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"A quasi experimental study to assess the effectiveness of cold cabbage leaves application vs. hot application to relieve breast engorgement among postnatal mothers in selected PHC at Thiruvallur district ".

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Abstract
Introduction: *The birth of the baby is an important event in any family. It is therefore important for a mother to have a healthy baby; she gives her baby the best nutrition. Breast milk is the best food for babies as breast fed babies are healthier than formula - fed babies.* ***Objectives:*** *To assess the effectiveness of cold cabbage leaves application to relieve breast engorgement among postnatal mothers in selected PHC at Thiruvallur district. To assess the effectiveness of hot application to relieve breast engorgement among postnatal mothers in selected at Thiruvallur district. To compare the effectiveness of cold cabbage leaves application versus hot application to relieve breast engorgement among postnatal mothers in selected at Thiruvallur district* ***Methods:*** *A quantitative research approach was considered appropriate by keeping in view the nature of problem as it aimed to assess the effectiveness of cold cabbage leaves vs hot application to relieve breast engorgement among postnatal mothers research design*
Quasi experimental research design was conducted at Thiruvallur district the selection of the study setting is done on the basis of feasibility for conducting the study and availability of sample. The target population of study was postnatal mothers admitted at PHC at Thiruvallur district. Sample size was 60 postnatal mothers, 30 in experimental group and 30 in control group. ***Results:*** *The data presented in the table 1 shows hot application therapy the computed Chi-square value of Pre Hot application therapy and Pre Cold cabbage leaves therapy was (1.0619). This value was not found to be statistically significant at 0.05 level of significance. The Chi-square value of Post Hot application therapy and Post Cold cabbage leaves application therapy was (34.4107). This value was found to be statistically significant at 0.05 level of significance. The Chi-square value between Post hot application therapy and Pre cold cabbage leaves therapy was (56.1538). This value was found to be statistically significant at 0.05 level of significance. The Chi-square value of Pre hot application Therapy and Post Cold cabbage leave application therapy was (60).This value was found to be highly significant at 0.05 level of significance which shows hot application therapy cold cabbage therapy is more effective than Hot application therapy to relieve breast engorgement. Significant change at $p<0.05$.*

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I. Introduction

"Mankind is unique in all of creation in being made in God's image"

The birth of the baby is an important event in any family. It is therefore important for a mother to have a healthy baby; she gives her baby the best nutrition. Breast milk is the best food for babies as breast fed babies are healthier than formula - fed babies. Human milk has no substitute and breast is nature's apparatus for feeding babies. Breast feeding is an art. In recognition of the immense importance of breast feeding, the Baby - friendly hospital Initiative was launched by UNICEF/WHO in 1991. Breast feeding results in decreased problems such as infections and other medical problems. Breast feeding is one of the first bonding experiences between mother and child. The first days after childbirth define the beginning and maintenance of lactation, which sometimes includes difficulties that require specific support for women to establish the necessary self- confidence to face them. Some of the possible common disorders is poor milk production, nipple pain and trauma, breast engorgement, and other more are serious complications such as mastitis.

Breast engorgement is a physiological condition that is characterized by painful swelling of the breasts as a result of a sudden increase in milk volume, lymphatic and vascular congestion, and interstitial oedema

during the first two weeks following childbirth; this condition is caused by insufficient breastfeeding or obstruction in milk ducts.

Breast pain during breastfeeding is a common problem that interferes with successful breastfeeding leading to exclusive abandonment of breastfeeding. Over the years, numerous strategies for the treatment of this problem have been employed such as kangaroo care, fluid limitation, binding the breasts or wearing a tight brassiere, hot and cold compresses, and application of cabbage leaves. Very few researches have been conducted to monitor the effect of cabbage leaves on breast engorgement with inconclusive and conflicting results. A study on the efficacy of cabbage leaves can contribute to provide evidence for introducing this intervention in clinical practice; thus, we conducted the present study.

Previous research studies suggest that breast engorgement occurs most commonly from day three to five postpartum, with some women presenting as late as day nine to ten, or even day fourteen.

In March, 2001, World Health Organization (WHO) recommended an optimal duration of exclusive breastfeeding of six month, followed by breast feeding along with complementary foods for up to two years of age or beyond.

Many methods for the treatment of breast engorgement have been explored. These include cold cabbage compresses, cold gel pads, hot compresses and warm showers, which are used to activate the milk ejection reflex.

A study carried out by Disha et al. to know the effect of chilled cabbage leaves versus hot application on breast engorgement among postnatal mothers concluded that both the interventions were effective in relieving pain and reducing breast engorgement.

Another study conducted by Arora et al. in the postnatal ward concluded that hot and cold compresses were more effective than cold cabbage leaves in relieving pain due to breast engorgement.

A study by Prashanth et al. among postnatal mothers revealed that the cabbage leaves application was effective in control of breast engorgement.

Application of warm compression (a hand towel or sponge cloth with warm water) on the breasts just before the mother feed. It is the common method to get the milk flowing due to vasodilation.

