Breastfeeding, Non-pharmacological intervention.

ABSTRACT:

Introduction : Breastfeeding is universally acknowledged as the most effective means to promote infant health and survival; however, many mothers face challenges such as breast engorgement, which can hinder successful breastfeeding. Breast engorgement, characterized by breast swelling, pain, and tenderness due to milk accumulation, affects a large proportion of postnatal women and can lead to complications like mastitis, nipple trauma, and premature cessation of breastfeeding. The present study aimed to assess the effectiveness of the Reverse Pressure Softening (RPS) technique in reducing breast engorgement among postnatal mothers in selected hospitals of a metropolitan city.

Aim: To assess the effectiveness of the Reverse Pressure Softening technique on the level of breast engorgement among postnatal mothers in selected hospitals of a metropolitan city.

Methodology: A quantitative research approach with a quasi-experimental two-group pre-test post-test design was adopted. The study included 80 postnatal mothers (40 in the experimental group and 40 in the control group), selected through non-probability purposive sampling. Data were collected using a structured questionnaire and the Six-Point Breast Engorgement Scale. The experimental group received RPS for 10 minutes twice daily for three consecutive days, while the control group received routine postnatal care. Data were analyzed using descriptive and inferential statistics, including paired t-tests and two- sample z-tests.

Results: Findings revealed a marked reduction in breast engorgement scores in the experimental group compared to the control group. The mean engorgement score in the experimental group decreased substantially by Day 3 evening, while the control group showed minimal improvement. Statistical analysis demonstrated significant differences ($p < 0.05$) from Day 1 evening onwards, confirming the effectiveness of RPS in relieving breast engorgement.

Conclusion: The study concluded that the Reverse Pressure Softening technique is a safe, simple, and effective non-pharmacological method to alleviate breast engorgement, enhance maternal comfort, and promote successful breastfeeding. It can be integrated into routine postnatal care to improve breastfeeding outcomes and maternal well-being.

INTRODUCTION

“Breastfeeding is a mother’s gift to herself, her baby, and the earth.” – Pamela K. Wiggins.

Breastfeeding is widely recognized as the most effective means to ensure infant health, growth, and survival. Breast milk provides all essential nutrients for the first six months of life, supports immunity, and contributes to long-term cognitive and physical development. Despite global recommendations by the World Health Organization (WHO) for exclusive breastfeeding during the first six months, many infants are not exclusively breastfed due to maternal challenges, including breast engorgement. Other barriers such as maternal fatigue, lack of proper guidance, psychological stress, and inadequate support from family or healthcare professionals may further complicate breastfeeding practices.

Breast engorgement is one of the most common and distressing postpartum complications. It occurs due to overfilling of the mammary glands, vascular

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congestion, and accumulation of interstitial fluid, leading to painful, swollen, and tender breasts. This condition often causes difficulty in latching, reduced milk transfer, and frustration for both mother and infant. Severe engorgement may result in mastitis, plugged ducts, nipple trauma, or infection, potentially leading to early cessation of breastfeeding. Engorgement typically manifests between the third and fifth day postpartum, coinciding with the transition from colostrum to mature milk, and affects nearly two-thirds of lactating women. Contributing factors include primiparity, cesarean section, premenstrual breast tenderness, use of intravenous fluids during labor, and insufficient breastfeeding or pumping frequency.

Reverse Pressure Softening (RPS) is a non-pharmacological intervention designed to alleviate breast engorgement and facilitate successful breastfeeding. The technique involves gentle manual manipulation of the areola and nipple to soften the sub-areolar tissue, temporarily displacing excess fluid into deeper breast ducts. This promotes nipple protrusion, eases infant latching, stimulates the milk ejection reflex, and enhances milk transfer. RPS is safe, simple, and cost-effective, making it suitable for early postpartum implementation, particularly during the first two weeks when engorgement is most severe.

The significance of RPS lies not only in reducing maternal discomfort but also in promoting optimal infant nutrition, preventing breastfeeding complications, and enhancing maternal confidence. Early intervention with RPS can minimize the risk of nipple trauma, blocked ducts, and decreased milk supply. Given the high prevalence of breast engorgement and its negative impact on breastfeeding outcomes, implementing timely, evidence-based, non-invasive strategies such as RPS is crucial for both maternal and infant health. It empowers mothers to maintain effective breastfeeding practices while ensuring adequate nutrition and growth for their newborns.

