



# “Effectiveness of Structured Teaching Programme on knowledge regarding preservation of human milk at home among working women’s in selected schools.”

**Shruti Kasar**<sup>1</sup> Student of Final Year Msc Nursing department of Obstetrical and Gynecological nursing, M.V.P.S’ Institute of Nursing Education Adgaon Nashik.

**Vanita Gaikwad**<sup>2</sup> Assistant Professor of department of Obstetrical and Gynecological nursing, M.V.P.S’ Institute of Nursing Education Adgaon Nashik.

**Sara Tomy**<sup>3</sup> Assistant Professor of Child Health Nursing, M.V.P.S’ Institute of Nursing Education Adgaon Nashik.

**Pournima Naik**<sup>4</sup> Principal of M.V.P.S’ I.N.E. Adgaon.

**Abstract :** Human breast milk provides infants with defensive factors against many illnesses. Infants who are breastfed appear to be less susceptible to certain infections than bottle-fed infants. There are many agents found in human milk that are important in imparting protection to infants; these agents include lysozymes, lactoperoxidase, lactoferrin, interferon, complement components, leukocytes, and immunoglobulins. These protective properties are particularly beneficial during the first few months of an infant’s life, when an effective immune response against foreign organisms cannot be mounted. Storage of human breast milk for limited periods of time is unavoidable in neonatal units and in many households, especially among working mothers who need to report back to work soon after delivery.

**Methodology:** In the present study, pre-experimental one group pre-test post-test research design was used. Total 60 working women’s sample were selected by Probability simple random sampling technique as per the inclusion criteria. Structured Knowledge Question was used in this study.

**Findings:** The comparisons of the pre-test and post-test means of the knowledge regarding preservation of human milk at home among working women’s in selected schools were done by the paired t test. The test was conducted at 5% level of significance. The pre-test average knowledge score was 13.98 with standard deviation of 2.93. The post-test average knowledge score was 27.45 with standard deviation of 1.78. The test statistics value of the paired t test was 29.32 with p value 0.00. The p value less than 0.05, hence reject the null hypothesis. That means there is significant difference in pre and post-test knowledge.

**Conclusion:** The findings of the present study indicated regarding preservation of human milk at home among working women’s, shows that knowledge on preservation of human milk at home is good among the selected working women’s of selected schools. It indicates that the structured teaching programme is effective in improving the knowledge level of working women’s of selected schools. It should be emphasis that having structured teaching programme with working women’s on preservation of human milk at home improves their knowledge.

## I. INTRODUCTION

**“While breast feeding may not seem the right choice for every parent, it is the best choice for every baby”**

**- Amy Spangler**

Breast feeding is a complex interaction between mother and infant that has enhanced or inhibited by wide range of social, psychological, and physiological factors. The first feed deserved special attention. In some societies, the first contact with food is traditionally an important ritual occasion. Breast feeding is a biological process that is highly influenced by various psychological and environmental factors such as education, occupation, family support and nutrition. The way in which breast feeding is initiated in the early postnatal period is an important process likely to continue for the growth of the infant. Breast milk provides the main source of nourishment in the first year of life. More affluent societies all over the globe, breast feeding appears to have become a lost art and feeding bottle has suppressed the breast feeding. A great asset in India is that an average Indian mothers although poor in nutritional status has a remarkable ability to breast feed her infant for prolonged period. Longitudinal studies indicated that poor Indian women secreted as much as 400-600 ml of milk per day during the first year. Breast feeding provides significant health benefits for infants and mothers.<sup>1</sup>

Human breast milk provides infants with defensive factors against many illnesses. Infants who are breastfed appear to be less susceptible to certain infections than bottle-fed infants. There are many agents found in human milk that are important in imparting protection to infants; these agents include lysozymes, lactoperoxidase, lactoferrin, interferon, complement components, leukocytes, and immunoglobulins.<sup>2</sup> These protective properties are particularly beneficial during the first few months of an infant's life, when an effective immune response against foreign organisms cannot be mounted. Storage of human breast milk for limited periods of time is unavoidable in neonatal units and in many households, especially among working mothers who need to report back to work soon after delivery.<sup>3</sup>

**La leche league international (2012)**, stated that mother's milk is a living substance so precious, it is also called as "white Blood" it is essential to store expressed milk properly to maximize its nutritional and anti-infective qualities. Human Milk has anti-bacterial properties that help to stay fresh. Giving the baby the fresh milk, the mother has bumped ensures its high quality.<sup>4</sup> Milk is the optimal food for almost all infants in the first year of life. The breast milk provides numerous health benefits to both mother and baby.<sup>5</sup> Milk is the primary source of nutrition for newborns; older infants and toddlers may continue to be breastfed, either exclusively or in combination with other foods from around six months of age when solid foods may be introduced.<sup>6</sup>

The American academic of pediatrics and the American college of obstetrics and gynecology has policy statement supporting breast feeding that reflect recent advancement in understanding the mechanism underlining the benefits of breast feeding and in the clinical management of breast feeding. Despite of popular belief that there are few contraindications to breast feeding, providing maternal support and structured antenatal and postpartum breast-feeding education are the most effective means of achieving breast feeding a success. In addition, immediate skin-skin contact between the mother and infant has shown to improve early initiation of breast-feeding outcomes.<sup>7</sup>

**BABY FRIENDLY HOSPITAL INITIATIVE (1992)**, United Nations Children's Fund and World Health Organization launched the baby friendly initiative amongst doctors, nurses, health workers and parents, in hospitals and maternity centers to promote, protect and support breast feeding. The object is to reestablish the superiority of breast feeding in order to protect the newborn's health by becoming baby friendly. To fulfill the initiative of UNICEF and WHO laid down ten steps to correct the baby friendly environment.<sup>8</sup>

The World Health Organization's definition of exclusive breastfeeding is that an infant receives only breast milk from its mother or expressed breast milk and no other liquid or solids except for drops of syrups consisting of vitamins, mineral supplements, or medicines. The practice of exclusive breastfeeding for six months is essential to the baby as well to the mother to promote maternal and child bonding.<sup>9</sup>

## BACKGROUND OF THE STUDY

Breast milk is best food for baby, which protects him against infections, helps him to grow and develop during first years of life. Breastfeeding can prevent a major section of neonatal mortality and morbidity. It is the fundamental right of every child.

Breastfeeding improves quality of life by nutritional, immunological, psychological, economic and child spacing benefits to both mother and the child. Breastfeeding should be started within one hour of birth, i.e., golden hour, irrespective of the mode of delivery.<sup>10</sup>

The first year of life is vital in laying the foundation of good health. At this time certain biological and psychological needs must be met to guarantee the survival and healthy development of the child into future adult.<sup>11</sup>

**Jessica et al., (2017)** Development of appropriate breastfeeding promotion interventions will help to achieve the Healthy People 2020 goals of increasing the ratio of mothers who breastfeed their infants. 82% of mothers breastfeeding in early postpartum period, 61% at six months and 34% at one year of age (U.S. Department of Health and Human Services [DHHS], 2011).<sup>12</sup>

**Kelsey et al., (2014)**, Every lactating mother is encouraged to exclusively breastfeed her infant from birth till six months of age, followed by continued breastfeeding with appropriate complementary food after 6 months of age up to two years or beyond (WHO). Though it's a natural process, breastfeeding success has many obstacles like breast engorgement, inadequate milk production, working mothers, Neonatal Intensive Care Unit admissions of neonates etc. Evidence-based research articles reported that the most common factors for termination of early breastfeeding were lack of paid maternal leave, maternal beliefs, and perceptions like inadequate breast milk and painful breastfeeding associated with incorrect infant position and latch.<sup>13</sup>

**Wiener and Wiener, (2011)**, The maternal characteristics such as age, income, education, knowledge, and ethnicity have been associated with the initiation and continuation of exclusive breast feeding<sup>14</sup>

**Murimi et al., (2010)**, The lack of support, encouragement, and education from healthcare professionals, family, and friends can become barriers to exclusive breastfeeding.<sup>15</sup>

**Jessy, (2016)** With growing urbanization and industrialization, more and more women have joined the work force. About 50% of women employed in the workplace are of reproductive age and return to work within one year of their infants' births. In India, increased female literacy rate to 65.46% according to 2011 census and rapid urbanization have increased the workforce participation rate of females in rural sector to 26.1% and to 13.8% in the urban sector.<sup>16</sup>

**Sarojamma C P (2008)**, conducted a study on effectiveness of teaching programme on knowledge and practice of expression breast milk among primi mothers. 179 mothers were selected by simple random sampling method. 16.8(30/179) had adequate Knowledge and 41.3% (74/179) had moderate adequate knowledge and 41.9% (75/179) had in adequate knowledge, the teaching program was highly effective at the level of  $p < 0.05$ .<sup>17</sup>

**P. Ester Mary (2017)**, conducted study on effectiveness of self-instructional module in knowledge on collection and storage of expressed breast milk among mothers of infants at selected children hospital in chennai in Pre-test out of 100 samples 15 were adequate Knowledge 35 were in Moderate Knowledge, 50 were inadequate knowledge. In Post-test out of 100 samples 65 were adequate Knowledge 25 were in Moderate Knowledge, 10 were in adequate Knowledge the pretest mean value is 10.62. with 24.81 standard deviation and posttest mean value is 25.96 with 0.98 standard deviation. Paired-t test reveals that there is effectiveness of self-instructional module in knowledge on collection and storage of breast milk among mothers of infants at the level of  $p < 0.05$ .<sup>18</sup>