Application of green cabbage leaves is also noticed to reduce swelling in moderate to severe breast engorgement. The common green cabbage (Brassica capitata) is used for engorgement therapy. It has been suggested that it contains a chemical sinigrin (allylisothiocynate) that is absorbed through the mother skin, which reduces edema and increases milk flow.

Application of cold compress to the breast and under the arms between feeding helps to reduce swelling. It should be for 15-20 minutes off and in for 1-2 hours. Hot (moist) water application is also one of the ancient methods used to reduce breast engorgement. The use of heat immediately before nursing can help the milk let-down. Taking warm water compresses or a heating pad may help. Gentle breast massage can also help the milk flow more rapidly. If the nipple and areola are swollen, the mother is not supposed to nurse without softening them up first. Manual expression or pump a little milk from the breast helps to soften the nipple and areola before feeding.

In this study cold cabbage leaves refers to cabbage leaves which are refrigerated in the freezer for 20 -30 minutes before application. The cabbage leaves contains sulfa compound which pass through the skin and constrict the vessels and reduces inflammation. This reduction in inflammation and swelling allows the milk to flow. Placed the freezed cold cabbage leaves on the engorged breast, leaving the
nipple exposed. Put the bra on the top of the leaves to keep them in place and keep cotton pads between leaves and bra to soak up the leaking milk. Change leaves as soon as they start to wet which should be about 20-30 minutes.

The treatment for breast engorgement includes to support the breasts with a binder or brassiere, manual expression of any remaining milk after feed, administer analgesics foe pain, the baby should be put to the breast regularly at frequent intervals the other treatment options include cabbage leaves application. Women have been using cabbage leaves to relieve breast engorgement and also it being both antibiotic and anti-irritant properties that cabbage leaves actually alleviates engorgement.

Need for the study

Breast feeding is one of the first bonding experiences between mother and child. "Breast is the best" says British Medical Journal of Breast Feeding. Breast feeding is an important woman's issue, human rights issue, health issue and feminist issue. Breast feeding empowers women.

Breast feeding the baby brings joy to the mother which cannot be expressed by words. The feeling the mother gets when she continue to nourish her baby at her breast and see the baby grow and thrive on breast milk is awesome

II. Methodology

Research approach:-

A quantitative research approach was considered appropriate by keeping in view the nature of problem as it aimed to assess the effectiveness of cold cabbage leaves vs hot application to relieve breast engorgement among postnatal mothers.

Research design:-

Quasi experimental research design

Variables:-

Independent variables:-

- Cold cabbage leaves
- hot application.

Dependent variables:-

Breast engorgement among postnatal mothers.

Research setting:-

The present study was conducted at PHC at Thiruvallur district. The selection of the study setting is done on the basis of feasibility for conducting the study and availability of sample.

Target population:-

The target population of study was postnatal mothers admitted at PHC at Thiruvallur district.

Sample size:-

Sample size was 60 postnatal mothers, 30 in experimental group and 30 in control group.

Sampling technique:-

A convenient sampling technique was used for the selection of sample.

Sampling criteria:-

Inclusion criteria:-

- Postnatal mothers who were suffering from breast engorgement
- Postnatal mothers who were willing to participate.
- Postnatal mothers who were present at time of data collection.

Exclusion criteria:-

- Postnatal mothers who were not willing to participate.
- Postnatal mothers who were not available at the time of data collection.
- Postnatal mothers who were not suffering from breast engorgement.

Selection and development of tool:-

The tool develops for present study was 6 point engorgement scale and demographical variables.

Description of the tool:-

The tool consists of two sections-

Part a: - socio-demographical profile:- socio demographic profile include simple charterstics. Such as: age, education, occupation, type of family, type of delivery, residential status, dietary habit, family income.

Part b:- breast engorgement assessment scale

Breast engorgement was assessed by using 6 point breast engorgement scale devised by hill.p.d. and humenick (1994). Clinical breast assessment was do by the investigator and the findings was interpreted and scored as per the scale.

Score interpretation:

Score 1 : soft
Score 2 : slight changes in breast
Score 3 : firm, non tender breast
Score 4 : firm, beginning tenderness in breast
Score 5 : firm, tender
Score 6 : very firm, very tender

Criterion measure:

1-2: mild engorgement
3-4: moderate engorgement
5-6: severe engorgement

Validity of the tool:-

Content validity of the tool was determined by opinion of experts from the field of nursing. The experts were asked to give their opinion on the relevance, clarity and appropriateness of tool. Valuable suggestions were incorporated in the tool after discussion with guide and co-guide.

Reliability of the tool;-

Reliability of the tool was assessed by karl pearson's method.

Data collection procedure:-

The data collection was carried out in the month of August and September 2022. Before collecting data consent was obtained from subjects. The researcher introduces herself to the responders. The respondents were explained about the importance and nature of the study.