NEED OF THE STUDY

Breast engorgement is a significant postpartum challenge affecting lactating mothers worldwide, resulting in pain, discomfort, and impaired breastfeeding. Studies indicate that the prevalence of breast engorgement among postpartum women ranges from 65% to 75%, with a risk of complications such as blocked milk ducts, mastitis, and nipple trauma. These complications can lead to inadequate milk transfer, poor infant nutrition, and early cessation of breastfeeding. Research also highlights that lactational counseling, education, and non- pharmacological interventions significantly reduce engorgement and improve breastfeeding outcomes. Techniques such as reverse pressure softening (RPS) are designed to soften the areola, improve nipple protrusion, facilitate effective latching, and stimulate milk flow. Early intervention with RPS in the first two weeks postpartum can prevent severe engorgement, reduce pain, and support continuous breastfeeding.

During clinical observations in postnatal wards, it was noted that many mothers experience difficulties in breastfeeding due to engorgement, leading to improper latching and insufficient milk supply to the newborn. Given the physiological, emotional, and nutritional consequences, there is a pressing need for structured, evidence-based interventions to address breast engorgement effectively.

This study aims to evaluate the effectiveness of RPS as a safe, simple, and non-invasive technique to reduce breast engorgement and promote successful breastfeeding. Implementing this intervention can improve maternal comfort, optimize infant nutrition, and enhance overall breastfeeding satisfaction, thereby addressing a common yet preventable postpartum challenge.

AIM OF THE STUDY

To assess the effectiveness of Reverse Pressure Softening Technique on the level of breast engorgement among postnatal mothers in selected hospitals of a metropolitan city.

METHODOLOGY

The study adopted a quantitative research approach to assess the effectiveness of the Reverse Pressure Softening (RPS) technique on breast engorgement among postnatal mothers in selected hospitals of a metropolitan city. A quasi-experimental two-group pre-test post-test design was used. The study involved 80 postnatal mothers, with 40 in the experimental group and 40 in the control group, selected through non-probability purposive sampling.

Inclusion criteria included postnatal mothers with engorged breasts, who had undergone normal delivery, and were willing to participate. Exclusion criteria were mothers with nipple complications, cesarean deliveries,

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babies in NICU, or stillbirths.

Data collection was conducted over four weeks. Demographic information was collected using a structured questionnaire. Breast engorgement was assessed using the Six-Point Breast Engorgement Scale. The experimental group received RPS for 10 minutes daily, divided into two sessions (morning and evening) for three consecutive days, while the control group received routine postnatal care. Post-tests were conducted daily for both groups.

The reliability of the tool was tested using the test-retest method, yielding a correlation coefficient of 0.88, indicating high reliability. Content validity was established with input from 17 nursing experts, 2 gynecologists, and 1 statistician.

Data were analyzed using descriptive statistics (frequency, percentage, mean) for demographic characteristics and inferential statistics for hypothesis testing. Paired t-tests assessed the effectiveness of RPS within the experimental group, two-sample z-tests compared the experimental and control groups, and Fisher's exact test evaluated associations between pre-test breast engorgement levels and selected demographic variables. Data were presented in tables and graphs for clarity.

RESULT

Section A: Distribution of Demographic Variables among Postnatal Mothers

Among postnatal mothers, the majority in both experimental and control groups were aged 21– 30 years, primiparous, and living in rural areas. Most mothers followed Hindu religion and had secondary or higher education. Joint families were more common in the experimental group, while nuclear and joint families were equally represented in the control group. Monthly income of Rs. 10,001–20,000 was predominant. Most mothers were non-vegetarian, did not have personal habits, breastfed on demand, and received support for breastfeeding mainly from their mothers.

SECTION B –I

Analysis of data related to breast engorgement among the postnatal mothers in experimental group and control group before giving Reverse Pressure Softening Technique

Table No.1: Pre-test level of breast engorgement among postnatal mothers in selected hospital of metropolitan city in control group and experimental group.

