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Hot Water vs. Cabbage Leaf Application: Evaluating Their Efficacy in Reducing Breast Engorgement and Pain Among Postnatal Women in a Tertiary Care Setting, Chennai

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ABSTRACT

Introduction: Breast engorgement is a common postpartum condition in lactating mothers, causing swollen, tender, and painful breasts due to excess milk accumulation. It usually occurs in the first few days after childbirth during the transition from colostrum to mature milk or due to infrequent or ineffective breastfeeding. If not properly managed, it can lead to complications such as mastitis, nipple pain, and early discontinuation of breastfeeding.
Materials and methods: A quasi-experimental design with a one-group pre-test and post-test approach utilized a non-probability purposive sampling technique on 40 cases of breast engorgement in postnatal mothers at PMCH&RI.
Results: The mean difference score was 1.65. The paired "t" test result of 5.051 was statistically significant with $p<0.001$, demonstrating the efficacy of Hot Water Application. The mean difference score was 2.75. The paired "t" test result of 7.180 was significant statistically at $p < 0.001$, suggesting that the application of cabbage leaves impacts breast engorgement.
Conclusion: The study concluded that the effective intervention of cabbage leaf application helps in reducing the level of breast engorgement among postnatal mother.

Introduction

Breast engorgement is a common postpartum condition caused by excessive milk accumulation, usually between the second and fifth days after childbirth. It leads to breast swelling, firmness, pain, and difficulty in infant latching. Contributing factors include delayed or infrequent breastfeeding, poor latch, oversupply of milk, and ineffective milk removal. If unmanaged, it can progress to complications such as blocked ducts and mastitis, potentially affecting breastfeeding continuation.

Breastfeeding remains the optimal nutrition for infants, and proper management of engorgement is crucial for maternal comfort and successful lactation. Management includes frequent feeding, correct latch techniques, warm compresses before

feeding, cold compresses afterward, gentle massage, and milk expression. Non-pharmacological interventions such as acupuncture, cabbage leaf compresses, alternating hot-cold compresses, massage, and ultrasound therapy are commonly used. Pharmacological treatment primarily involves analgesics like paracetamol and ibuprofen.

Cabbage leaves help reduce engorgement by improving blood flow and decreasing tissue congestion through capillary dilation. They contain magnesium, oxalates, and sulfur compounds with anti-inflammatory and soothing effects. Hot water application reduces pain and stiffness by increasing blood flow and promoting tissue healing.

Breast engorgement affects a large proportion of breastfeeding mothers globally, with prevalence estimates ranging from 15%–75%, depending on region. In India, including TamilNadu and Chennai, rates are notably high (65%–85%). Many mothers discontinue breastfeeding early due to pain associated with engorgement.

SIGNIFICANCE AND NEED FOR THE STUDY

Global prevalence of breast engorgement: 60–90%, mostly in the first postpartum week.India (2022–2024): The prevalence is 65–75%.Tamilnadu the prevalence of breast engorgement is 65% - 75% There are many medical and nursing measures Hot water application is supported by study conducted by Sunandha S. Nagre in the year 2023 .Cabbage leaf application is supported by a study conducted by Dhoom Sushmaben and Janaki in the year 2024.

AIM OF THE STUDY

To assess their Efficacy in Reducing Breast Engorgement and pain among postnatal mothers.

Materials and methods:

A Quantitative research approach was to assess the effectiveness of hot water application versus cabbage leaf application using a quasi-experimental design with a one-group pre-test and post-test approach utilized a non-probability purposive sampling technique . The independent variable was the Hot water application, cabbage leaf dependent variables were Post natal mothers with breast engorgement. The study was conducted at Panimalar Medical college Hospital and Research Institute , Chennai, among 40 Postnatal mothers with breast Engorgement. The sample size of 40 was determined using power analysis and selected through Purposive sampling. Inclusion criteria were students aged 18–35 years with breast engorgement fluent in Tamil and English, and willing to participate, while mothers unwilling to participate, lacking formal education, or allergic to cabbage smell ,breast surgery and mental illness were excluded. Data were collected using a demographic variables 6-item and obstetrical variables 7 items multiple-choice and six point breast engorgement scale for assess the breast engorgement and Numerical pain scale for assess the pain level . Content validity was ensured by expert review, and reliability was confirmed through a pilot study. Ethical approval was obtained (PMCHRI-IHEC-277), informed consent and confidentiality were maintained, and participation was voluntary. The pilot study confirmed the feasibility and reliability of the methodology.

