Effectiveness of chilled cabbage leaves versus hot application on breast engorgement among postnatal mothers in selected hospitals of Vadodara, Gujarat, India

ABSTRACT

Background of the study

Breast feeding is important imperious in the mother's life. Breast milk may be complete healthy and salubrious supplement for the baby to help of the conjointly growth and development [1]. Breast engorgement causes discomfort and tenderness and pain that affect breastfeeding mothers early in the postpartum**. The breast engorgement is one of the main factors contributing to early interruption of breastfeeding.** ~~Results of the engorgement are a major contributing factor to the early cessation of breastfeeding~~. Very few researches have been proven to monitor the effect of cabbage leaves application on breast engorgement.[2]

Methodology: A quasi-experimental design two group pretest posttest design was used. A conceptual framework of Imogene king goal attainment model (1981) used for the conceptualization of the study. Total samples of 40 postnatal mothers were selected for the study using non probability purposive sampling technique. The samples divided in two experimental groups i.e. 20 in chilled cabbage leaves and 20 in hot application (temperature 43-46 degree Celsius - **wouldn't that temperature be high for the skin? How many degrees are ideal for the skin?)** and tool used sociodemographic, pain scale & breast engorgement checklist and post test data collected after the intervention on 3rd day **(what is the evidence to be in 3rd day?)**

Result: Both the intervention, chilled cabbage leaves and hot application were effective and reduced pain in postnatal mothers ($p=0.001^*$) at $p<0.05$ level. In chilled cabbage leaves & hot application are equally effective in reduced breast engorgement in postnatal mothers ($p=0.001^*$) at $p<0.05$ level.

Conclusion: Findings of chilled cabbage leaves and hot application were effective and reduced pain and breast engorgement among postnatal mothers.

Keywords*:* ***Does not have in the Desc of the BVS:*** ~~*Chilled cabbage leaves hot application, breast engorgement*~~, ***I found in the Desc these separate words****: postnatal; mother*

INTRODUCTION

The Breast engorgement is causes discomfort and tenderness and pain that have an effect on breastfeeding mothers early within the postnatal period. ~~results of the engorgement are a serious causative issue to the first stoppage of breastfeeding~~. **Engorgement is one of the most serious causal problems for the first interruption of breastfeeding,** only a few research are evidenced to watch the result of cabbage leaves application on breast engorgement [2]. According to the world bank female, population in India 48.0 % 2020 [3]. As per the estimated population of female in Gujrat 2021 is 36.714,10 [4]. According to the world bank health organization 2017 MMR 145 by 2021[5]. According to international institute for population sciences engorgement happens in 72 to 78 shares of postpartum mothers among each 6 to 10 woman suffer with breast engorgement. [6]

Objectives of the study:

1) Assess the level of breast engorgement among postnatal mothers.
2) Assess the effectiveness of chilled cabbage group on breast engorgement among postnatal mothers as measured by pain scale and breast engorgement checklist.
3) Assess the effectiveness of hot application group on breast engorgement among postnatal mothers as measured by pain scale and breast engorgement checklist.
4) Compare the effect of chilled cabbage leaves group versus hot application group on breast engorgement.
5) Find out the association between pre-intervention level of breast engorgement of postnatal mothers of both chilled cabbage leaves group hot application group with sociodemographic variables of postnatal women.

HYPOTHESES:

H_1. There will be significant difference between mean pretest and posttest breast engorgement score after chilled cabbage leaves group among postnatal mothers.
H_2. There will be significant difference between mean pretest and posttest breast engorgement score after hot application group among postnatal mothers.

H_3. There will be significant difference between in mean post-test breast engorgement score after chilled cabbage leaves group versus hot application group among postnatal mothers.

H_4. There will be significant relationship between pre intervention breast engorgement score in chilled cabbage leaves group and hot application group with the selected sociodemographic variables among postnatal mothers.

METHODOLOGY

Research approach: Quantitative research approach

Research design: Quasi-experimental two group pretest posttest design

How much time and frequency of application of the compresses? It's very important, because as hot and cold also burn the skin.