N=40,40

Timepoint	Breast Engorgement	Experimental		Control	
		Frequency	%	Frequency	%
Pretest	Soft, no changes	0	0.0 %	0	0.0 %
	Slight firmness	0	0.0 %	0	0.0 %
	Firm, no tenderness	4	10.0 %	9	22.5 %
	Firm, mild tenderness	13	32.5 %	10	25.0 %
	Firm, tender	13	32.5 %	14	35.0 %
	Very firm, very tender	10	25.0 %	7	17.5 %

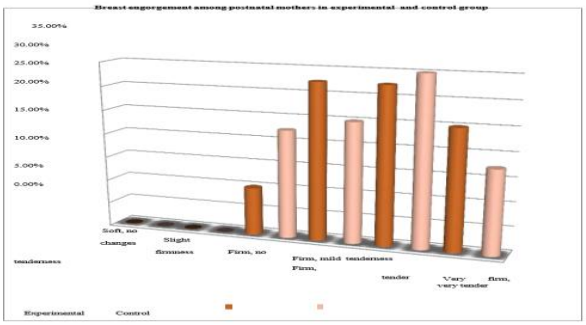

Figure No.1: Pre-test level of breast engorgement among postnatal mothers control group and experimental group

In the experimental group, 10% had firm, no tenderness; 32.5% firm, mild tenderness; 32.5% firm, tender; 25% very firm, very tender. In the control group, 22.5% had firm, no tenderness; 25% firm, mild tenderness; 35% firm, tender; 17.5% very firm, very tender.

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SECTION B- II: Analysis of data related to the effectiveness on level of breast engorgement among postnatal mothers after giving Reverse Pressure Softening Technique in experimental group.

The post-test assessment of breast engorgement in the control group (n=40) showed minimal change over the three-day period. On Day 1 morning, the majority of mothers had firm and tender breasts (35%), followed by firm, mild tenderness (25%) and very firm, very tender (17.5%). Similar patterns persisted through Day 3 evening, with slight improvements observed (e.g., 17.5% with slight firmness and 40% with firm, mild tenderness).

In contrast, the experimental group (n=40), who received the Reverse Pressure Softening Technique, demonstrated a progressive reduction in breast engorgement. On Day 1 morning, 32.5% had firm, mild tenderness, 32.5% had firm and tender breasts, and 25% had very firm, very tender breasts. By Day 3 evening, the majority exhibited soft breasts (42.5%) or slight firmness (55%), indicating significant improvement.

Statistical analysis using paired t-test showed a reduction in mean breast engorgement scores from 4.73 (pretest and Day 1 morning) to 1.60 on Day 3 evening. T-values at all posttest timepoints from Day 1 evening to Day 3 evening were significant ($p<0.001$), confirming that the Reverse Pressure Softening Technique was highly effective in reducing breast engorgement among postnatal mothers.

SECTION B – III: Analysis of data related to the comparison of the effectiveness on level of breast engorgement among postnatal mothers in selected hospital of metropolitan city in experimental group and control group.

Table No.2 Comparison of the effectiveness on level of breast engorgement among postnatal mothers in selected hospital of metropolitan city in control group and experimental group by using Two sample z-test

N=40, 40

Timepoint	Experimental		Control		z	p-value
	Mean	SD	Mean	SD		
Day1 morning	0.00	0.00	0.00	0.00		
Day1 evening	0.40	0.50	0.00	0.00	1.8	0.036
Day2 morning	1.10	0.30	0.00	0.00	8.1	0.000
Day2 evening	1.68	0.57	0.03	0.16	6.2	0.000
Day3 morning	2.38	0.49	0.65	0.48	5.6	0.000
Day3 evening	3.13	0.65	0.90	0.30	7.0	0.000

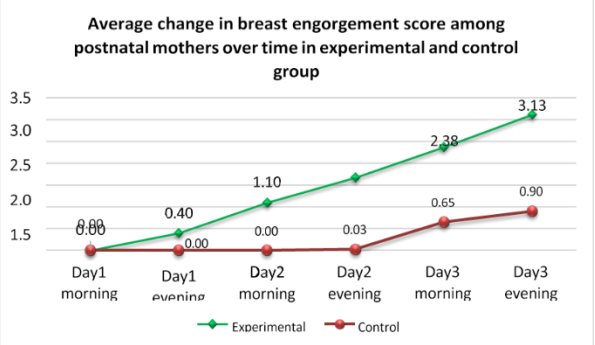

Figure No.2: comparison of level of breast engorgement among postnatal mothers in control group and experimental group