Plan for analysis:-

- Inferential statistics
- Descriptive statistics

III. Results

This chapter deals with analysis and interpretation of data collected from sixty postnatal mothers selected PHC at Thiruvallur district on the basis of convenient sampling technique through breast engorgement scale to assess the effectiveness of cold cabbage leaves vs hot application to relieve breast engorgement. Data analysis enables the researcher to summarize, evaluate, interpret and communicate the numerical information. The analysis of data was done in accordance with objective of study. In descriptive statistics, frequency, percentage was calculated

Section A: **frequency and percentage distribution of demographical variables in the experimental group and control group**

Table1.Frequency and percenatge distribution of sample according to age in years

Age in Years	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) 18-22	4	13%	6	20%
B) 23-27	19	63%	15	50%
C)28-32	7	23%	7	23%
D)>33	0	0%	2	7%

Table 1: The data presented in the table 1 depicts that age wise distribution which shows majority of subjects ,19[63%] were in the 23-27 years of age group, 7[23%] were in the 28-32 years of age group, 4[13%] were in the 18-22 years of age group, 0[0%] were in the >33 years of age group in experimental group.

In control group majority of subjects ,15[50%] were in the 23-27 years of age group, 7[23%] were in the 28-32 years of age group, 6[20%] were in the 18-22 years of age group, 2[7%] were in the >33 years of age group.

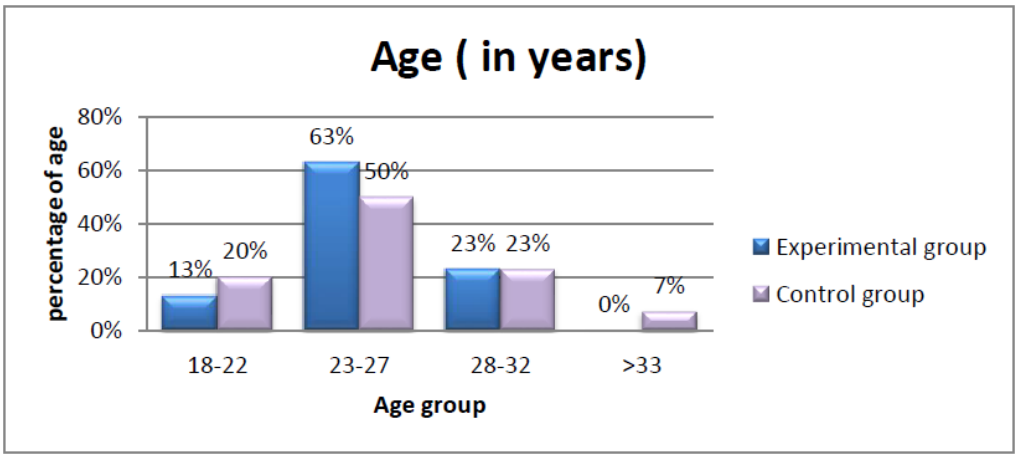

Figure3(a): A bar diagram showing percentage distribution of age (in years)

Table 2.**Frequency and percentage distribution of samples according to education**

Education	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) uneducated	4	13%	2	7%
B) primary	11	37%	11	37%
C)secondary	6	20%	9	30%
D)senior secondary	7	23%	4	13%
E)Graduate and above graduate	2	7%	4	13%

Table 2: The data presented in the table 2 depicts that education wise distribution which shows that majority of subjects 11[37%] were primary educated, 7[23%] were senior secondary educated, 6[20%] were secondary level educated, 4[23%] were un- educated, 2[7%] were graduate and above graduate in experimental group.In control group majority of subjects 11[37%] were primary level educated, 9[30%] were secondary level educated, 4[13%] were graduate and above graduate, 4[13%] were senior secondary educated, 2[7%] were uneducated.

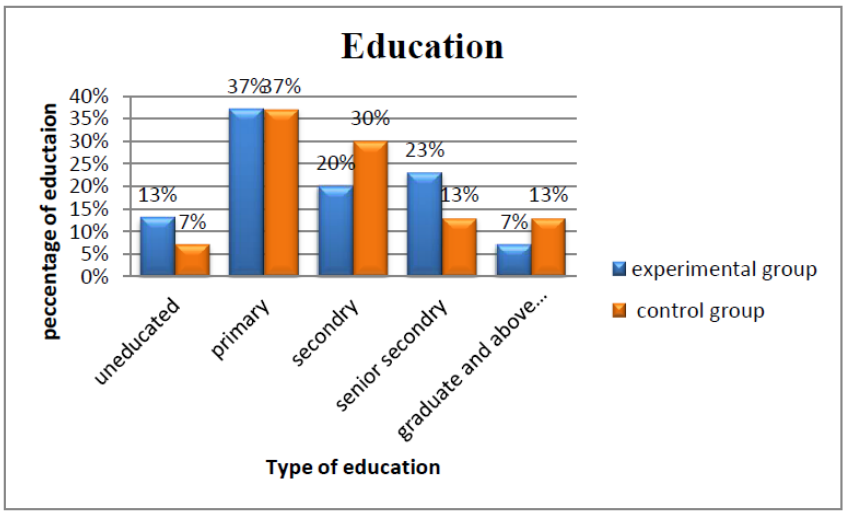

Figure 3(b) : A bar diagram showing percentage distribution of education.