## NEED FOR THE STUDY

Breast feed is the most natural feed and breast milk is the best milk. The basic food of infant is mother's milk. Since the breast milk is essential for the infant's health, the mother must continue the exclusive breast feeding. But in cases of working women, they can feed their child only when they are getting leisure time. One of the other methods through which the working women can manage their baby's health is through expressed breast milk. Expression of breast milk is beneficial to both the baby as well as the mother; it provides nutrition to the child and prevents breast complications also. Premature cessation of exclusive breast feeding and introduction of formula feed unnecessarily exposes children to the risk of infection and malnutrition. About 1.4 million deaths of child aged below two years are due to the sub optimal breast-feeding practices. 20% of neonatal death can be prevented by enacting exclusive breast feeding. World health Organization, American college of Pediatrics and American academy of pediatrics, and Gynecology, United states preventive service task force, all recommended feeding the baby for first six month only with breast milk. Mother working outside the home is one of the reasons for early weaning in 2005, 9% of women who got married and had a child of one year of age or younger returned to the work. Recent surveys show that the rate of working women increased up to 82%-86%. Lack of support and knowledge regarding management of breast feeding while employed, a non-supportive work environment, and problems of expressing breast milk are frequently given as reasons that working in easily.<sup>19</sup>

Breastfeeding has been identified as an important “upstream” intervention that affects the health and well-being of babies and their mothers. In India most of the mothers are unaware of expression and storage of breast milk, which leads to inadequate provision of mother’s milk to the baby resulting in decreased health status of the child as the mother returns to work. So, it is very important to give education to the working mothers regarding storage and expression of breast milk.<sup>20</sup>

**Rajeesh C.H et al., (2018)**, conducted a study to assess the knowledge and attitude of post-natal lactating mothers regarding human milk banking. Only 6.7% mothers had heard about human milk banks. Only 17.3% mothers and 3 mothers among the 15 NICU babies think that a human milk bank is required. In our study we concluded that most mothers were unaware about the concept of human milk banking and were reluctant to neither donate nor accept breast milk. The major reason for this is the lack of knowledge about the importance of human milk.<sup>21</sup>

Breast milk is important for low birth weight and sick newborns. They require biochemical and protective factors present in mother’s milk. However, the mothers of these babies have lactation problems and may find it difficult to keep up their breast milk supply. The factors responsible for this include perinatal stress, anxiety, and separation from baby due to work. Breast milk contains different anti-infective factors like lactoferrin and high level of bifid us factors which protect the baby from infections, viable phagocytic, macrophage, lymphoid cells.<sup>22</sup>

The active fat lipase in the breast milk promotes digestion of fat and provides free fatty acids. Numerous studies have shown that breast feeding between six months and two years of age has been decreased incidence of allergic disease, bacterial meningitis, bacteremia, diarrhea, respiratory tract infection, necrotizing enterocolitis, otitis media, urinary tract infection, late onset sepsis in preterm babies, lymphoma, leukemia, Hodgkin’s disease, hypercholesterolemia, asthma, and post neonatal infant mortality.<sup>23</sup>

Around 1970 there was loss of interest towards milk bank. The reason for this loss of interest was the heavy promotion of infant formula, including formulas specially designed for preterm infants. Later, a fear of transmission of viruses, including HIV, in body fluids led to an anxiety about donation of body fluids, including breast milk. 15WHO and UNICEF, made a joint statement in 1980, “Where it is not possible for the biological mother to breastfeed, the first alternative, if available, should be the use of human milk from other sources”.<sup>24</sup>

Antibodies that are in breast milk are not in cow’s milk/formula and cannot be artificially produced. The amount of protein in cow’s milk/formula is double the amount in breast milk and is also a different and less digestible type. Cow’s milk/ formula has smaller amounts of carbohydrates than breast milk. The fat in cow’s milk/formula is very different than the fat in breast milk and digestibility is poor. Tetany, late onset metabolic acidosis, milk allergy, iron deficiency anemia, dental caries, Zn and Copper deficiency are diseases related commonly to the cow’s milk feeding.<sup>25</sup>

**Robert (2009)**, conducted a study on assess the level of knowledge on collection and storage of breast milk among working mothers of infants. He concluded that the maximum number of mothers 70% were not having adequate amount of knowledge regarding the collection and storage of breast milk. He also recommended that the best practices of collection and storage of breast milk. It should not exceed 24 hours in refrigerator temperature (4 to 10° c) 8 hours at room temperature (15-27°c) and 4 hours at room temperature (30-38°c).<sup>26</sup>

In view of the above facts & interest the researcher felt the need to use structured teaching programme to assess the knowledge regarding preservation of human milk at home among working women’s and ensure their understanding so that they are able to perform this at their own level.

### **TITLE OF THE STUDY**

“Effectiveness of Structured Teaching Programme on knowledge regarding preservation of human milk at home among working women’s in selected schools.”

### **OBJECTIVES OF THE STUDY**

#### **Primary objectives-**

1. To assess the knowledge regarding preservation of human milk at home among working women’s in selected schools.

#### **Secondary objectives-**

1. To assess the effectiveness of structured teaching programme regarding preservation of human milk at home among working women's in selected schools.
2. To find out the association between knowledge score regarding preservation of human milk at home among working women's with selected socio demographic variables.

#### **HYPOTHESIS-**

1.  $H_0$  - There will be no significant association between pre and post-test knowledge score of working women's on preservation of human milk at home with selected demographic variable.
2.  $H_1$  – There will be significant association between pre and post-test knowledge score of working women's on preservation of human milk at home with selected demographic variable.

#### **OPERATIONAL DEFINITIONS-**

##### **EFFECTIVENESS**

According to Oxford dictionary "effectiveness refers to the fact of producing the result that is wanted or intended; the fact of producing a successful result".<sup>27</sup>

In this study it refers to the extent to the outcome of structured teaching programme on preservation of human milk at home in working women's.

##### **STRUCTURED TEACHING PROGRAMME**

According to Collins dictionary "It refers to the systematically developed instructional programme using instructional aids, designed to provide information."<sup>28</sup>

In this study it refers to the educational program designed to impart knowledge regarding preservation of human milk at home among working women's.

##### **KNOWLEDGE**

According to Oxford dictionary, "knowledge is referring to the information, understanding and skills that you gain through education or experience."<sup>29</sup>

In this study, it refers to estimation of level of understanding of women's preservation of human milk at home among working women's.

##### **PRESERVATION**

According to Oxford dictionary, it refers to preserve something to keep a particular quality, feature, etc.; to make sure that something is kept.<sup>30</sup>

In this study, it refers to storing human milk at home setting in order to provide milk which is free from damage to decay.

##### **HUMAN MILK**

According to Oxford dictionary it refers to the liquid food secreted by female mammals from the mammary gland.<sup>31</sup>

In this study, it refers to a milk which is produced by a mother after delivering a baby.

##### **WORKING WOMEN**

According to Collins English dictionary, it refers to a women who is regularly employed.<sup>32</sup>

In this study it refers to a women who is working outside the home.

#### **SCOPE OF THE STUDY:**

1. The study will find out the knowledge of preservation of human milk at home among working women's.
2. The study would be help the respondents to know the level of knowledge that they possess regarding preservation of human milk at home.
3. The study will be helpful to bring awareness among working women's about techniques of preservation of human milk at home.

## LIMITATIONS

1. The findings of the study was restricted to the respondents under the study, only from selected schools.
2. The study was restricted to only working women.
3. The study was limited to time duration.

## ETHICAL ASPECTS

The ethical issue was addressed by taking institutional ethical committee approval for ethical consideration. Permission to conduct research study was obtained from concerned authorities of selected schools, written consent was taken working women's taken for their willingness to participate in the study. The confidentiality of the data was maintained. No harm or injustice was done while dealing with the samples and the data.

## CONCEPTUAL FRAMEWORK

**According to Florence Nightingale Environmental Theory (1859)**, the concept of nursing is to change the patient's environment to maintain his or her health. The environment can be physical, psychological, and social.

This study is focused on assessing the effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women's. Environmental adaptation model by Florence Nightingale is used for the present study. As the present study has the structured teaching programme, it satisfies all the necessary reasons to adopt the Environmental adaptation model.

This theory represents as expansion of Florence's original ideas to concepts of maintain the environment of patient.<sup>33</sup>

### Concept

This theory represents the essential components which are vital for a health of individual are pure air, pure water, efficient drainage, cleanliness and light.

- **Ventilation and warming:** Nightingale stressed on the importance of keeping optimum temperature.

In this study, the researcher perceives that, while preserving milk, women should maintain the optimum temperature of refrigerator.

- **Cleanliness:** Nightingale considered that poor living condition and personal hygiene are the main source of infection. Interventions pertains to this aspects are proper storage.

In this study, researcher provided structured teaching programme regarding preservation, maintaining clean infant feeding items and pumping equipment.

- **Nutrition:** Nightingale noted people interest towards food is unique and varies at different times of the day.