A two-sample z-test showed that the reduction in breast engorgement scores was significantly greater in the experimental group compared to the control group. Mean changes in the experimental group increased from 0 on Day 1 morning to 3.13 by Day 3 evening, while the control group showed minimal change (0–0.9). Z-values from Day 1 evening to Day 3 evening were significant ($p < 0.05$), indicating the Reverse Pressure Softening Technique effectively reduced breast engorgement. Hence, the research hypothesis (H_1) is accepted.

SECTION B- IV: Analysis of data related to association between pre-test level of breast engorgement among postnatal mothers in selected hospital of metropolitan city with their selected demographic variables in experimental group and control group.

No significant association was found between pre-test breast engorgement and demographic variables

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including age, parity, area of living, religion, education, family type, monthly income, dietary pattern, personal habits, frequency of breastfeeding, or supportive system ($p>0.05$).

DISCUSSION

The present study aimed to evaluate the effectiveness of the Reverse Pressure Softening (RPS) technique in reducing breast engorgement among postnatal mothers admitted to selected hospitals of a metropolitan city. Breast engorgement is a frequent postpartum complication that causes pain, discomfort, and difficulty in breastfeeding. The study adopted a quasi-experimental two-group pre-test post-test design with 80 postnatal mothers (40 in the experimental group and 40 in the control group). The RPS technique was administered twice daily for 10 minutes over three consecutive days, and data were collected using the six-point Breast Engorgement Scale.

The findings revealed a significant reduction in breast engorgement levels in the experimental group compared to the control group. The mean score decreased from 4.73 (pre-test) to 1.60 by Day 3 evening in the experimental group, indicating remarkable improvement, while only minimal changes were observed in the control group. The Z- values ranged from 1.8 to 8.1, with p-values < 0.05 from Day 1 evening onwards, confirming statistically significant effectiveness of the RPS technique. Therefore, the null hypothesis was rejected, demonstrating that RPS significantly reduces breast engorgement among postnatal mothers.

These findings are strongly supported by a study conducted by Ashwini Biradi, Jayashri A., and Dr. Deelip Natekar (2025) at Bagalkot, Karnataka, which reported a substantial decrease in mean engorgement scores from 4.67 to 3.10 in the experimental group, with a t-value of 6.84 at $p < 0.05$. Similarly, Priya Harit and Neha Panday (2024) in Meerut, Uttar Pradesh, found that RPS effectively reduced breast engorgement with a significant difference in post-test scores between experimental and control groups.

Both supportive studies followed quantitative experimental designs using the six-point Breast Engorgement Scale, consistent with the present study's methodology and outcomes. Collectively, these results affirm that RPS is a simple, safe, and effective non- pharmacological intervention that provides rapid relief from engorgement, improves maternal comfort, and promotes successful breastfeeding among postnatal mothers.

CONCLUSION

The present study aimed to assess the effectiveness of the Reverse Pressure Softening (RPS) technique on the level of breast engorgement among postnatal mothers. The findings revealed a significant reduction in breast engorgement scores in the experimental group compared to the control group following the application of the RPS technique. Mothers who received the intervention experienced a progressive decline in pain, tenderness, and breast fullness, indicating noticeable relief and improved comfort. In contrast, mothers in the control group showed only minimal improvement over the same period.

The statistical analysis confirmed that the differences between the experimental and control groups were significant, leading to the rejection of the null hypothesis and acceptance of the research hypothesis. These findings demonstrate that the RPS technique is effective in alleviating breast engorgement among postnatal mothers.

In conclusion, the Reverse Pressure Softening technique is a simple, non-invasive, and highly effective nursing intervention for reducing breast engorgement. It helps relieve discomfort, promotes better milk flow, supports successful breastfeeding, and enhances maternal satisfaction and confidence during the postpartum period. This method can be easily taught and implemented by nurses to improve maternal and new-born health outcomes.

Conflict of Interest

The authors certify that they are not involved in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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