Variable under study

Independent variable: chilled cabbage leaves & hot application

Dependent variable: breast engorgement

Demographic variables: Age, education, occupation, religion, residency, type of family, Food habits, Mode of delivery, Number of pregnancies (including present pregnancy), Time of initiation of breast feeding

Research Setting: Study was conducted in Parul Sevashram hospital Waghodia Vadodara.

population **:** Postnatal mothers

Sample and Sampling Technique: the sample was selected using non probability purposive sampling technique. In this study sample size consisted of forty (40) mothers. The sample was divided in to two groups. About 20 postnatal mothers were assigned in chilled cabbage leaves group and 20 mothers in hot application group.

Selection Criteria for sample

Inclusion criteria: Postnatal women

Who have had a full term delivery, who have delivered within five days period, having breast engorgement, who are willing to participate in study and who breast feed their baby.

Exclusion criteria: diagnosed to have breast complication such as cracked nipple, mastitis, Breast abscess, diagnosed to have allergy to cabbage leaves, taking pharmacology & nonpharmacological treatment of breast engorgement.

Data collection tool/ technique

Self-administration questioner

Part 1: The investigator constructed this tool to collect the background data of the study subjects and to identify the influence of sample characteristics with the development of breast engorgement. Demographic proforma consist of 10 items includes Age, Education status, occupation status, religion, residency, type of family, food habits, mode of delivery, number of pregnancies, frequency of feeding.

Part- 2 Breast engorgement check list. Breast engorgement checklist consist of 5 items includes redness, warmth, hardness, swelling, lactation.

Part-3 Numerical pain rating scale: which pain scale chosen?

It is standardized numerical pain rating scale to assess the level of pain in breast engorgement.

RESULT AND DISCUSSION

Section I:

Table 1: Frequency and percentage distribution of socio-demographic in postnatal mothers.

n=40

Demographic Variables	**Chilled cabbage leaves group n=20**		**Hot application group n=20**	
1.Age in years	**Frequency (f)**	**Percentage (%)**	**Frequency (f)**	**Percentage (%)**
a.18-20 years	2	10	2	10
b.21-25 years	6	30	5	25
c.26-30 years	8	40	7	35
d.31-35 years	4	20	6	30
2. Education status				
a.no formal education	1	5	1	5
b. primary education	7	35	6	30
c. secondary education	6	30	5	25
d. higher secondary	3	15	4	20
e. Graduation	3	15	4	20
3. Occupation status				
a. home worker	9	45	7	35
b. government employed	2	10	2	10
c. Self-employed	6	30	4	20
d. private employed	3	15	7	35

4. Religion				
a. Hindu	15	75	12	60
b. Christian	2	10	3	15
c. Muslim	3	15	5	25
5. Residency				
a. Urban	9	45	12	60
b. Rural	11	55	8	40
6. Type of family				
a. Nuclear	14	70	8	40
b. Joint	6	30	12	60
7. Food habits				
a. Vegetarian	10	50	9	45
b. non-vegetarian	4	20	3	15
c. Mixed	6	30	8	40
8. Mode of delivery				
a. Normal vaginal delivery	9	45	9	45
b. Lower segment caesarean section	10	50	9	45
c. Forceps delivery	0	0	1	5
d. Ventouse delivery	1	5	1	5
9. Number of pregnancies (including present pregnancy)				
a. One	6	30	6	30
b. Two	10	50	10	50
c. 3 or more	4	20	4	20
10. Time of initiation of breast feeding				
a. Within half an hour of delivery	3	15	2	10
b. Within one hour of delivery	9	45	13	65
c. Within two hours of delivery	7	35	5	25
d. After 2 hours	1	5	0	0

Table 1. depicts the frequency and percentage distribution of the demographic variables of postnatal mothers. According to their age in chilled cabbage leaves group majority 8(40%) were in 26-30 years of age. In hot application group majority 7(35%) were in 26-30 years of age.