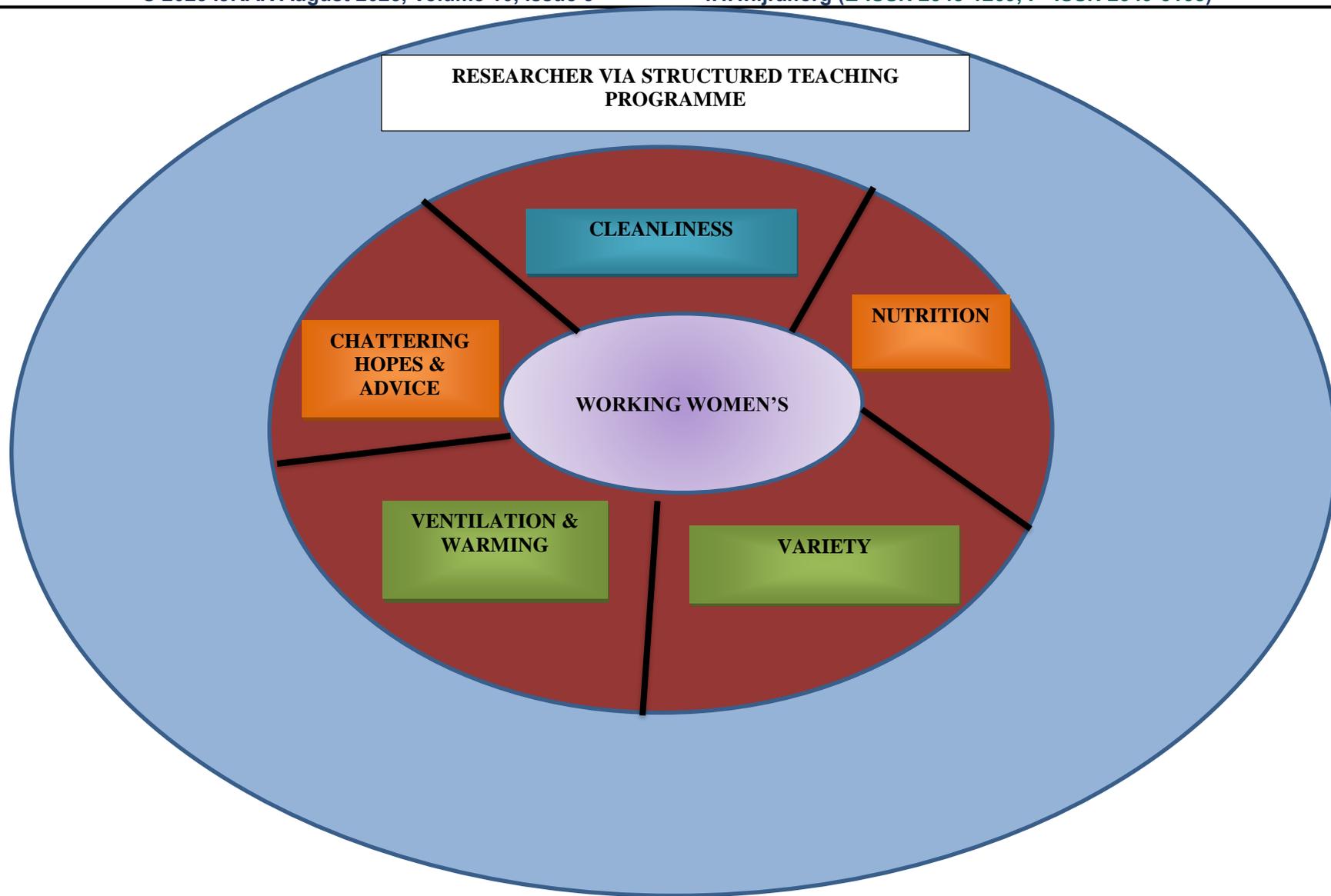
In this study, researcher provided knowledge to maintain small & frequent feeding schedule.

- **Variety:** Nightingale noted and considered changes in the room are very essential to keep the patient active and fresh.

In this study, researcher provided knowledge regarding preservation of human milk at home.

- **Chattering Hopes & Advices:** Nightingale perceives that false reassurance on the illness should be avoided and sick person need to hear the good news which will assist him to be healthier.

In this study, researcher educated about stored breast milk for working women's will help meet a baby's nutritional need.



**FIGURE NO. I. (1) CONCEPTUAL FRAMEWORK BASED ON FLORANCE NIGHTINGALE ENVIRONMENTAL THEORY**

## SUMMARY

This chapter dealt with the introduction, background of the study, need of the study, title of the study, objectives, hypothesis, operational definitions, scope of the study, limitations, ethical aspects and conceptual framework. The structured teaching programme was used as teaching strategy to educate the working women's regarding preservation of human milk at home.

## CHAPTER II

### REVIEW OF LITERATURE

The purpose of literature review is to discover what has previously been done about the problems to the studied, what remains to, what methods have been employed in other research and how the result of other research in the area can be combined to develop knowledge.

A literature review helps to lay the foundation for a study, and can also inspire new research ideas. In this study the literature was collected extensively and organized under the following headings.

- I. Review of literature related to breast feeding and its importance.
- II. Review of literature related to expression of breast milk.
- III. Review of literature related to storage of breast milk.

#### I. Review Of Literature Related to Breast Feeding and its importance.

**Preeti Malhotra et al. (2017)**, conducted a prospective study to assess knowledge, attitude, and breast-feeding practices of working mothers in Punjab, India. 1000 mothers were selected by purposive sampling technique. The study results revealed that some (38%) of the mothers had prior knowledge regarding importance of Colostrum, where as 67.2% were not aware of it. 42% mothers had knowledge about importance of breastfeeding while rest 58 said breastfeeding was not important. It was concluded that mothers have an average knowledge about breastfeeding and poor breastfeeding practices were followed. Thus, it is important to educate mothers and families regarding breastfeeding and its importance, we need to strengthen public health education system to promote breastfeeding.<sup>34</sup>

**Thenisha. A. (2017)**, conducted a cross sectional study among working and non-working breastfeeding practices was attempted. This was the institutional based study carried out in Vijaya Hospital, a maternity care hospital at Thiruvallur District. A convenient sampling was carried out. Among the total sample size of 172, 60 were working mothers and 112 were non-working mothers. A structured questionnaire was given to them and the data obtained was subjected to the analysis The results were given as descriptive statistics and a Proportionality test was carried out. Nearly 65% of working women practices pre lacteal feed and 70% of working women practices formula milk. Nearly 41.7% of working women had experienced breast pain which may due to delay in breast feeding depending on their burden of work. Nearly 51.7% of infants of working women had cough, 35% of infants had cold, 11.7% of infants had fever respectively. After performing Proportionality tests, the results are the practices among working and non-working women relating to pre lacteal feeds, colostrum and formula milk are not same. Therefore, this study has brought out the breast-feeding practices among working and non-working women which is mainly due to the burden of work that working women and its impact over the health of their infants. The increased burden of employment is the main reason of the difference in the breastfeeding practices among working and non-working women. This study has brought into light and educate the mothers about the benefits of breast feeding for baby.<sup>35</sup>

**Ms. Kavita Rawat et. al. (2019)**, conducted a study to evaluate the effectiveness of a structured teaching program on exclusive breastfeeding in terms of knowledge and practice among primi caesarean mothers in St. Stephens's hospital Delhi. Experimental research approach with pre-test post-test control group design was adopted. The population comprised of primi caesarean mothers admitted in the maternity unit of St. Stephens Hospital, Tis Hazari Delhi. The independent variable was structured teaching program and dependent variables were knowledge and practice of primi caesarean mothers. The tools used were structured knowledge questionnaire, observation checklist and structured opinionnaire. The KR-20, inter-observer and cronbach alpha formula was used to assess the reliability of tools. Primi caesarean mothers had poor knowledge and practice on exclusive breastfeeding. The structured teaching program was found to be effective in improving the knowledge and practice of primi caesarean mothers on exclusive breastfeeding. There was no significant association between the knowledge and practice with the selected variables i.e.,

age in years, religion, education, occupation, gender of the baby, gestation, type of family, previous exposure to health education on exclusive breastfeeding, initiation of breastfeeding and type of caesarean section. The structured teaching programme was effective to increase the knowledge and practice of the primi caesarean mothers on exclusive breastfeeding.<sup>36</sup>

**MEENU et. al. (2020)**, conducted a study to assess the effectiveness of structured teaching program on knowledge regarding exclusive breastfeeding among primi antenatal mothers in gims hospital, greater noida A quantitative research approach was used for the study to assess the effectiveness of structured teaching program on exclusive breast feeding among primi antenatal mothers in selected hospital in greater Noida. The study was conducted in GIMS hospital, Greater Noida. Non probability sampling technique is used to collect the study object. Data was collected from 60 primi antenatal mothers by using socio demographic data and structured knowledge. Result: The mean posttest knowledge score ( $23.00 \pm 3.464$ ) was greater than mean pretest knowledge score ( $18.03 \pm 5.170$ ). It was Found there is significant association between education of mother, occupation of mother, previous exposure to teaching and preexisting knowledge score. Conclusion: It was concluded that structured teaching program was effective and had more impact on primi antenatal mothers regarding exclusive breast feeding. This knowledge will help them to improve the practice of exclusive breast feeding.<sup>37</sup>

**The American Academy of Pediatrics (2012)**, Breastfeeding and human milk are the normative standards for infant feeding and nutrition. Given the documented short- and long-term medical and neurodevelopmental advantages of breastfeeding, infant nutrition should be considered a public health issue and not only a lifestyle choice. The American academy of pediatrics reaffirms its recommendation of exclusive breastfeeding for about 6 months, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant. Medical contraindications to breastfeeding are rare. Infant growth should be monitored with the World Health Organization (WHO) Growth Curve Standards to avoid mislabeling infants as underweight or failing to thrive. Hospital routines to encourage and support the initiation and sustaining of exclusive breastfeeding should be based on the American Academy of Pediatrics-endorsed WHO/UNICEF "Ten Steps to Successful Breastfeeding." National strategies supported by the US Surgeon General's Call to Action, the Centers for Disease Control and Prevention, and The Joint Commission are involved to facilitate breastfeeding practices in US hospitals and communities. Pediatricians play a critical role in their practices and communities as advocates of breastfeeding and thus should be knowledgeable about the health risks of not breastfeeding, the economic benefits to society of breastfeeding, and the techniques for managing and supporting the breastfeeding dyad. The "Business Case for Breastfeeding" details how mothers can maintain lactation in the workplace and the benefits to employers who facilitate this practice.<sup>38</sup>

**Geraghty SR., et. al. (2012)**, conducted a retrospective cohort study in Newyork about expressed human milk storage. 40 mothers were selected and their babies were fed by expressed human milk. The results showed that more mothers were benefited by expressed breast milk because of the production and consumption of the breast milk was accurate. The study concluded that the babies born to mothers who used expressed breast milk were healthy since the amount of consumption is measured.<sup>39</sup>