Table 3. Frequency and percentage distribution of samples according to Occupation

Occupation	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) unemployed	12	40%	15	50%
B) private job	4	13%	6	20%
C)government job	1	3%	1	3%
D)own business	13	43%	8	27%

Table 3: The data presented in the table 3 depicts that occupation wise distribution which shows that the majority of subjects 13[43%] were own-business, 12[40%] were in unemployed, 4[13%] were in private job, 1[3%] were in government job in experimental group .

In control group majority of subjects 15[50%] were unemployed, 8[27%] were own business, 6[20%] were in private job, 1[3%] were government job.

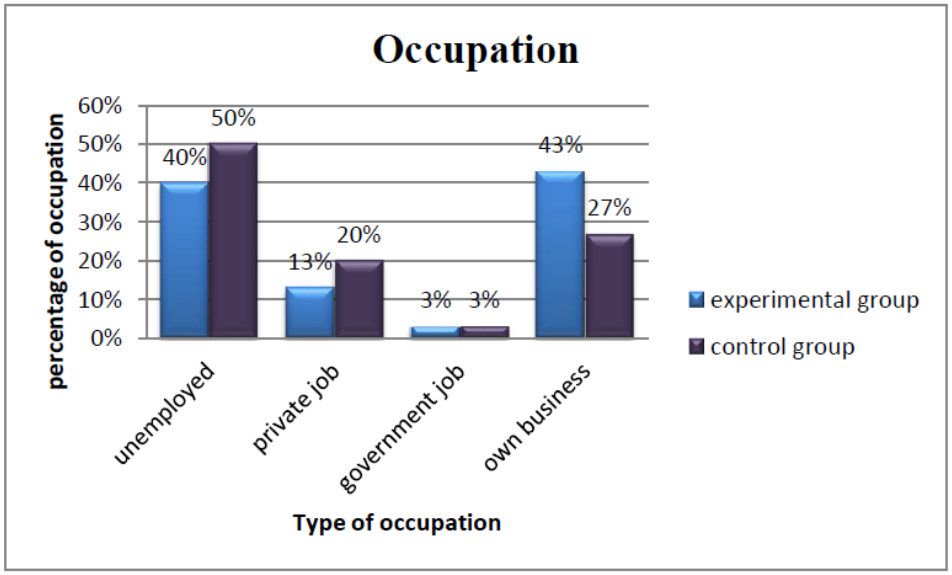

Figure 3(c): A bar diagram showing percentage distribution of occupation.

Table 4. Frequency and percentage distribution of samples according totype of family

Type of family	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) Nuclear family	17	56%	18	60%
B) Joint family	13	43%	12	40%

Table 4: The data presented in the table 4 depicts that type of family wise distribution which shows that the majority of subjects 17[56%] were in nuclear family, 13[43%] were in joint family in experimental group.
In control group majority of subjects 18[60%] were in nuclear family, 12[40%] were in joint family.

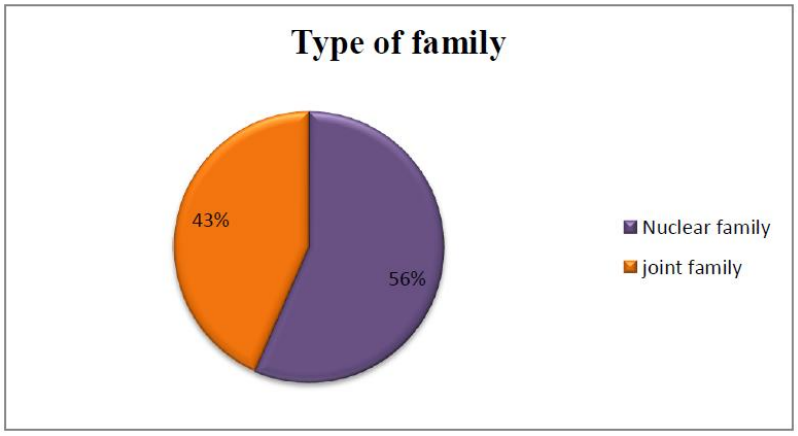

Figure 3(d): A bar diagram showing percentage distribution of type of family.

Table 5. Frequency and percentage distribution of samples according totype of Delivery

Type of delivery	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage8/
A) Normal Vaginal Delivery	10	33%	13	43%
B) Lower segment ceasarean section	20	67%	17	57%
C)Others	0	0%	0	0%

Table 5: The data presented in the table 5 depicts that type of delivery wise distribution which shows that the majority of subjects 20[67%] were delivered by lower segment cessarian section, 10[33%] were delivered by normal vaginal delivery, 0[0%] in others group in experimental group .
In control group majority of subjects 17[57%] were delivered by lower segment cessarian section, 13[43%] were delivered by normal vaginsl delivery,0[0%] were in others group.