Data on educational status of postnatal mothers revealed that in chilled cabbage leaves group maximum 7(35%) were had up to primary education, in hot application group maximum 6(30%) were had up to primary education.

As per occupational status of postnatal mothers in chilled cabbage leaves group majority 9(45%) were home worker. In hot application group majority 7(35%) were home worker, 7(35%) were private employed.

With regard to religion of postnatal mothers in chilled cabbage leaves group maximum 15(75%) belongs to Hindu. In hot application group maximum 12(60%) belongs to Hindu.

Data on residency of postnatal mothers showed that in chilled cabbage leaves group majority 11(55%) were living in rural area. In hot application group majority 12(60%) were living in urban area.

According to type of family of postnatal mothers in chilled cabbage leaves group majority 14(70%) were living in nuclear family. In hot application group majority 12(60%) were living in joint family.

As per food habits of postnatal mothers in chilled cabbage leaves group maximum 10(50%) were vegetarian. In hot application group maximum 9(45%) - **Were vegetarian. there is a certain logic why vegetarian people should have cabbage leaves at home**

With regard to mode of delivery of postnatal mothers in chilled cabbage leaves group majority 10(50%) had lower segment caesarean section. In hot application group majority 9(45%) had lower segment caesarean section, 9(45%) had normal vaginal delivery.

According to number of pregnancies of postnatal mothers in chilled cabbage leaves group maximum 10(50%) had two pregnancies. In hot application group 10(50%) had two pregnancies.

With regard to time of initiation of breast feeding of postnatal mothers in chilled cabbage leaves group majority 9(45%) had initiated breast feeding within one hour of delivery. In hot application group majority 13(65%) had initiated breast feeding within one hour of delivery.

The homogeneity test was done between demographic variables of chilled cabbage leaves group and hot application group using chi-square test. Results showed that all the demographic variables were found non-significant and hence they are homogenous and comparable.

Section II:

Fig 1: Distribution of pre-test and post-test level of pain among postnatal mothers in chilled cabbage leaves group and hot application group

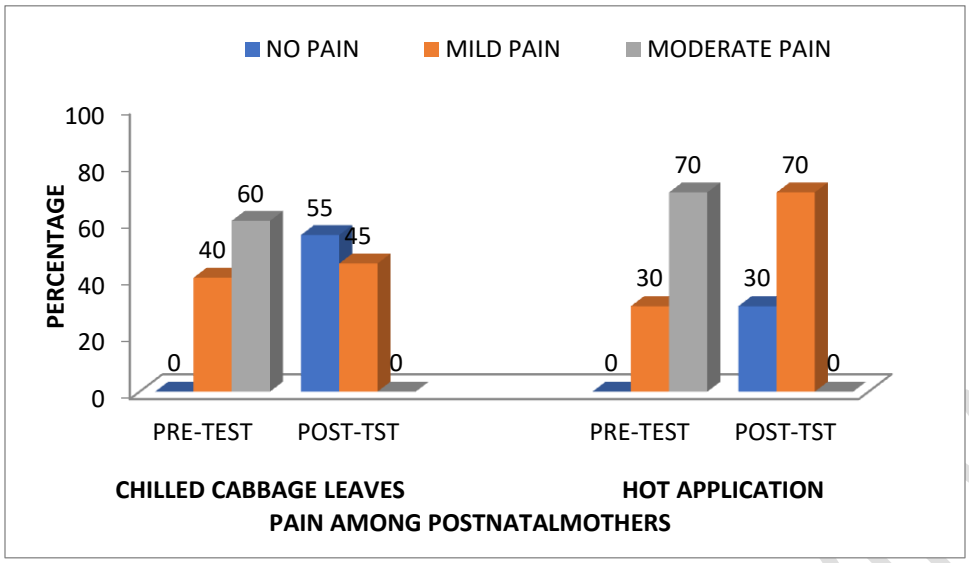

Fig.1: Results showed that in chilled cabbage leaves group pre-test majority 12(60%) had moderate pain and 8(40%) had mild pain while in post-test majority 11(55%) had no pain and 9(45%) had mild pain. In hot application group maximum 14(70%) had moderate pain and 6(30%) had mild pain while in post-test majority 14(70%) had mild pain and 6(30%) had no pain.