**Yilmaz E et al. (2017)**, conducted a cross-sectional study on the Early initiation and exclusive breastfeeding: Factors influencing the attitudes of mothers who gave birth in a baby-friendly hospital. The study was conducted with 350 mothers. Demographic characteristics, obstetric history and information about breastfeeding initiation were collected at the hospital. Information about factors affecting breastfeeding duration and feeding practices of the infants were obtained at the end of six months. Some 80.4% of the mothers-initiated breastfeeding, 60.1% within the first hour. Exclusive breastfeeding was maintained for six months in 38.9%. Efforts to encourage mothers and society to breastfeed exclusively should be made as part of a primary public health strategy to prevent early cessation of breastfeeding.<sup>40</sup>

**Davidson et al., (2012)**, During the first six months postpartum, breast milk requires no additional fluid or vitamin supplementation besides vitamin D and iron. Although the amount of breast milk that is ingested by breastfed infants is difficult to be determined, nutritional intake is considered more important than the quantity when it comes to the nutritional health of a newborn. Nutritional intake is considered adequate when the newborn gains 20 to 30 grams per day. When breast-feeding it is assumed that babies have ingested an adequate amount of breast milk in accordance to their stomach size based on the cessation of crying and decreased agitation that is typically triggered by hunger. However, studies have shown that almost all babies require calorie intake of 95 to 130 kcal/kg/day. Whether breast or bottle fed, it is accepted that feeding regimens are established based on an infant's weight, age, developmental stage, and stomach capacity.<sup>41</sup>

**Nemours et. al (2015)**, another benefit to breastmilk is that infants can digest breast milk more easily than formula. Breast milk is made up of “protein (whey and casein), fat and lactose” which are easily digested by a newborn’s underdeveloped GI tract whereas the components of formula are not. Breastfeeding also promotes the use of kangaroo care, which is the time in which the mother and baby’s skin come into contact for a specified period. “Skin-to-skin contact” between mother and infant creates an emotional and spiritual bond.<sup>42</sup>

**La Leche League et, al. (2014)**, there is a mechanism within a woman’s breasts that utilizes something called the let-down reflex to produce breast milk as the newborn demands. These demands by the newborn are recognized by mother’s breasts and body in the form suckling of the breasts by the newborn. As the infant suckles on the breasts sensors within the breasts are triggered to send messages to the brain. The brain interprets these messages as a demand for more milk to be released and so the brain sends hormones to the breasts which trigger the lobules or breast milk producing centers to produce more milk. The more often the newborn suckles on the mother’s breasts the greater the amount of milk that the breasts will produce.<sup>43</sup>

**McCall, (2014)**, a few reasons behind the negative view of breastfeeding in public is mainly because breastfeeding has become unfamiliar to many people since women began to work during the world wars and since bottle-feeding began to become the norm. Another factor that affected this change was the increased marketing of the human body and especially the use of breasts as a marketing tool among manufactures of certain products. Therefore, society began to see breasts within publicly not for their biological use but for their sexual association related to beer and car marketing. However, despite conflicting views, laws tend to air on the side of the mother and therefore one may be hopeful that the public awkwardness experienced related to breastfeeding in the current day will precipitate in time.<sup>44</sup>

**American Pregnancy Association, (2014)**, the benefits of breastfeeding for society, include that breastfeeding is ecofriendly, time-saving, and cost-efficient because the infant feeds exclusively from the breast. The mother will not need to buy bottles, formula, nipples, or breast pumps in order to feed her baby. Also, artificial formula preparation involves expenditures in several other areas. Depending on the brand, formula alone can cost between \$58 and \$198 per month.<sup>45</sup>

**United States Breastfeeding Committee, (2013)**, employees benefit from breastfeeding as an investment. Employees who provide lactation support 14benefit in the long run from lower health care costs, absenteeism, improved morale, turnover rates, job satisfaction, and productivity. Additionally, employee who support breastfeeding have a 94 percent retention rate while the national average was 59 percent. Breastfeeding saves dollars and makes sense: Help "make change" for our nation's families. Retrieved from breastfeeding will decrease dependence on taxpayer dollars by mothers who are uninsured. This will therefore lessen the strain on society as well as out-of-pocket spenders. In 2013 it was speculated that if 90 percent of mothers had decided to breast feed their infants exclusively for six months it would have saved the United States about \$13 billion and prevented the death of 911 individuals annually. About \$733.7 million was spent on direct health care that year while \$126.1 million was spent on indirect costs.<sup>46</sup>

**Subin, MJ.et.al, (2013)**, Were conclude breast milk is the natural food for babies. Good nutrition forms the basis for good health of a child. Breast feeding is an unequalled way of providing ideal food for the healthy growth and development of infants. An adequate supply of human breast milk provides all the nutrients the infants need for the first six months life. Early initiation of breast feeding in the first hour after birth and exclusive breastfeeding for the first six months after birth can prevent most neonatal and infant deaths in India.<sup>47</sup>

**Ystrom, E. (2012)**, conducted a study was stated neonatal anxiety and depression and breastfeeding cessation are significant public health problems. There is an association between maternal symptoms of anxiety and depression and early breastfeeding cessation. In earlier studies, the causality of this association was interpreted both ways; symptoms of anxiety and depression pre partum significantly impacts breastfeeding, and breastfeeding cessation significantly impacts symptoms of anxiety and depression. First, we aimed to investigate whether breastfeeding cessation is related to an increase in symptoms of anxiety and depression from pregnancy to six months postpartum. Second, we also investigated whether the proposed symptom increase after breastfeeding cessation was disproportionately high for those women already suffering from high levels of anxiety and depression during pregnancy.<sup>48</sup>

**Dr. Sam Oddie, (2013)**, was conducted study told Only 62 cases from May 2009 to June 2010, a prevalence of seven in every 100,000 live births. Disease in childhood and seen exclusively by the Guardian, they write that all the babies were admitted to hospital, mostly because of weight loss, and some were intravenously fed. However, all were discharged within two days to two weeks having gained weight and none had long-term damage. The evidence should reassure parents but the 11 researchers stressed it should also encourage them to seek help when struggling to establish breastfeeding. There are also milder cases of problems where babies are not feeding properly. In England, only 20% of hospital maternity units (accounting for nearly 22% of births) are BFI-accredited by UNICEF, compared with 70% in Scotland, 60% in Northern Ireland and 40% in Wales. But problems can anyway arise once the baby goes home, because visits from midwives and then health visitors are not as common as they were.<sup>49</sup>

**Shetty B. et.al, (2013)**, conducted an observational study of factors promoting breastfeeding in nursing mothers and pregnant women among 300 pregnant mothers. 36% had primary education and 12% were graduates. Majority (61%) lived in a joint family. Only 52.3% of the subjects received advice on breastfeeding during antenatal visits, out of which only 19.3% had a breast examination. 58.7% knew that breastfeeding should be initiated within 1 hour of child birth but only 48% of the mothers who had delivered initiated breastfeeding within 1 hour. 71.6% of the mothers knew that exclusive breastfeeding should be practiced for 6 months. This study conducted that is emphasizes the need to counsel mothers regarding breastfeeding practices early during antenatal visits and not postpone till after delivery, include the spouse for support, sensitize the health care giver and improve infrastructure for a successful breastfeeding initiation.<sup>50</sup>

## II. Review of literature related to expression of breast milk.

**Sinhababu A. et al., (2017)**, Conducted a cross-over study to investigate whether breast pumping using a hospital-grade electric pump was more effective in maximizing the available milk volume and more comfortable than manual expression in the first 48 hours after birth. Eleven women whose infants were admitted to the neonatal intensive care unit were sequentially allocated to either manual or electric breast expression for their first expression after 6 hours following birth. The women then used the other method for the next expression, and continued to alternate between methods until seven sessions had been completed for each method. Main outcome measure was volume of milk expressed per session. They concluded in the early postpartum period, the best way to obtain Colostrum's is by gentle manual expression.<sup>51</sup>

**Jane Emily Beatrice et. al. (2019)**, conducted a study on effectiveness of simulation-based teaching on manual expression of breast milk among mothers of babies admitted in the neonatal unit, South India feeding sick new born with breast milk is challenging. Mothers of sick infants must express breast milk until their infants are able to feed directly from the breast. Therefore, it is very important to teach the mothers whose babies are admitted in the neonatal unit about the correct method of manual expression of breast milk. Marmet hand expression technique requires practice, skill, and co-ordination. Hence, appropriate teaching method and content is much needed to educate and train the postnatal mothers. The study aims to determine the effectiveness of simulation-based teaching on the manual expression of breast milk. A quasi-experimental research design was undertaken for 6 weeks. Seventy mothers were selected using simple random sampling technique. A knowledge questionnaire and an observational checklist were used to collect data on knowledge and practice from mothers on the Marmet technique of milk expression. Data were collected for the control group with routine teaching in the nursery for the first 3 weeks and the next 3 weeks for the experimental group with simulation-based teaching. Pre-test assessment was made for both groups. Post-test assessment for knowledge was made after 72 h of the teaching. Post-test assessment for practice was made at 24, 48, and 72 h of teaching. The study revealed that there was a statistically significant increase in the knowledge and practice of mothers on the manual expression of breast milk ( $P < 0.001$ ) in the experimental group. This study identified that simulation-based teaching was an effective teaching tool. Knowledge gained through this research will be used to implement the simulation-based teaching for educating the postnatal mothers on manual expression of breast milk in the Neonatal unit.<sup>52</sup>

**Mayla S Borges (2017)**, conducted a retrospective, analytical, and observational study, performed by assessing titratable acidity records and the microbiological culture of 100 human milk samples expressed at home and at a human milk bank, in 2014. For the statistical analysis, generalized estimating equations (GEE) and the chi-squared test were used. When comparing the two sample groups, no significant difference was found, with 98% and 94% of the samples being approved among those collected at the milk bank and at home, respectively. No main interaction effect between local and titratable acidity records ( $p=0.285$ ) was observed, and

there was no statistically significant difference between the expected and observed values for the association between the collection place and the microbiological culture results ( $p=0.307$ ). The quality of human milk expressed at home and at the milk bank agree with the recommended standards, confirming that the expression of human milk at home is as safe as expression at the human milk bank, provided that the established hygiene, conservation, storage, and transport standards are followed.<sup>53</sup>