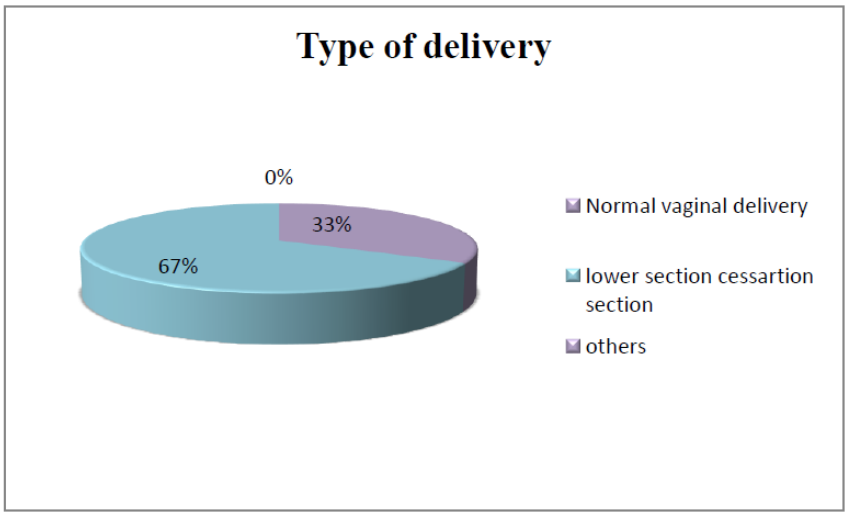

Figure 3(e): A bar diagram showing percentage distribution of type of delivery.

Table 6.Frequency and percentage distribution of samples according totype of Residential Area

Type of residential area	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) Rural area	19	64%	17	57%
B) Urban area	10	33%	11	37%
C)Slum area	1	3%	2	6%

Table 6: The data presented in the table 6 depicts that type of residential area wise distribution which shows that the 19[64%] were in rural area, 10[33%] were in urban area, 1[3%] were in slum area in experimental group. In control group majority of subjects 17[57%] were in rural area, 11[37%] were in urban area, 2[6%] were in slum area.

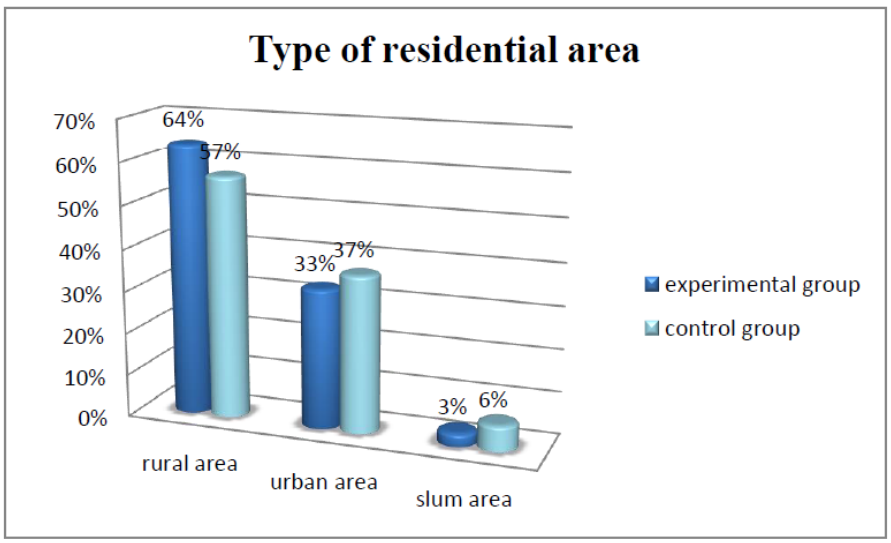

Figure 3(f): A bar diagram showing percentage distribution of type of residential area.

Table 7.Frequency and percentage distribution of samples according to Dietary Habit

Type of dietary habit	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) Vegetarian	9	30%	19	63%
B) Non-vegetarian	21	70%	11	37%

Table 7: The data presented the table 7 depicts that dietary habit wise distribution which shows that the majority of subjects 21[70%] were non-vegeterian, 9[30%] were vegeterian in experimental group. In control group majority of subjects 19[63%] were vegeterian, 11[37%] were non- vegeterian.

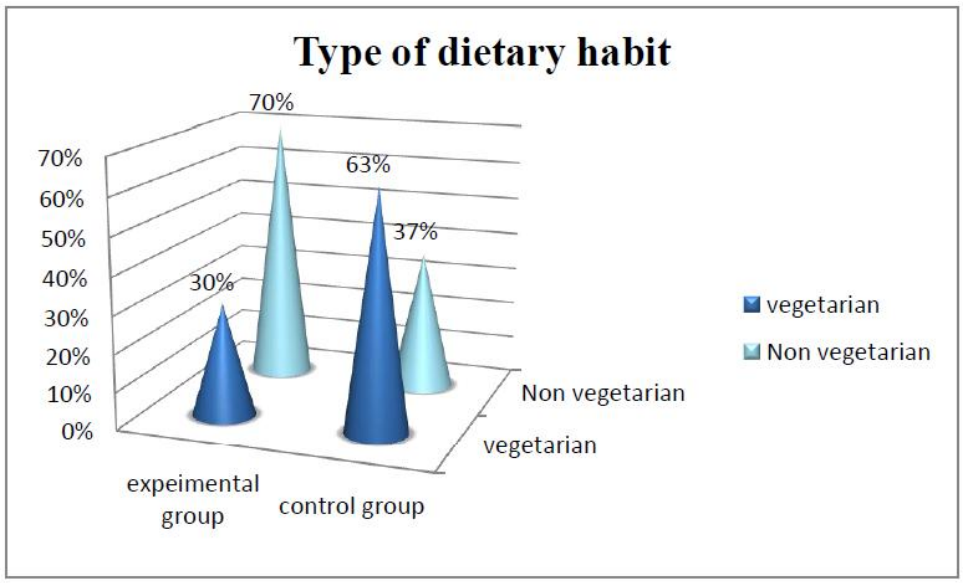

Figure 3(g): A bar diagram showing percentage distribution of type of dietary habit.