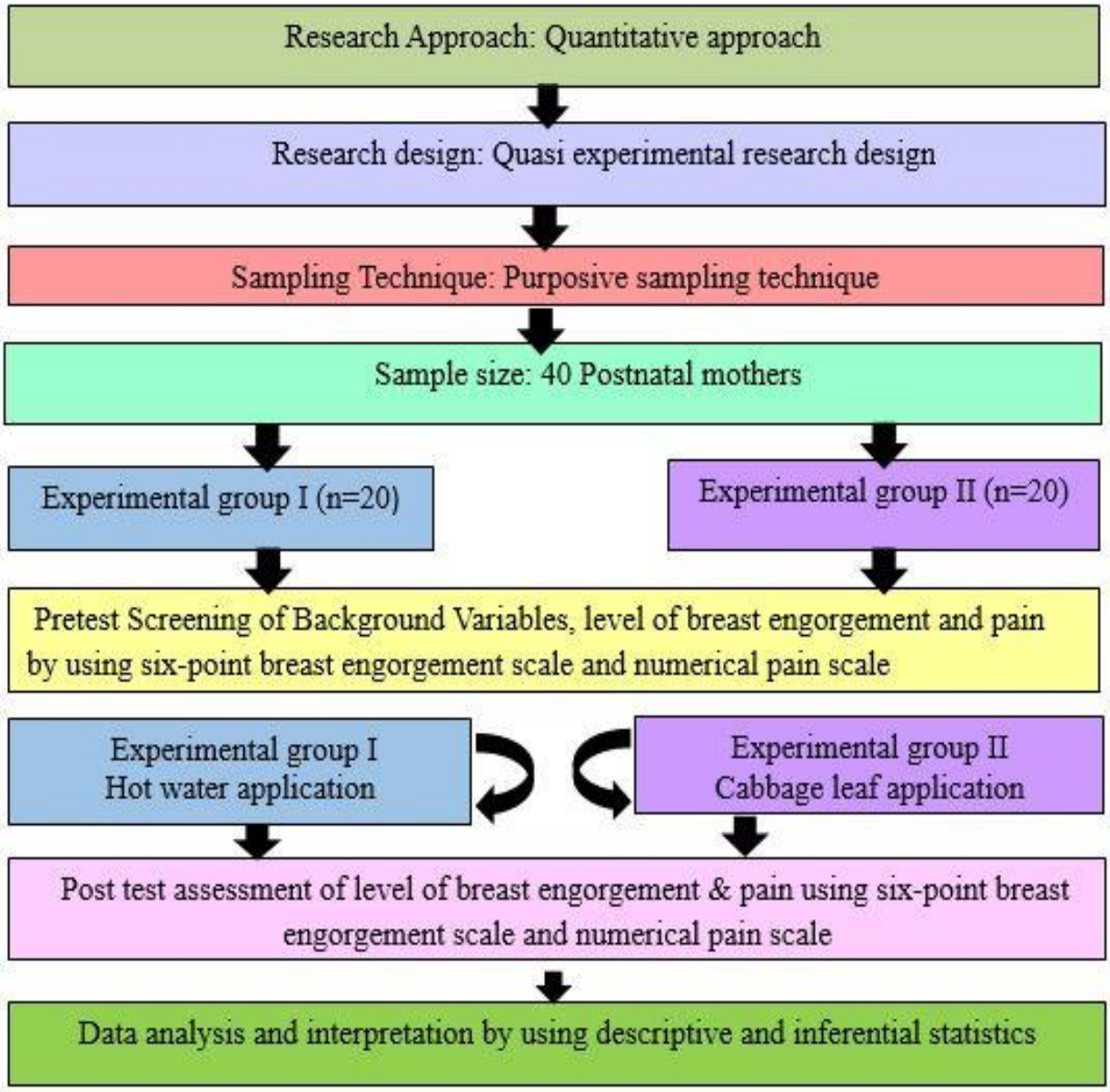

Fig. 1 SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY

STATISTICAL ANALYSIS

Table 1 Demographic Variables in Group I (Hot Water Application) and Group II (Cabbage Leaves)

N= 40(20+20)