**E Larson. (2020)**, conducted a study on storage of human breast milk. The bacteriologic content of expressed breast milk was studied in 30 mothers at the time of expression and after 24 and 48 hours of refrigeration. There were no significant differences in colony counts between the three-time intervals. All samples contained *Staphylococcus epidermidis*. In addition, eight other species were found, including four which were gram-negative. All samples contained less than 10(6) colonies/ml, and there were no significant differences in mean colony counts between samples expressed at home and at the hospital. We conclude that it is bacteriologically safe to refrigerate expressed breast milk for up to 48 hours.<sup>54</sup>

**Frances Biagioli (2016)**, returning to work while breastfeeding. Mothers who work outside the home initiate breastfeeding at the same rate as mothers who stay at home. However, the breastfeeding continuance rate declines sharply in mothers who return to work. While the work environment may be less than ideal for the breastfeeding mother, obstacles can be overcome. Available breast pump types include manual pumps, battery-powered pumps, electric diaphragm pumps, electric piston pumps, and hospital-grade electric piston pumps. Electric piston pumps may be the most suitable type for mothers who work outside the home for more than 20 hours per week; however, when a mother is highly motivated, any pump type can be successful in any situation. Conservative estimates suggest that breast milk can be stored at room temperature for eight hours, refrigerated for up to eight days, and frozen for many months. A breastfeeding plan can help the working mother anticipate logistic problems and devise a practical pumping schedule. A mother's milk production usually is well established by the time her infant is four weeks old; it is best to delay a return to work until at least that time, and longer if possible.<sup>55</sup>

**Aleksandra Wesolowska (2019)**, human milk not only contains all nutritional elements that an infant requires, but is also the source of components whose regulatory role was confirmed by demonstrating health-related deficiencies in formula-fed children. A human milk diet is especially important for premature babies in the neonatal intensive care unit (NICU). In cases where breastfeeding is not possible and the mother's own milk is insufficient in volume, the most preferred food is pasteurized donor milk. The number of human milk banks has increased recently but their technical infrastructure is continuously developing. Heat treatment at a low temperature and long time, also known as holder pasteurization ( $62.5^{\circ}\text{C}$ , 30 min), is the most widespread method of human milk processing, whose effects on the quality of donor milk is well documented. Holder pasteurization destroys vegetative forms of bacteria and most viruses including human immunodeficiency virus (HIV) herpes and cytomegalovirus (CMV). The macronutrients remain relatively intact but various beneficial components are destroyed completely or compromised. Enzymes and immune cells are the most heat sensitive elements. The bactericidal capacity of heat-pasteurized milk is lower than that of untreated milk. The aim of the study was for a comprehensive comparison of currently tested methods of improving the preservation stage. Innovative techniques of milk processing should minimize the risk of milk-borne infections and preserve the bioactivity of this complex biological fluid better than the holder method. In the present paper, the most promising thermal pasteurization condition ( $72\text{C}-75\text{C}$ .) and a few non-thermal processes were discussed (high pressure processing, microwave irradiation). This narrative review presents an overview of methods of human milk preservation that have been explored to improve the safety and quality of donor milk.<sup>56</sup>

**Ms. Roshani Pareshkumar Naik (2020)**, conducted a study to assess the knowledge and attitude regarding human milk donation among postnatal mother in selected hospitals of pune city The finding of the study reveals that majority of 46% postnatal mothers were from under the age group of 23-26 years, mothers do not have previous knowledge about human breast milk donation. Present study shows that Mean knowledge score of the postnatal mothers regarding Human milk donation shows 8.89 with 3.06 Standard deviation. Result shows that mean attitude score of the post- natal mothers regarding Human milk donation shows 28.56 with 9.62 Standard deviation. co- relation between knowledge and attitude regarding human milk donation was negative co There is no significant association between knowledge regarding human milk and donation demographic variable Age (Years), education, type of Family, occupation, family Income per month and area of residence at 0.05 level of significance. Therefor the  $H_0$  has accepted. there is no significant association between attitude score of mothers regarding human milk and donation demographic variable Age (Years), Education, type of family, occupation, family income per month and area of residence at 0.05 level of significance. Therefor

the ho<sub>2</sub> hypothesis has accepted. The knowledge of postnatal mothers regarding breast milk donation was average nearly poor level. The attitude of postnatal mother is almost divided in to highly favorable, moderately favorable, unfavorable. Knowledge and attitude has no co relation in this study.<sup>57</sup>

**Doshmangir et. al. (2019)**, conducted a descriptive study to assess the characteristics of donation behavior and identify reasons, beliefs and feelings to donation of breast milk with women donors at two breast-milk banks. Data collection done on 36 samples with aged 14 to 33 years with different levels of schooling. 58.3% of subjects participated were first-time mothers. Data was collected thorough interviews conducted out during home visits. The study concluded that, the most frequently reported reasons for donating breast milk were altruism and excess milk production.<sup>58</sup>

**Knechukwu K. Iloh (2018)**, conducted a study perception of donor breast milk and determinants of its acceptability among mother sin a developing community: a cross-sectional multi-center study in south-east Nigeria. This study was cross-sectional multi-center study enrolled mothers attending antenatal or pediatric clinics. The result was adequate knowledge of the concept of donor milk, preference of donor milk to infant formula and requirement of financial remuneration were the only significant predictors of willingness to donate and/or receive donated breast milk.<sup>59</sup>

**Coutsoudis et. al., (2011)**, conducted an observational longitudinal to assess the feasibility of providing donor breast milk to infants after pasteurizations. 191 low birth weight infants were selected for the study, out of them 96 infants received their own mother's milk. Other 95 infants who were potentially eligible to receive donor milk, only 40 did in fact receive donor milk. Above study reported that it is feasible to supply donor milk to and there was no evidence of bacterial contamination in the samples analyzed, and no adverse events from feeding with donor breast milk.<sup>60</sup>

**Safeena Beevi et. al. (2021)**, conducted a study to assessment of knowledge regarding human breast milk bank among the nursing officers in JIPMER puducherry A total of 176 nursing officers were recruited as per eligibility criteria. Regarding the socio-demographic profile, the findings revealed that most participants belong to the age group of 20-30years (51.70%). Regarding the educational status of most of the participants' educational status was with B.sc Nursing educational level (67.05%). Most of the participants have not experienced breast milk donation (93.18%), but they accept breast milk donation (94.29%).<sup>61</sup>

**Velmurugan Sharumathi et., al. (2020)**, Conducted a cross-sectional study to assess the knowledge and perception on human milk bank among postnatal mothers of a women and child care hospital of a in a tertiary care center. Sample size was calculated by assuming 50% of the mothers may have favorable perception toward human milk donation with 10% relative precision and 95% confidence interval. 100 consecutive postnatal mothers were enrolled in the study after obtaining institute research committee and ethical committee approval. All postnatal mothers except who were critically ill were included in the study. A structured questionnaire was used to collect data on knowledge and perception of postnatal mothers. Results showed 90% of the participants belong to age group of 20–30 years. Mean age was  $26 \pm 3$  Years. 83% of them were from rural domicile, 77% of them had basic education, almost half of the (52%) participants were unemployed, remaining participants were either semi-skilled (28%) or unskilled (30%), 88% of the participants belonged to Hindu religion. 68% of the women showed willingness to use donor milk or donate breast milk if need arises. Regarding maternal perception regarding human milk donation and banking 71% of the postnatal mothers had favorable perception.<sup>62</sup>

**Ikonen R et al., (2018)**, conducted a cross-sectional study on preterm infants' mothers' initiation and frequency of breast milk expression and exclusive use of mother's breast milk in neonatal intensive care units. The sample consisted of 129 mothers. One-third of the mothers had adequate expression practices. Half of the infants exclusively received their mother's own breast milk. High gestational age was associated with both late expression initiation and nonexclusive breast milk use. The mothers-maintained expression regardless of their well-being.<sup>63</sup>

**St Fleur R, Petrova A (2015)**, conducted a study on Knowledge and perception of breastfeeding practices in Hispanic mothers in association with their preferred language for communication. Economically disadvantaged minority mothers with limited proficiency in English show suboptimal breastfeeding rates. In the present survey, the knowledge and perception of Hispanic mothers regarding their breastfeeding practices were analyzed in association with their language preference for communication. They concluded that in economically disadvantaged Hispanic mothers, a preference for communication in Spanish is associated with limited breastfeeding knowledge and lack of breastfeeding-related educational networks. Language preference should be

addressed while providing breastfeeding education and support for Hispanic mothers to help improve their understanding and breastfeeding networks.<sup>64</sup>

**Nirali Tanka (2021)**, conducted a pre-experimental study to assess the effectiveness of structured teaching program on knowledge regarding the expressed breast milk among postnatal working mothers in selected area in Junagadh district. study was conducted at selected area of Junagadh district. Total 40 samples were selected from Junagadh district based on non-probability purposive sampling. The researcher used structured interview schedule and structured questionnaire for data collection regarding demographic variables and pre-test. As a part of intervention structured teaching programmed on expressed breast milk was carried out among postnatal working mothers. The post-test score was measured with the same questionnaires after seven days. The collected data were analyzed by using inferential statistical method. t-test was used to evaluate the effectiveness of STP on the level of knowledge regarding expressed breast milk among postnatal working mothers. It revealed that the mean score of pre-tests was 10.65 and post-test was 16.58. The mean difference was 5.93. The obtained “t” value 21.12. Hence it was highly significant  $p < 0.001$  level. Hence their findings of the study revealed that the structured teaching programmed was effective in improving knowledge regarding expressed breast milk among postnatal working mothers.<sup>65</sup>