Fig 2: Distribution of pre-test and post-test level of breast engorgement among postnatal mothers in chilled cabbage leaves group and hot application group

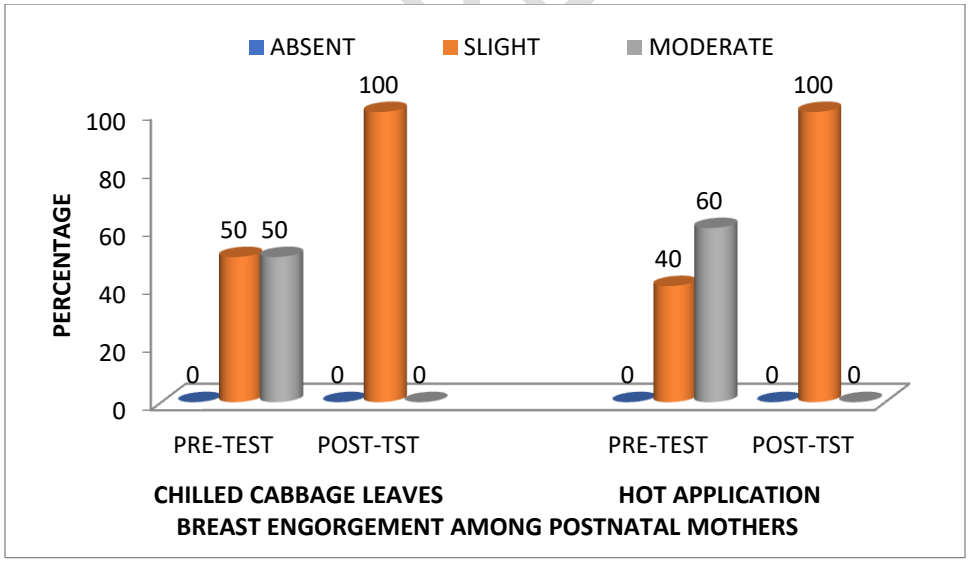

Fig.2: Results showed that in chilled cabbage leaves group pre-test majority 10(50%) had slight breast engorgement and 10(50%) had moderate breast engorgement while in post-test all the postnatal mothers 20(100%) had slight breast engorgement. In hot application group maximum 12(60%) had moderate

breast engorgement and 8(40%) had slight breast engorgement while in post-test majority all the postnatal mothers 20(100%) had slight breast engorgement

Section III:

Fig 3.: Distribution of mean and SD of pain score of postnatal mothers in chilled cabbage leaves group and hot application group