Demographic Variables	Hot Water Application		Cabbage Leaves		Chi-Square & p-value
	F	%	F	%	
Age					χ^2=0.220 df=3 p=0.974 NS
18 – 22 years	3	15.0	4	20.0	
23 – 27 years	7	35.0	7	35.0	
28 – 32 years	7	35.0	6	30.0	
>32 years	3	15.0	3	15.0	
Religion					χ^2=4.792 df=2 p=0.091 NS
Hindu	15	75.0	17	85.0	
Christian	5	25.0	1	5.0	
Muslim	0	0	2	10.0	
Others	-	-	-	-	
Level of education					χ^2=0.183 df=2 p=0.913 NS
No formal education	-	-	-	-	
Primary education	4	20.0	4	20.0	
Higher secondary education	4	20.0	3	15.0	
Graduate	12	60.0	13	65.0	
Occupation					χ^2=4.792 df=3 p=0.188 NS
Housewife	0	0	1	5.0	
Coolie	0	0	1	5.0	
Private employee	5	25.0	1	5.0	
Government employee	15	75.0	17	85.0	
Monthly income					χ^2=1.183 df=3 p=0.757 NS
<Rs.10,000	4	20.0	3	15.0	
Rs.10,001 – Rs.20,000	10	50.0	8	40.0	
Rs.20,001 – Rs.30,000	4	20.0	7	35.0	
Above Rs.30,000	2	10.0	2	10.0	
Type of family					χ^2=0.120 df=3 p=0.989 NS
Nuclear family	7	35.0	6	30.0	
Joint family	11	55.0	12	60.0	
Extended family	1	5.0	1	5.0	
Separated family	1	5.0	1	5.0	

Shows that most of the postnatal mothers, 7(35%) in Group I and Group II were aged between 23 – 27 and 28 – 32 years respectively, 15(75%) in Group I and 17(85%) in Group II were Hindus, 12(60%) in Group I and 13(65%) in Group II were graduates, 15(75%) in Group I and 17(85%) in Group II were government employees, 10(50%) in Group I and 8(40%) in Group II had monthly income of Rs.10,001 – Rs.20,000 and 11(55%) in Group I and 12(60%) in Group II belonged to joint family.

Table 2: Obstetrical variables in Group I (Hot Water Application) and Group II (Cabbage Leaves).

N = 40(20+20)

OBSTETRICAL VARIABLE	Hot Water Application		Cabbage Leaves		Chi-Square & p-value
	F	%	F	%	
Parity					χ^2=0.424 df=2 p=0.809 NS
Primi para	13	65.0	13	65.0	
Multi para	6	30.0	5	25.0	
Grand multipara	1	5.0	2	10.0	
Mode of delivery					χ^2=0.190 df=2 p=0.909 NS
Forceps delivery	4	20.0	3	15.0	
Normal vaginal delivery	6	30.0	6	30.0	
Cesarean section	10	50.0	11	55.0	
Initiation of breastfeeding					χ^2=1.711 df=2 p=0.425 NS
Within half hours after delivery	10	50.0	6	30.0	
8 hours	6	30.0	9	45.0	
Above 12 hours	4	20.0	5	25.0	
Duration of breastfeeding					χ^2=2.013 df=2 p=0.365 NS
15 – 20 minutes on both breast	6	30.0	8	40.0	
15 – 20 minutes on one breast	13	65.0	9	45.0	
Less than 15 minutes	1	5.0	3	15.0	
Frequency of breast feeding in a day					χ^2=4.333 df=2 p=0.115 NS
1 – 4 times	12	60.0	9	45.0	
5 – 8 times	1	5.0	6	30.0	
9 – 12 times	7	35.0	5	25.0	
Postnatal day of engorgement					χ^2=0.965 df=3 p=0.810 NS
2 days	10	50.0	8	40.0	
3 days	3	15.0	2	10.0	
4 days	3	15.0	4	20.0	
5 and above	4	20.0	6	30.0	
Number of days admitted in hospital					χ^2=0.867 df=2 p=0.648 NS
1 day	-	-	-	-	
2 days	4	20.0	2	10.0	
3 days	7	35.0	7	35.0	

OBSTETRICAL VARIABLE	Hot Water Application		Cabbage Leaves		Chi-Square & p-value
	F	%	F	%	
>3 days	9	45.0	11	55.0	
Previous history of breast problems					χ^2=1.026 df=1 p=0.311 NS
Yes	19	95.0	20	100.0	
No	1	4.0	0	0	

shows that most of the postnatal mothers, 13(65%) in Group I and Group II were primi Para mothers, 10(50%) in Group I and 11(55%) in Group II had caesarean section, 10(50%) in Group I and 9(45%) in Group II had initiated the breast feeding within half hours after delivery and 8 hours respectively, 13(65%) in Group I and 9(45%) in Group II had breast fed for 15 – 20 minutes on one breast, 12(60%) in Group I and 9(45%) in Group II had breast fed in a day for 1 - 4 times, 10(50%) in Group I and 8(40%) in Group II were in 2 postnatal days of engorgement, 9(45%) in Group I and 11(55%) in Group II were admitted in hospital for >3 days and 19(95%) in Group I and 20(100%) in Group II had no previous history of breast problems

Table 3: distribution of pre-test and posttest level of breast engorgement among postnatal mothers in Group I (Hot Water Application).