Table 8.Frequency and percentage distribution of samples according to Family Income

Family income	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
A) 3000-5000	6	20%	7	23%
B) 5001-7000	5	17%	11	37%
C)7001-9000	13	43%	6	20%
D)>90001	6	20%	6	20%

Table 8: The data presented in the table 8 depicts that family income in rupees wise distribution which shows that the majority of subjects 13[43%] were in category of 7001-9001, 6[20%] were in category of 3000-5000, 6[20%] were in category of >9000, 5[17%] were in category of 5001-7000 in experimental group. In control group majority of subjects 11[37%] were in category of 5001-7000, 7[23%] were in category of 3000-5000, 6[20%] were in category of 7001-9000, 6[20%] were in category of >9000.

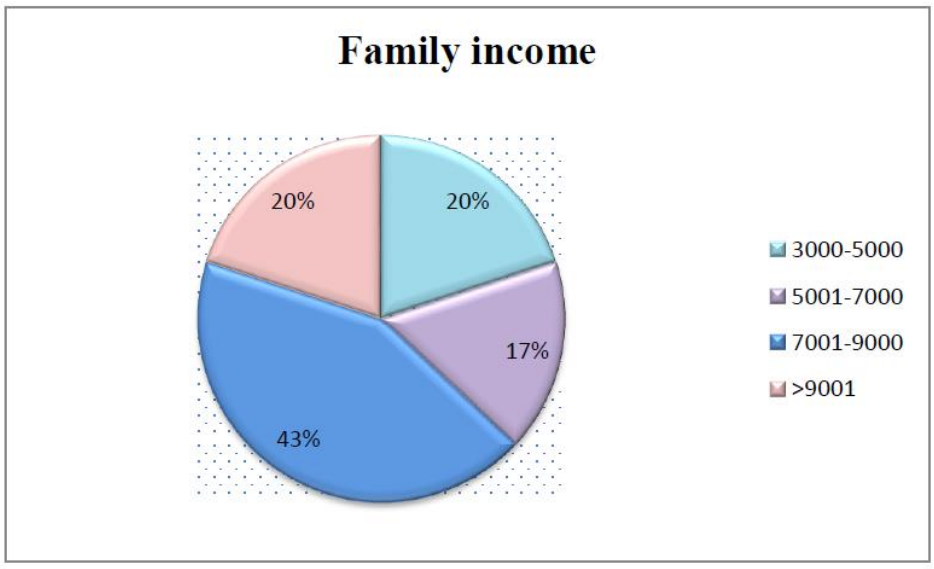

Figure 3(h): A bar diagram showing percentage distribution of family income.

SECTION-B

Table 1.Comparison of pre-interventional score in experimental and control group

PRE-INTERVENTION SCORE

Age in years	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Mild	0	0%	0	0%
Moderate	1	3.3%	0	0%
Severe	29	96.67%	30	100%

Table 1: The data presented in the table, that is pre-interventional score depicts that majority of subjects 29[96.67%%] were had severe breast engorgement, 1[3.3%%] were had moderate breast engorgement, 0[0%] were had mild breast engorgement. In control group majority of subjects 30[100%] were had severe breast engorgement, 0[0%] were had moderate breast engorgement,0[0%] were had mild breast engorgement.

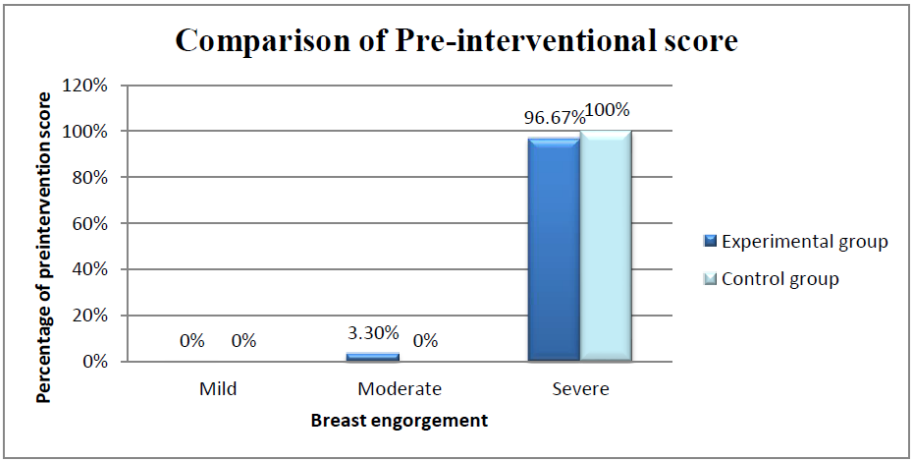

Figure 4: A bar diagram showing percentage distribution of comparison of pre-interventional score in experimental and control group.