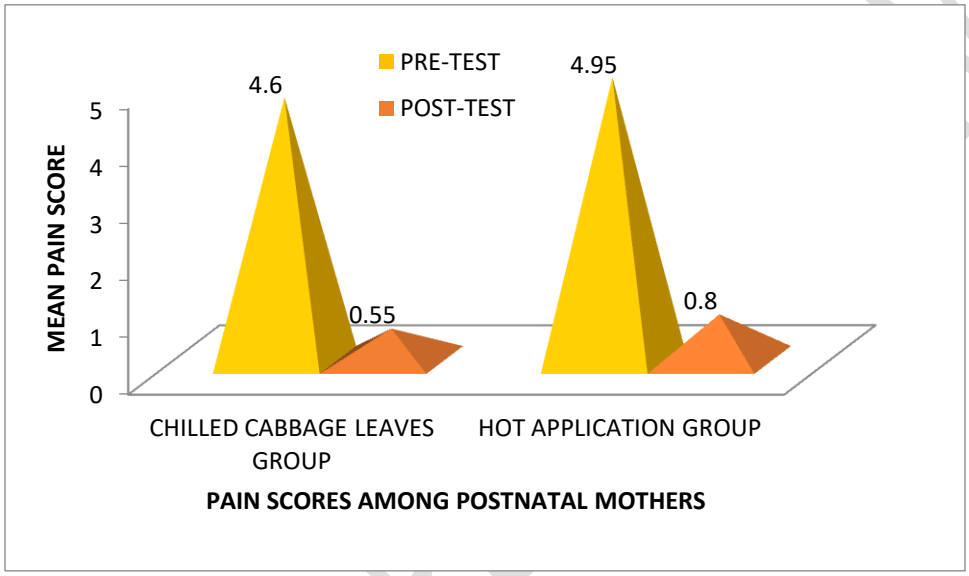

Fig. 3: Illustrates to evaluate the effect of chilled cabbage leaves group and hot application group on pain among postnatal mothers. In chilled cabbage leaves group pre-test mean pain score was 4.60±1.142 and post-test mean pain score was 0.55±0.686 with mean difference of 4.05. The mean pre-test and post-test pain score was tested by using paired t test with obtained (t=15.80, df=19, p=0.001) was statistically significant at $p<0.05$ level. In hot application group pre-test mean pain score was 4.95±0.999 and post-test mean pain score was 0.80±0.616 with mean difference of 4.15. The mean pre-test and post-test pain score was tested by using paired t test with obtained (t=21.20, df=19, p=0.001*) was statistically significant at $p<0.05$ level. A hence posttest mean lower than pretest mean. H_1, H_2 Hence research hypotheses accepted.

Fig 4.: Distribution of mean and SD of breast engorgement score of postnatal mothers in chilled cabbage leaves and hot application

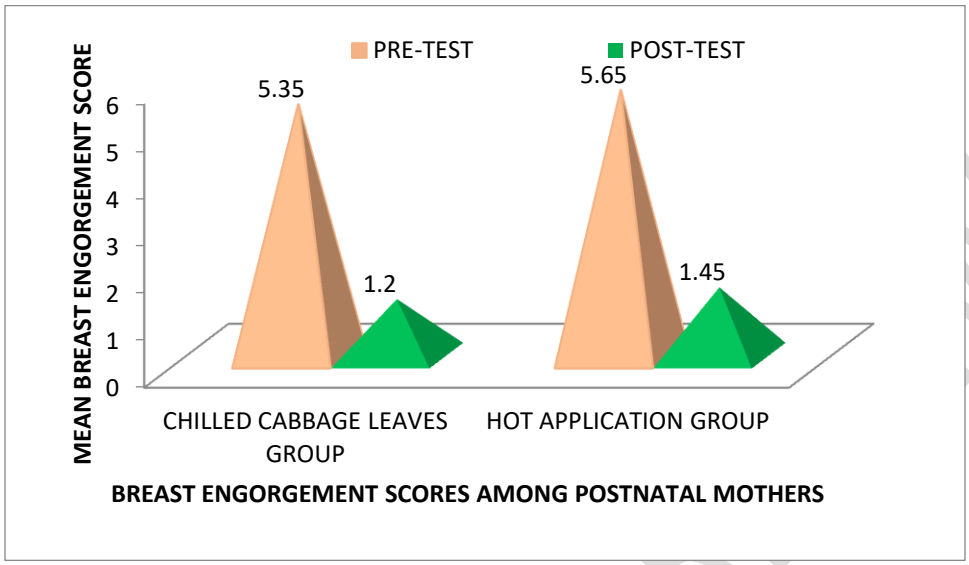

Fig 4: Illustrates to evaluate the effect of chilled cabbage leaves group and hot application group on breast engorgement among postnatal mothers. In chilled cabbage leaves group pre-test mean breast engorgement score was 5.35±1.137 and post-test mean breast engorgement score was 1.20±0.410 with mean difference of 4.15. The mean pre-test and post-test breast engorgement score was tested by using paired t test with obtained (t=15.70, df=19, p=0.001) was statistically significant at $p<0.05$ level. In hot application group pre-test mean breast engorgement score was 5.65±1.089 and post-test mean breast engorgement score was 1.45±0.510 with mean difference of 4.20. The mean pre-test and post-test breast engorgement score was tested by using paired t test with obtained (t=19.74, df=19, p=0.001) was statistically significant at $p<0.05$ level. A hence posttest mean lower than pretest mean. Hence are research hypotheses H_1, H_2 accepted