N = 20

Level of Breast Engorgement	Pretest		Post test	
	F	%	F	%
Soft and No changes	-	-	2	10.0
Slight changes	-	-	6	30.0
Firm and non-tender	2	10.0	3	15.0
Firm and beginning tenderness	3	15.0	4	20.0
Firm and tender	9	45.0	3	15.0
Very Firm and Very tender	6	30.0	2	10.0

In the pre-test, 9 (45%) postnatal mothers had firm and tender breasts, 6 (30%) had very firm and very tender breasts, 3 (15%) had firm breasts with beginning tenderness, and 2 (10%) had firm, non-tender breasts. After the intervention, 6 (30%) showed slight breast changes, 4 (20%) had firm breasts with beginning tenderness, 3 (15%) had firm and tender or firm and non-tender breasts, and 2 (10%) had soft breasts or very firm and very tender breasts.

Table 4: distribution of pre-test and post test level of Pain among postnatal mothers in Group I (Hot Water Application).

N = 20

Level of Pain	Pretest		Post test	
	F	%	F	%
No Pain (0)	-	-	8	40.0
Mild pain (1-3)	2	10.0	7	35.0
Moderate pain (4-7)	12	60.0	3	15.0
Sever pain (8-10)	6	30.0	2	10.0

In the pre-test, 2 (10%) postnatal mothers had mild pain, 12 (60%) had Moderate pain ,6 (30%) had Sever pain and 0 (0%) had no pain. After the intervention, 8 (40%) showed No pain , 7(35%) had mild pain, 3 (15%) had Moderate pain, and 2 (10%) had sever pain.

Table 4: distribution of pre-test and posttest level of breast engorgement among postnatal mothers in Group II (Cabbage Leaves).

N = 20

Level of Breast Engorgement	Pretest		Post test	
	F	%	F	%
Soft and No changes	-	-	9	45.0
Slight changes	-	-	6	30.0
Firm and non-tender	4	20.0	2	10.0
Firm and beginning tenderness	4	20.0	3	15.0
Firm and tender	6	30.0	-	-
Very Firm and Very tender	6	30.0	-	-

In the pre-test, 30% of postnatal mothers had firm and tender breasts, another 30% had very firm and very tender breasts, and 20% had firm, non-tender breasts or firm breasts with beginning tenderness. After the intervention, 45% had slight or no changes, 30% showed slight breast changes, 15% had firm breasts with beginning tenderness, and 10% had firm, non-tender breasts.

Table 4: distribution of pre-test and post test level of Pain among postnatal mothers in Group II (Cabbage Leaves).

N = 20

Level of Pain	Pretest		Post test	
	F	%	F	%
No Pain	-	-	15	75.0
Mild pain	4	20.0	3	15.0
Moderate pain	10	50.0	2	10.0
Sever pain	6	30.0	0	0

In the pre-test, 4 (20%) postnatal mothers had mild pain, 10 (50%) had Moderate pain ,6 (30%) had Sever pain and 0 (0%) had no pain. After the intervention, 15 (75%) showed No pain , 3(15%) had mild pain, 2(10%) had Moderate pain, and 0 (0%) in sever pain.

Table 5: Comparison of pre-test and post test scores on breast engorgement among the postnatal mothers and between the Group I (Hot Water Application) and Group II (Cabbage Leaves)

N = 40(20+20)

Group	Pretest		Post Test		Mean Difference score	Paired 't' test & p-value
	Mean	S.D	Mean	S.D		
Group I (Cold Water Application)	4.95	0.94	3.30	1.56	**1.65**	**t = 5.051 p=0.0001, S*****
Group II (Cabbage Leaves)	4.70	1.13	1.95	1.09	**2.75**	**t = 7.180 p=0.0001, S*****
Mean Difference score	0.25		**1.35**		***p<0.001, **p<0.01 S – Significant NS – Not Significant, p>0.05	
Student Independent 't' test value	t = 0.760 p=0.452 NS		**t = 3.165 p=0.003 S****			

The above finding infers that Cabbage Leaves administration on breast engorgement was found to be effective than the Hot Water Application on Breast engorgement.

LIMITATIONS

- Since it is a new procedure to most of the mothers the Researcher found difficulty in making them to understand the merits.
- More privacy was needed to do the procedure.

CONCLUSION

The purpose of this study was to prove the significant reduction of breast engorgement by applying cabbage leaf and hot water application among postnatal mothers with breast engorgement. Cabbage leaf application and hot water application both are effective in reducing breast engorgement whereas the cabbage leaf is more effective than hot water application which is statistically highly significance.

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