SECTION-C:

Table 1.Comparison of postinterventional score in experimental and control group.

POST INTERVENTION SCORE

CRITERION	SCALE	Experimental group		Control group	
		F	%	F	%
MILD	1-2	27	90%	5	16.67%
MODERATE	3-4	3	10%	25	83.33%
SEVERE	5-6	0	0%	0	0%

Table 1 : The data presented in the table, that is pre-interventional score depicts majority of 27[90%] were had mild breast engorgement, 3[10%%] were had moderate breast engorgement, 0[0%] were had severe breast engorgement.

In control group majority of subjects 25[83.33%] were had moderate breast engorgement, 5[16.67%] were had mild breast engorgement,0[0%] were had severe breast engorgement.

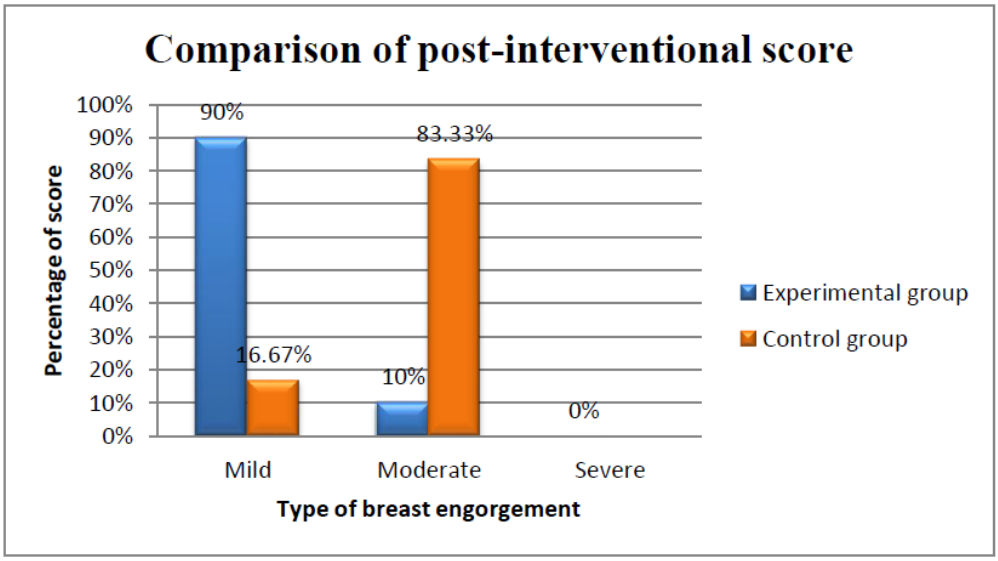

Figure 5: A bar diagram showing percentage distribution of post-interventional score.

SECTION-D :1. COMPARISON BETWEEN COLD CABBAGE APPLICATION THERAPY AND HOT APPLICATION THERAPY

Sr. No	Comparison		Chi Square	Df	T value
1	Pre Cold cabbage therapy	Pre Hot application therapy	1.0169	1	NS
2	Post cold cabbage therapy	Post Hot application therapy	32.4107*	1	S*
3	Pre Cold cabbage therapy	Post Hot application therapy	56.1538*	2	S*
4	Post Cold cabbage therapy	Pre Hot application therapy	60*	2	S*

NS = NON SIGNIFICANT
* = SIGNIFICANT

The data presented in the table 1 shows Hot application therapy the computed Chi-square value of Pre Hot application therapy and Pre Cold cabbage leaves therapy was (1.0619). This value was not found to be statistically significant at 0.05 level of significance. The Chi-square value of Post Hot application therapy and Post Cold cabbage leaves application therapy was (34.4107). This value was found to be statistically significant at 0.05 level of significance. The Chi-square value between Post Hot application therapy and Pre Cold cabbage leaves therapy was(56.1538). This value was found to be statistically significant at 0.05 level of significance. The Chi-square value of Pre Hot application Therapy and Post Cold cabbage leave application therapy was (60).This value was found to be highly significant at 0.05 level of significance which shows Hot application therapy cold cabbage therapy is more effective than Hot application therapy to relieve breast engorgement.
Significant change at $p<0.05$

IV. Discussion

In this section, investigators interpretively discuss the result of the study in the discussion. The researchers tied together all the loose ends of the present study in accordance with the objectives of the study.

Objective 1: The first objective of the study to assess the effectiveness of Cold cabbage therapy among postnatal mothers to relieve breast engorgement before providing cold cabbage therapy in experimental group.

The present study revealed Hot application therapy majority of subjects Hot application therapy is 29[96.7%] severe breast engorgement 1 [3.3%] moderate breast engorgement ,0 [0%] mild breast engorgement before intervention,

After intervention, majority of subjects 27 [90%] mild breast engorgement, 3 [10%] moderate breast engorgement ,0[0%] severe breast engorgement.