**T. Buvaneswari (2019)**, conducted a study on effectiveness of video-assisted teaching method on knowledge and skill regarding hand expression of breast milk and cup feeding among the mothers of low-birth-weight baby demography result shows that most of the mothers were in the age group of 21–25 years, who had a primary level of education. Regard to knowledge, it shows that, during pre-test, around 75% of mothers had inadequate knowledge, whereas in the post-test, 95% of mothers had adequate knowledge and related to skill on hand expression, during pre-test, around 93.33% of mothers had inadequate skill, whereas in post-test, 98.33% of mothers had adequate skill. The “t”-test highlights that there was a statistically significance difference between pre-and post-test ( $P < 0.0001$  and  $P \leq 0.0001$ ).<sup>66</sup>

### III. Review of literature related to storage of breast milk.

**Ester Mary (2017)**, conducted a study on effectiveness of self-instructional module on knowledge regarding collection and storage of expressed breast milk among working mothers of infants at selected children hospital in Chennai. 100 working lactating mothers were selected by using convenient sampling technique. An Information booklet and pamphlet were used to educate the mothers. In pre-test out of 100 lactating mothers 15 had adequate knowledge, 35 had moderate knowledge, 50 had inadequate knowledge. In post-test out of 100 lactating mothers 65 had adequate knowledge 25 had moderate knowledge, 10 had inadequate knowledge. The pretest mean value is 10.62. With 24.81 standard deviation and posttest mean value is 25.96 with 0.98 standard deviation. The paired-t test reveals that self-instructional module was effective in increasing the knowledge on collection and storage of expressed breast milk among mothers of infants at the level of  $p < 0.05$ .<sup>67</sup>

**Renuka (2018)**, conducted a study to assess the knowledge and attitude regarding the storage of breast milk for the infants among staff nurses working in NICU, PICU, Antenatal, postnatal, and labor room of the selected hospitals of Gwalior city. The findings revealed that 15% staff nurses had poor knowledge, 66.66% had average knowledge and 18.37% had good knowledge. Religion had a significant relationship with knowledge whereas age and source of knowledge had a high degree of significance with attitude (at  $p < 0.05$  level). It was concluded that staff nurses had average knowledge with a positive attitude towards the storage of breast milk.<sup>68</sup>

**Kamala K.N et. al. (2019)**, conducted a study to assess the effectiveness of structured teaching programme on knowledge regarding expression and storage of breast milk among antenatal mothers, Attending antenatal clinic at H.S.K hospital and research center, bagalkot, karnataka. An evaluative approach with one group pre-test, post-test design was used. The sample consisted of 50 antenatal mothers attending antenatal clinic at H.S.K hospital Bagalkot. They were chosen by convenient sampling technique of non-probability type. The study was conducted at H.S.K Hospital and research center Bagalkot. The data was collected before and after administration of structured teaching programme. Structured knowledge questionnaire was used to collect data. The findings of the study concluded that antenatal mothers had inadequate level of knowledge regarding expression and storage of breast milk. The structured teaching programme was effective in improving the knowledge of the antenatal mothers. The findings of the study concluded that antenatal mothers had inadequate knowledge regarding expression and storage of breast milk. The STP was highly effective in improving the knowledge of antenatal mothers regarding expression and storage of breast milk.<sup>69</sup>

**M Miranda (2021)**, conducted a longitudinal study. Maternal milk is the optimal feeding way for the infant at least for the first six months of life. Its properties include nutrients intake and, particularly, to provide the infant with several beneficial compounds improving his growth and protecting him from the diseases typical of this time period. These properties justify the manipulating processes before its intake in order to promote and warrant the adherence to it, both at the hospital and at home, being more important in premature infants and/or with low birth weight given their increased vulnerability, in spite of the fact that during these processes some of its properties may be partially lost. There exist, therefore, an interest in knowing the impact of the procedures applied to human milk on its qualitative properties, such as the antioxidant capacity. The milk from 30 healthy women was analyzed. The milk's antioxidant capacity was assessed by the following parameters: total antioxidant capacity and level of malondialdehyde. The results obtained showed that pH decreases gradually from the storage beginning, whereas the antioxidant capacity remains constant for the first 24 hours, with a different result depending on the parameter used, and thereafter significant changes were observed. In case of needing extraction and storage of maternal milk before its consumption, the storage time should be minimized, preferably less than 24 hours in order to preserve the oxidative stress.<sup>70</sup>

**Winston Sheen (2021)**, Is the antioxidant capacity of stored human milk preserved? freshly expressed milk was obtained from mothers in the NICU, stored at  $-20^{\circ}\text{C}$  for 6 months, and compared with the baseline. Paired samples were analyzed for glutathione, hydrogen peroxide ( $\text{H}_2\text{O}_2$ ), 8-isoprostane, catalase, and superoxide dismutase. There was no change in  $\text{H}_2\text{O}_2$  concentration between baseline and 6 months. Significant reductions from baseline in both catalase and superoxide dismutase concentrations and activities, total glutathione, oxidized glutathione, reduced glutathione, and the ratio of reduced to oxidized glutathione were observed ( $p < 0.05$ ). There was a significant increase in 8-isoprostane concentrations ( $p < 0.001$ ). These data indicate significant changes in antioxidant capacity of human milk, including oxidation of macromolecules, after storage at  $-20^{\circ}\text{C}$  for 6 months. The clinical implication of these findings may explain the nonuniform protection against oxidant disease in preterm infants fed human milk.<sup>71</sup>

**April D Fogleman (2017)**, storage of unfed and leftover mothers' own milk. In the first of two pilot studies, 12 mother-infant dyads participated. The milk studied included freshly expressed unfed and freshly expressed leftover milk. Milk samples were stored at  $24^{\circ}\text{C}$ ,  $4^{\circ}\text{C}$ , or  $-20^{\circ}\text{C}$ . In the second pilot study, 11 mother-infant dyads participated. The milk studied included milk that had been previously frozen, including previously frozen leftover milk. Milk samples were stored at  $24^{\circ}\text{C}$  and  $4^{\circ}\text{C}$ . After storage in both studies, the milk was analyzed for bacteriological and immunological properties. Bacteriological and immunological characteristics of freshly expressed unfed and freshly expressed leftover milk and previously frozen unfed and previously frozen leftover milk remained stable during storage at  $4^{\circ}\text{C}$  for at least 6 days. The quality of all groups of mothers' milk declined when stored at  $24^{\circ}\text{C}$  for longer than 3 hours. While this study provides evidence that human milk might be safe at longer storage times, storage guidelines should not be revised until more research is performed. This study serves as a call to action for more research on the topic of human milk storage, specifically leftover human milk. The study provides information to inform future study designs on the topic of unpasteurized human milk storage. More research is needed regarding leftover human milk storage with a greater number of participants, determination of the quality of human milk, and the storage of human milk in a real-life setting.<sup>72</sup>

**Ali Faraghi Ahrabi (2016)**, effects of extended freezer storage on the integrity of human milk mothers donated 100 mL of freshly expressed milk. Samples were divided into baseline, storage at  $-20^{\circ}\text{C}$  (fresh frozen) for 1, 3, 6, and 9 months, and prior storage at  $+4^{\circ}\text{C}$  for 72 hours (refrigerated frozen) before storage at  $-20^{\circ}\text{C}$  for 1 to 9 months. Samples were analyzed for pH, total bacterial colony count, gram-positive and gram-negative colony counts, and concentrations of total protein, fat, no esterified fatty acids, lactoferrin, secretory IgA, and osmolality. Milk pH, total bacterial colony count, and Gram-positive colony counts decreased significantly with freezer storage ( $P < .001$ ); bacterial counts decreased most rapidly in the refrigerated frozen group. The gram-negative colony count decreased significantly over time ( $P < .001$ ). No esterified fatty acid concentrations increased significantly with time in storage ( $P < .001$ ). Freezing for up to 9 months did not affect total protein, fat, lactoferrin, secretory IgA, or osmolality in either group. Freezer storage of human milk for 9 months at  $-20^{\circ}\text{C}$  is associated with decreasing pH and bacterial counts, but preservation of key macronutrients and immunoactive components, with or without prior refrigeration for 72 hours. These data support current guidelines for freezer storage of human milk for up to 9 months for both freshly expressed and refrigerated milk.<sup>73</sup>

**Rotem Orbach et. al. (2019)**, the effect of deep freezing on human milk macronutrients content. mature HM samples from 25 mothers of term and preterm infants were collected. Each sample was divided into six aliquots for storage at  $-20^{\circ}\text{C}$  and  $-80^{\circ}\text{C}$  for

4, 12, and 24 weeks. After thawing and homogenization, energy and macronutrients content were measured using an HM infrared spectroscopy analyzer. A total of 150 HM samples were available for analysis. Thirteen samples were removed due to calibration errors. The final analysis was performed on 137 samples with validated results. Fat and energy content were consistently higher in the  $-80^{\circ}\text{C}$  samples compared with the paired  $-20^{\circ}\text{C}$  samples at each time point ( $p < 0.05$ ). Comparison of the differences in macronutrients content over time (4 versus 24 weeks) revealed a significant loss of fat (0.3 g/100 mL [7.9%],  $p = 0.001$ ) and energy (2.3 kcal/100 mL [3.3%],  $p = 0.03$ ) in the  $-20^{\circ}\text{C}$  group. Fat and protein were also significantly decreased over time in the  $-80^{\circ}\text{C}$  group (by 0.14 g/100 mL [3%],  $p = 0.009$ , and 0.06 g/100 mL [6.4%],  $p = 0.02$ , respectively). Long-term storage of HM at  $-80^{\circ}\text{C}$  is associated with better fat and energy preservation compared with storage at  $-20^{\circ}\text{C}$ . These results may help construct evidence-based recommendations and guidelines for optimal HM storage.<sup>74</sup>