Section: IV

Table 2: Compare the effect of chilled cabbage leaves group and hot application group on pain and breast engorgement among postnatal mothers

n=40

Post-test Comparison		**Mean**	**SD**	**Mean D**	**t value**	**Df**	**p value**
Pain	**Cabbage leaves group**	0.55	0.686	0.25	1.213	38	0.233

	Hot application group	0.80	0.616				NS
Breast engorgement	**Cabbage leaves group**	1.20	0.410	0.25	1.707	38	0.096 NS
	Hot application group	1.45	0.510				

Table 2: depicts the comparison of effect of chilled cabbage leaves group and hot application group on pain and breast engorgement among postnatal mothers. In chilled cabbage leaves group mean post-test pain score was 0.55±0.686 and in hot application group mean post-test pain score was 0.80±0.616 with mean difference of 0.25. The mean post-test pain score between chilled cabbage leaves application and hot application group was tested by using unpaired t test with obtained (t=1.213, df=38, p=0.233) was statistically non-significant at p<0.05 level. In chilled cabbage leaves group mean post-test breast engorgement score was 1.20±0.410 and in hot application group mean post-test breast engorgement score was 1.45±0.510 with mean difference of 0.25. The mean post-test breast engorgement score between chilled cabbage leaves group and hot application group was tested by using unpaired t test with obtained (t=1.707, df=38, ~~p = 0,233~~ **0.096**) was statistically non-significant at p<0.05 level.

Section V:

association between pre-test level of pain of postnatal mothers in chilled cabbage leaves group and hot application with their selected demographic variables which was tested by using chi-square test. The chi square values showed that age X^2 = 5.938 & X^2=3.107 , educational status X^2 = 5.714 & X^2=0.442 , occupational status X^2 = 2.407 & X^2=4.508 , religion X^2= 1.667 & X^2=0.397 , residency X^2= 0.135 & X^2= 0.357, type of family X^2= 0.357 & X^2= 3.220, food habits X^2= 2.569 & X^2= 2.615, mode of delivery X^2= 0.741& X^2= 3.669, number of pregnancy X^2= 0.625 & X^2= 1.270 and time of initiating breast feeding X^2= 2.011 & X^2= 1.099 of postnatal mothers were statistically found non-significant association at p<0.05 level with pre-test level of pain.

association between pre-test level of breast engorgement of postnatal mothers in chilled cabbage leaves and hot application group with their selected demographic variables which was tested by using chi-square test. The chi square values showed that age X^2= 3.001 & X^2= 4.514, educational status X^2= 7.905& X^2= 7.153, occupational status X^2= 2.005 & X^2= 0.506, religion X^2= 2.400 & X^2= 0.069, residency X^2= 0.202 & X^2= 1.035, type of family X^2= NA & X^2= 1.746, food habits X^2= 1.667 & X^2= 2.011 , mode of delivery X^2= 1.111 & X^2= 4.259, number of pregnancy X^2= NA & X^2=

0.278 and time of initiating breast feeding X^2= 1.587 & X^2= 2.179 of postnatal mothers were statistically found non-significant association at p<0.05 level with pre-test level of breast engorgement.

Discussion

The first objective of the study was to assess the level of pain and breast engorgement among postnatal mothers.