The result of present study was consistent with a study conducted by Ruba R (2009) to to assess the effectiveness of cabbage leaves application on breast engorgement among postnatal mothers. The study comprises of 24 mothers selected by using purposive sampling method. Pre-treatment level of breast engorgement is compared with post treatment level and found Hot application therapy application of cabbage leaves to relieve breast engorgement is very effective.

Objective 2: The second objective of the study to assess the effectiveness of Hot application therapy among postnatal mothers to relieve breast engorgement before providing Hot application therapy in control group.

The present study revealed Hot application therapy majority of subjects 30[100%] had severe breast engorgement, 0[0%] moderate breast engorgement, 0[0%] mild breast engorgement, before intervention.

After intervention the majority of the subjects 25[83.33%] had moderate breast engorgement, 5[16.67%] had mild breast engorgement, 0[0%] had severe breast engorgement after intervention.

The result of the study was consistent with a study conducted by Nanthini.R,Bhuvanewari (2013) to assess the effectiveness of cold cabbage leaves application versus hot application on breast engorgement. In the study out of 30 postnatal mothers have a curable breast engorgement by giving both cabbage leaf application and hot water application. The overall study was effective and curable.

This shows hot application therapy there was significant improvement in both cold cabbages leaves application and hot water application. The hot water application is more effective than cabbage leaves application.

Objective 3: The third objective is to compare the effectiveness of cold cabbage therapy versus hot application to relieve breast engorgement in selected PHC at Thiruvallur district

The present study revealed Hot application therapy majority of subjects 27[90%] had mild breast engorgement, 3[10%] had moderate breast engorgement, 0[0%] had severe breast engorgement in experimental group.

While In Control group majority of subjects 5[16.67%] had mild breast engorgement, 25[83.33%] had moderate breast engorgement, 0[0%] had severe breast engorgement. Hence according to our study result cold cabbage leave therapy is more effective to relieve breast engorgement as compare to hot application therapy.

The result of the study was consistent with a study conducted by Arora S, VastavaM, Dadhwal V (2014) to assess and compare the efficacy of cold cabbage leaves and hot applications in the treatment of breast engorgement. Then the study comprises of total 60 mothers 30 in experimental group and 30 in control group. The control group received cold cabbage leaf for relieving breast engorgement. Both the treatment Hot application therapy is, hot applications were effective in decreasing breast engorgement and pain in post-natal mother. Cold cabbage leaves are more effective in decreasing breast engorgement.

V. Conclusion

The finding indicates Hot application therapy there was significant difference between pre-intervention and post-intervention score. Both intervention cold cabbage leaves and hot application were effective in decreasing breast engorgement but according to result of our study cold cabbage leaves therapy is more effective than hot application therapy to relieve breast engorgement as evidenced by percentage distribution of pre-intervention score and post-intervention score.

Nursing implication:

1. The findings of the present study supports hot application therapy, cold cabbage leave therapy and hot application therapy is very safe, cost effective and is not harmful to health.
2. It is provided to be effective in non-pharmacological management to reduce the breast engorgement. The findings of the study have several implication for the following fields.

Implications for the nursing practice:

1. The findings of the study enlighten the fact hot application therapy cold cabbage leaves therapy can used to relieve breast engorgement among postnatal mothers.
2. The study findings help the nursing personnel include cold cabbage leave therapy as nursing intervention in the management of breast engorgement.
3. The nurse should contribute to the evidence based practice through the experienced gained from the application of cold cabbage leaves therapy while caring patient with breast engorgement.

Implications for nursing education:-

1. The effectiveness of cold cabbage leaves therapy in reducing breast engorgement is to be published in nursing journals to make awareness among postnatal mothers.
2. The result of this study can be used as example by the nurse educator in classroom, when giving instruction regarding the care of postnatal mothers with breast engorgement.
3. Nursing students can educate the postnatal mothers to use cold cabbage leaves therapy while suffering breast engorgement.
4. Nursing students can enhance their knowledge by including cold cabbage leaves therapy as a home remedy in the community health nursing textbooks.

Implications for nursing administration:-

Nurse administrator can instruct the staff nurse to encourage their postnatal mothers who are suffering from breast engorgement to use cold cabbage leave therapy.

Implication for nursing research:-

1. Nurse researcher has to conduct the research by comparing the cold cabbage leave therapy with others other complimentary therapies.
2. Nurse researcher has to conduct the study regarding the effectiveness of cold cabbage leave therapy in postnatal mothers who are suffering from breast engorgement.
3. Nurse researcher can do this study with the large sample size to generalize the findings.
4. Nurse researcher can do this study by comparing the cold cabbage leave therapy with other home remedies.

Limitations:-

1. The study limited to 60 sample size.
2. The study limited to selected PHC at Thiruvallur district

Recommendations:-

1. The study can be conducted on large sample to validate the findings of present study.
2.The study can be conducted in the multiple settings.

This study has helped to identify the aspects of care that has been neglected.This calls for more supervision and guidance for nurses to care for cancer patients.

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