**Beatriz M. Reyes-Foster et. Al. (2016)**, Human milk handling and storage practices among peer milk-sharing mothers. This study aimed to learn about the milk-handling practices of expressed human milk by milk-sharing donors and recipient caretakers. In this article, we explore the degree to which donors and recipients adhere to the academy of breastfeeding medicine clinical recommendations for safe handling and storage. Online surveys were collected from 321 parents engaged in peer milk sharing. Univariate descriptive statistics were used to describe the safe handling and storage procedures for milk donors and recipients. A two-sample t-test was used to compare safety items common to each group. Multivariate ordinary least squares regression analysis was used to examine sociodemographic correlates of milk safety practices within the sample group. Findings indicate that respondents engaged in peer milk sharing report predominantly positive safety practices. Multivariate analysis did not reveal any relationship between safety practices and sociodemographic characteristics. The number of safe practices did not differ between donors and recipients. Parents and caretakers who participate in peer human milk sharing report engaging in practices that should reduce risk of bacterial contamination of expressed peer shared milk. More research on this particular population is recommended.<sup>75</sup>

**Peila, C. (2018)**, Effects of pasteurization and refrigerated storage on human milk neurobiomarkers concentrations. HM samples were collected by standardized methods from 20 mothers carrying both preterm and term newborns. An aliquot of each sample was immediately frozen at  $-80^{\circ}\text{C}$ , whilst another one was Holder pasteurized and then frozen. All samples were then analyzed by GeLC-MS. The protein bands of interest were excised from the gel, digested with trypsin and identified by nano-HPLC-MS/MS analysis. The protein profile before and after Hop showed qualitative differences only in 6 samples out of 20, while in the remaining 14 no detectable differences were found. The differences interested only colostrum and transitional milk samples and regarded the decrease of the electrophoretic bands corresponding to alpha and beta-casein, tenascin, lactoferrin and immunoglobulin. Conclusions: In most samples, Hop did not cause any modification, thereby preserving the biological activity of HM proteins.<sup>76</sup>

**Caroline J Chantry (2019)**, conducted a prospective feasibility of using flash-heated breastmilk as an infant feeding option for HIV-exposed, uninfected infants after 6 months of age in urban Tanzania. Prospective longitudinal. One hundred one HIV-infected breastfeeding mothers. Thirty-seven of 72 eligible mothers (51.4%) chose to flash-heat. Median (range) frequency of milk expression was 3 (1-6) times daily and duration of method use on-study was 9.7 (0.1-15.6) weeks. Mean (SD) daily milk volume was 322 (201) mL (range 25-1120). No heated and 32 (30.5%) unheated samples contained bacterial pathogens. FH is a simple technology that many HIV-positive women can successfully use after exclusive breastfeeding to continue to provide the benefits of breastmilk while avoiding maternal-to-child transmission associated with nonexclusive breastfeeding. Based on these feasibility data, a clinical trial of the effects of FH breastmilk on infant health outcomes is warranted.<sup>77</sup>

**Aleksandra Wesolowska (2019)**, conducted a study innovative techniques of processing human milk to preserve key components. Human milk not only contains all nutritional elements that an infant requires, but is also the source of components whose regulatory role was confirmed by demonstrating health-related deficiencies in formula-fed children. A human milk diet is especially important for premature babies in the neonatal intensive care unit (NICU). In cases where breastfeeding is not possible and the mother's own milk is insufficient in volume, the most preferred food is pasteurized donor milk. The number of human milk banks has increased recently but their technical infrastructure is continuously developing. Heat treatment at a low temperature and long time, also known as holder pasteurization ( $62.5^{\circ}\text{C}$ , 30 min), is the most widespread method of human milk processing, whose effects on the quality of donor milk is well documented. Holder pasteurization destroys vegetative forms of bacteria and most viruses including human immunodeficiency virus (HIV) herpes and cytomegalovirus (CMV). The macronutrients remain relatively intact but various beneficial components are destroyed completely or compromised. Enzymes and immune cells are the most heat sensitive elements.

The bactericidal capacity of heat-pasteurized milk is lower than that of untreated milk. The aim of the study was for a comprehensive comparison of currently tested methods of improving the preservation stage. Innovative techniques of milk processing should minimize the risk of milk-borne infections and preserve the bioactivity of this complex biological fluid better than the holder method. In the present paper, the most promising thermal pasteurization condition (72 °C–75 °C,) and a few non-thermal processes were discussed (high pressure processing, microwave irradiation). This narrative review presents an overview of methods of human milk preservation that have been explored to improve the safety and quality of donor milk.<sup>78</sup>

**Bharadva K (2017)** Raw human milk banking in India: scope and application bharadva k breastmilk feeding is the gold standard. Formula milk is getting easy access due to ignorance of scientific principles, lack of commitment and efforts to promote human milk, besides unavailability of human milk banks. There is a grave need to create awareness for using breastmilk in health care facilities. Risk of unpasteurized donor human milk is probably overrated. Donated raw milk given to new born infants produce no ill effects including HIV transmission, as observed and practiced in Norway. Bacteriostatic qualities of fresh milk resist bacterial growth. Bacterial counts reduce in fresh breastmilk over initial few hours due to phagocytic activity. New-borns fed MoM with high commensal bacteria count has no untoward effects. Thus, pasteurization of MoM is not recommended. Unprocessed mother's milk is choice of feeding pre-terms as often it grows only commensals on preserving. Such infants did not show higher late sepsis rates; had better fat absorption & growth; shorter hospital stay as compared to pasteurized donor milk. Refrigerators are there everywhere so MoM feeding can be easily practiced with proper dissipation of scientific information on managing human milk. In resource poor and ethic restricted countries efforts are being use unpasteurized raw frozen donor milk after stringent donor screening. These observations and facts open door to concept of raw human milk banking which has large scope in India. It is suggested that, before starting to donate, documenting two negative tests each for HIV, HBsAg and VDRL are desirable.<sup>79</sup>

**Maria Celestina (2020)**, conducted a study, analysis of the storage methods for raw human milk from mothers with infants admitted to a neonatal intensive care unit, according to brazilian regulations. All samples showed Doric acidity values within the established acceptable limit ( $\leq 8^{\circ}\text{D}$ ), as required by brazilian regulations. In addition, energy content did not significantly differ among fresh, refrigerated, and frozen milk samples (median of  $\sim 50$  kcal/100 mL for each). Most samples tested ( $> 80\%$ ) were considered top quality milk ( $< 4^{\circ}\text{D}$ ) based on acidity values, and milk energy content was preserved after storage. We conclude that the storage methods required by Brazilian regulations are suitable to ensure milk safety and energy content of stored milk when supplied to neonates.<sup>80</sup>

## SUMMARY

This chapter dealt with the review of research related to the present study. The main sources was electronic data base such as google scholar, pub med, newspaper, journals, textbook, magazines. The above review show that structured teaching programme helpful to improvement of knowledge among working women's regarding preservation of human milk at home.

## CHAPTER III RESEARCH METHODOLOGY

**Methodology** is a "conceptual framework for research, a coherent and logical scheme based on views, beliefs, and values that guides the choices researcher make."<sup>84</sup>

Research methodology are the techniques researchers use to structure a study to gather and analyze information relevant to research question the two alternatives paradise corresponds to those different methods for developing evidence a key methodology distinction is between quantitative research which is closely allied with the positivism and qualitative research which is associated with constructive enquiry.<sup>85</sup>

This chapter deals with the description of research methodology as research approach, research design, settings of the study, population, sampling, sampling technique, sample size, tool preparation, validity of tool, pilot study, procedure for data collection and the plan of data analysis adopted by the researcher. This chapter deals with the methodology used by the researcher to study effectiveness of structured teaching programme regarding preservation of human milk at home among working women's in selected schools.

## RESEARCH APPROACH

Research approach and research design are two terms that are frequently used interchangeably. However, research design is a broader plan to conduct a study, and research approach is an important element of the research design, which governs it.<sup>86</sup>

In view of the nature of problem selected for the study and the objectives to accomplished, on explanatory quantitative approach was used for the present study. This approach was considered to be the most suitable one to conduct the study because it would help the investigator to use one group & observe the difference in the knowledge score before and after importing of structured teaching programme among working women's regarding preservation of human milk at home in selected schools.

## RESEARCH DESIGN

The research design is the plan, structure, and strategy of investigations of answering the research question is the overall plan or blue print the researcher selects to carry out their study.<sup>86</sup>

In view of nature of the problem and to accomplish the objectives of the study, pre-experimental one group pre-test post-test research design was used to evaluate the effectiveness of structured teaching programme regarding preservation of human milk at home among working women's in selected schools.

The study design shows that on first day (day 1): pre-test was given to assess the existing knowledge regarding preservation of human milk at home among working women's in selected schools. The structured teaching programme was administered on the same day. On the seventh day (day 7) post-test was conducted to assess the gain in knowledge using the structure knowledge questionnaire. The study design systematically represented is as follow:

**TABLE NO. III (1) A pre-experimental one group pretest posttest research design**

### KEY:

**Q<sub>1</sub>:** Administration of structured knowledge questionnaire to assess pretest knowledge regarding preservation of human milk at

SAMPLE	PRE-TEST	INTERVENTION	POST TEST
Working women's	Administration of structured knowledge questionnaire on day.	Structured teaching programme administrated.	Administration of structured knowledge questionnaire on day 07.
	Q <sub>1</sub>	X	Q <sub>2</sub>

home among working women's on day 01.

**X:** Intervention includes proving information through structured teaching programme regarding preservation of human milk on day 01.

**Q<sub>2</sub>:** Administration of structured knowledge questionnaire to assess posttest knowledge regarding preservation of human milk at home among working women's on day 07.

### SETTING OF THE STUDY:

Setting of the study refers to Physical location and condition in which data collection takes place in study.<sup>85</sup>

The present study was conducted in selected schools.