Results on pain showed that in chilled cabbage leaves group pre-test majority 12(60%) had moderate pain and 8(40%) had mild pain while in post-test majority 11(55%) had no pain and 9(45%) had mild pain. In hot application group maximum 14(70%) had moderate pain and 6(30%) had mild pain while in post-test majority 14(70%) had mild pain and 6(30%) had no pain. **No need to repeat it, just put the result and discuss it with scientific evidence.**

Results on breast engorgement showed that in chilled cabbage leaves group pre-test majority 10(50%) had slight breast engorgement and 10(50%) had moderate breast engorgement while in post-test all the postnatal mothers 20(100%) had slight breast engorgement. In hot application group maximum 12(60%) had moderate breast engorgement and 8(40%) had slight breast engorgement while in post-test majority all the postnatal mothers 20(100%) had slight breast engorgement. **No need to repeat it, just put the result and discuss it with scientific evidence.**

Similar study was carried out by **Rajni Sharma (2018)** conducted a study to assess the effectiveness of chilled cabbage leaf application and Hot application on pain and breast engorgement among post-partum women. Results on pain showed that in chilled cabbage leaf group pre-test majority 85.9% had pain and in post-test only 13% had pain where as in hot application group pre-test majority 87% had pain and in post-test 15% had pain. Results on breast engorgement revealed that in chilled cabbage leaf group majority 80% had breast engorgement and in post-test 10% had breast engorgement, while in hot application group maximum 78% had breast engorgement and in post-test 12% had breast engorgement [9]
What is the conclusion of your research with the scientific evidence?

The second objective of the study was to evaluate the effect of chilled cabbage leaves Versus hot application on pain and breast engorgement among postnatal mothers.

In chilled cabbage leaves group pre-test mean pain score was 4.60±1.142 and post-test mean pain score was 0.55±0.686 with mean difference of 4.05. The mean pre-test and post-test pain score was tested by using paired t test with obtained (t=15.80, df=19, p=0.001) was statistically significant at p<0.05 level.

In hot application group pre-test mean pain score was 4.95±0.999 and post-test mean pain score was 0.80±0.616 with mean difference of 4.15. The mean pre-test and post-test pain score was tested by using paired t test with obtained (t=21.20, df=19, p=0.001) was statistically significant at p<0.05 level. **No need to repeat it, just put the result and discuss it with scientific evidence.**

Boi B, Koh S, Gail D (2012) conducted a study to assess the effectiveness of cabbage leaf application on pain and hardness in breast engorgement among post-partum women. Results showed that experimental group receiving cabbage leaf treatment improved from a mean score of 5.17 (70%) to 3.02 (20%) significant at (p =<0.001). Statistically significant reduction in pain scores from 1.8 points (30%) with cabbage leaf and 2.2 points (39%) with gel packs at (p=0.0001) [10]

In chilled cabbage leaves group pre-test mean breast engorgement score was 5.35±1.137 and post-test mean breast engorgement score was 1.20±0.410 with mean difference of 4.15. The mean pre-test and post-test breast engorgement score was tested by using paired t test with obtained (t=15.70, df=19, p=0.001) was statistically significant at p<0.05 level. **No need to repeat it, just put the result and discuss it with scientific evidence.**

In hot application group pre-test mean breast engorgement score was 5.65±1.089 and post-test mean breast engorgement score was 1.45±0.510 with mean difference of 4.20. The mean pre-test and post-test breast engorgement score was tested by using paired t test with obtained (t=19.74, df=19, p=0.001) was statistically significant at p<0.05 level. **No need to repeat it, just put the result and discuss it with scientific evidence.**

Study findings were supported **by Arora S, Vasta M, Dadhwal V (2021)** conducted a study to compare cabbage leaves and hot application on pain and breast engorgement among postnatal mothers. Results on pain showed that in experimental group mean score was 6.14±1.2 and in post-test was 3.45±0.40 was significant at p<0.001. Regarding breast engorgement in pre-test mean was 5.17±0.70 and post-test was 3.02±0.20 found significant at p<0.05. Comparison between experimental and control group revealed that mean score in experimental group was 3.74±0.21 and control group was 4.26±0.17 with mean difference of 0.52 was significant at p<0.03. Study concluded that cabbage leaves was effective in reduction of pain and breast engorgement among postnatal mothers.[11]

The third objective of the study was to compare the effect of chilled cabbage leaves Versus hot application on pain and breast engorgement among postnatal mothers.

In chilled cabbage leaves group mean post-test pain score was 0.55±0.686 and in hot application group mean post-test pain score was 0.80±0.616 with mean difference of 0.25. The mean post-test pain score between chilled cabbage leaves application and hot application group was tested by using unpaired t test with obtained (t=1.213, df=38, p=0.233) was statistically non-significant at p<0.05 level.

In chilled cabbage leaves group mean post-test breast engorgement score was 1.20±0.410 and in hot application group mean post-test breast engorgement score was 1.45±0.510 with mean difference of 0.25. The mean post-test breast engorgement score between chilled cabbage leaves application and hot application group was tested by using unpaired t test with obtained (t=1.707, df=38, p=0.233) was statistically non-significant at p<0.05 level.

Thakur S, Gomathi, Bala K (2018) conducted a study to assess the effectiveness of hot application on breast engorgement among the postnatal mothers. Findings showed that in experimental group mean breast engorgement score and SD was 1.60 ± 0.563 and 5.93 ± 0.254 in control group was statistically significant at p<0.05 level. Findings concluded that hot application was effective in reducing breast engorgement in experimental group than in control g to the control group.[12]

Find out the association between pre-intervention level of pain and breast engorgement of postnatal mothers of both chilled cabbage leaves group and hot application group with socio-demographic variables of postnatal women.

Findings showed that demographic variables such as age, educational status, occupational status, religion, residency, type of family, food habits, mode of delivery, number of pregnancy and time of initiating breast feeding of postnatal mothers were statistically found non-significant association with pre-test level of pain and breast engorgement in chilled cabbage leaves group and hot application group.

Wong B et al (2017) conducted a study to examine the effectiveness of cold cabbage leaves and cold gel packs application on pain, hardness due to breast engorgement among mothers. Findings revealed that no significant association was found between demographic variables of mothers with pain and breast engorgement in experimental and control group.[13]

Conclusion

The study findings showed that chilled cabbage leaves and hot application were found to be effective in reducing pain and breast engorgement among postnatal mothers, but no significant difference was found between chilled cabbage leaves

and hot application. The study concluded that chilled cabbage leaves and hot application can be promoted and recommended as an institutional policy and implemented as a routine care for all postnatal mothers having breast engorgement for reducing pain. The study suggests that hot application can be used as a cost-effective nursing intervention in reducing pain and breast engorgement and among postnatal mothers, until and unless they have allergy to cabbage leaves.

Ethical Clearance

Ethical clearance was obtained from the ethical committee of Parul University Approval Number: PUIECHR/PIMSR/00/081734/3509. Individual consent was taken from the sample before data collection. Participants were also assured for the confidentiality of the information provided. Prior to data collection, formal permission was obtained from the Medical Superintendent of selected hospital, Vadodara. Participants were informed about the nature and purpose of the study and informed consent was obtained.

Reference

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(13) Wong B et al. Effectiveness of cold cabbage leaves and cold gel packs application on pain, hardness due to breast engorgement among mothers.

Final review and considerations by the reviewer:

I have been working for 33 years with lactation management and applying warm compresses to the breasts is very risky, as the risk of burns is high and we have scientific evidence showing that it does not have the effect that was thought 20 years ago. Today, vigorous massage of the breasts and extraction

of breast milk are carried out to benefit the baby from holding on to the breast and preventing pain and breast engorgement.

In the case of the application of cold, I agree with its use, because it reduces edema and really reduces pain in the breasts. The use of cabbage leaves is controversial and has some serious risks, such as: pesticides in women's breasts and risk of plant microorganisms in these women's breasts. I'm also at risk of allergy as was said in the conclusion and would still be an additional expense to the hospital since I can apply the cold with baby diapers, for example.

The study is interesting, but 40 subjects are insufficient to scientifically prove its effectiveness.

I propose further research that scientifically proves the absence of exposed In this research, it was not explained how the applications of heat and cold were made, For example: sheets in the freezer? In the cooler? Use of hot water bags? Hot cloth application? How long do these applications last?Risks to validate the research and effectiveness of hot compresses.

I hope so, I request more subjects for research and more scientific evidence.