### VARIABLES OF THE STUDY:

Variables are qualities, properties or characteristics of person, things or situations that change or vary. Chinn and Kramer stated that variables are concepts at different level of abstraction that are concisely defined to promote their measurement or manipulation within study.<sup>85</sup>

These variables are focus of the study or reflected the empirical aspect of the concept being studied:

### INDEPENDENT VARIABLES

“An independent variable was a presumed cause or activity that is manipulated or varied by the researcher to create the effect on the dependent variables”.<sup>87</sup>

In this study, independent variable is structured teaching programme regarding preservation of human milk at home among working women's.

**DEPENDENT VARIABLES**

“A dependent variable is presumed outcome or response due to effect of the independent variable, which researcher wants to predict or explain.”<sup>85</sup>

In this study, dependent variable is knowledge regarding preservation of human milk at home among working women’s.

**DEMOGRAPHIC VARIABLES**

“A demographic variable is a variable that is collected by researcher to describe the nature and distribution of the sample used with inferential statistics.”<sup>85</sup>

In this study, demographic variables are age, educational status, type of family, area of residence, source of information regarding preservation of breast milk, techniques you followed to express breast milk and method, you used for storage of breast milk.

**POPULATION**

Population is the aggregation of all the units in which a researcher interested. In other words, population is the set of people or entities to which the results of a research are to be generalized.<sup>89</sup>

In this study, the population consist of working women’s whom are working in selected schools.

**TARGET POPULATION**

“A target population consist of the total group of people or object which are meeting the designed set of criteria of interest of the researcher. Target population is the aggregate of cases about which the researcher would generalize the information”.<sup>90</sup>

In this study, the target population were the working women’s of selected schools.

**ACCESSIBLE POPULATION**

“It is the aggregate of cases that confirm to designed criteria are also accessible as a sample for a study”.<sup>90</sup>

In this study, the accessible population are working women’s in selected schools available at the time of data collection who met inclusion criteria.

**SAMPLING:****SAMPLE:**

“Sample may be defined as representative unit of target population, which is to be worked upon by researcher during their study.”<sup>90</sup>

In this study, sample were selected working women’s who fulfilled the inclusion criteria of the study.

**SAMPLING TECHNIQUE:**

“Sampling techniques is defined as the process of selecting a portion of a population to represent the entire population for the study in research.”<sup>90</sup>

In this study, researcher was used Probability simple random sampling technique.

**SAMPLE SIZE:**

“Sample size refers to the number of people who participate in the study.”<sup>90</sup>

The sample size selected for this study was 60 samples who fulfilled the sampling criteria and who were willing to participate in the study.

The minimum sample size to estimate the population mean formula was used to calculate the sample size.

$$n = z_1^2 s^2/d^2$$

where s = standard deviation

$$z_1 = 1.96$$

d = absolute precision

In this study, the sample size comprised of 60 working women’s working in selected schools.

**SAMPLE SELECTION CRITERIA:****Inclusion criteria:**

Working women's who are

- Able to speak read & write Marathi, English & Hindi.
- Willing to participate in the study.
- Married.

#### **Exclusion Criteria:**

Working women's who are:

- Not present during the study.
- Done permanent family planning.
- Women selected during pilot study.

#### **TOOL & TECHNIQUE FOR THE STUDY**

Structured Questionnaire, is one in which the questionnaire decided in advance. When used as an interviewing method, the questions are asked exactly as they are written, as they in the same sequence, using the same style, for all interviews. Nonetheless, the structured questionnaire can sometimes be left a bit open for the interviewer to amend to suit a specific context.<sup>85</sup>

In this study the researcher used a structured knowledge questionnaire to assess the knowledge regarding preservation of human milk at home.

#### **DEVELOPMENT OF THE TOOL:**

The following steps were carried out in formulating the tool

1. Related literature via journal, articles, periodicals, books were reviewed.
2. Blue print was prepared.
3. Guidance and consultation of the subject experts were taken and modifications were made accordingly.
4. Establishment of tool.

Description of the tool: The tool consisted of 2 sections

#### **Section A: Socio demographic data**

It consisted of 7 items regarding demographic variables of the selected working women's.

The items included in the demographic variables were Age, Education, Type of family, Area of residence, Source of information regarding storage & preservation of breast milk, Techniques you followed to express breast milk, Method you used for the storage of breast milk.

#### **Section B: Structured teaching programme**

It consisted of 30 items to assess the knowledge of working women's regarding preservation of human milk at home.

#### **Question was asked regarding:**

- Introduction & meaning of the breast feeding
- Advantages of exclusive breast feeding.
- Indication of exclusive breast feeding.
- Methods in expressing of breast milk.
- Techniques used in expressing of human (breast) milk
- Storing of expressed human (breast) milk.

#### **SCORING**

The structured knowledge questionnaire was developed into only one section to assess the knowledge of working women's regarding preservation of human milk at home. Section B of the questionnaire dealt with objective type (multiple type question)

items. The score of the section B were based on the worth of correct answer. The correct response was given '1' mark and incorrect response '0' mark. Knowledge was graded from poor to excellent knowledge.

In the self-structured questionnaire for each question, 4 options were given out of which 3 were distracters with only one correct response, each correct answer. The highest score was 30

**TABLE NO. III (2) Tool evaluation criteria for structured knowledge questionnaire**

MARKS	SCORE
21-30	Good
11-20	Average
0-10	Poor

#### TESTING OF THE TOOL:

The tool prepared for data collection was tested for its Feasibility, Content Validity and Reliability.

#### FEASIBILITY OF THE STUDY:

1. Permission was obtained from respective authority of selected schools.
2. Participants were co-operative and they gave written informed consent.
3. Had information about breast feeding.

#### VALIDITY OF TOOL:

“Validity refers to the degree to which an instrument measures what is supposed to be measuring”.<sup>87</sup>

The content validity of the tool was established by the consultation with 24 experts. Expert of obstetrical and gynecological nursing 15, expert from obstetrical gynae doctor 02, Expert from community health nursing 02, expert from medical and surgical nursing 03, expert from mental health nursing 01, expert of statistician 01. Expert were requested to give their opinions and suggestions regarding relevant, not relevant and need to modify in each item of tool. After receiving the opinion from the expert & consultation with guide some modifications were done in demographic variables, option of some questions and wording were reconstructed.

#### RELIABILITY OF TOOL

“Reliability is the degree of consistency and accuracy with which an instrument measures the attributed for which it is designed to measure.”<sup>90</sup>

The tool was administered to 06 samples of selected working women's, other than actual place of study. Reliability was assessed using split half method was used for reliability. The tool was found to be reliable (knowledge  $r = 0.82$ )

$$r = \frac{(n \sum xy) - (\sum x)(\sum y)}{(\sqrt{[n \sum x^2 - (\sum x)^2][n \sum y^2 - (\sum y)^2]}}$$

$$\text{Reliability (y)} = 2r/1 + r$$

Where r is the correlation coefficient

After testing of validity and reliability the tool were translate to marathi and then again translated to English to check its appropriateness.

#### PILOT STUDY

Pilot study is a small-scale version to test the plan and method of a research study.<sup>87</sup>

The pilot study is undertaken to assess the feasibility of the planned study, adequacy of the instrumentation and to detect any problem in the proposed methodology.

**Step I:** Researcher obtained permission from competent authority of selected schools 29<sup>th</sup> Nov 2022.

**Step II:** Researcher interacted with working women's of selected schools & explained about purpose, importance of research study.

**Step III:** Researcher selected total 9 working women's as per inclusion criteria of the study. Consent form was taken from them on 1<sup>st</sup> Dec 2022.

**Step IV:** Researcher assessed knowledge regarding preservation of human milk at home by conducting pre-test on 2<sup>nd</sup> Dec 2022.

**Step V:** Administration of structured teaching programme was started from the same date of pre-test.

**Step VI:** Posttest knowledge score was done after administration of structured teaching programme on the day 7<sup>th</sup> dated on 9<sup>th</sup> Dec 2022

Data analysis was done on data of 9 working women's by descriptive and inferential statistics. The significant difference between pre-test and post-test was found by using paired t-test. Difference found significant.

After conducting pilot study, it was found that the study was feasible and effective. The concerned authority and the samples were found to be co-operative.

## DATA COLLECTION PROCESS

### Ethical Consideration

- Prior to collection of data the researcher obtained permission from the competent authority of the selected rural area.
- Informed consent was taken from the working women's to conduct the study.
- The period of data collection commenced on

### Administration of Tool Pre-Test and planned health teaching

Data was collected as per following steps:

**Step I:** Researcher obtained permission from competent authority of selected schools on 17<sup>th</sup> Dec 2022

**Step II:** Researcher interacted with working women's of selected schools & explained about purpose, importance of research study.

**Step III:** Researcher selected total 60 working women's as per the inclusion criteria of the study & consent taken from them on 18<sup>th</sup> Dec 2022

**Step IV:** Researcher done assessment of knowledge of working women's by conducting pre-test on 19<sup>th</sup> Dec 2022 & 20<sup>th</sup> Dec 2022.

**Step V:** Administration of structured teaching programme was conducted on same day of pre-test.

- After each session structured teaching programme on preservation of human milk at home after pre-test. The teaching was interactive session where working women's were encouraged to come with own thoughts, opinions and feedback.
- Sessions were completed within 40-45 minutes. Doubts were asked by working women's and it was cleared by researcher. As it was interesting topic.

**Step VI:** Posttest assessment was done after the administration of structured teaching programme on day 7 dated on 26<sup>th</sup> Dec 2022 & 27<sup>th</sup> Dec 2022.

Data analysis was done on data of 60 working women's by descriptive and inferential statistics.

### PLAN FOR DATA ANALYSIS:

#### 1. Descriptive statistics

- The data obtained was planned to be analyzed on the basis of the objectives of the study using descriptive and inferential statistics.
- The data was arranged in master sheet.
- Data was presented in tables, graphs and diagrams. The level of knowledge was grouped from poor to good.
- Mean and standard deviation was used to evaluate. The effectiveness of structured teaching programme regarding preservation of human milk at home.

#### 2. Inferential statistics

- Inferential statistics consists of techniques that allows to study samples and the make generalization about the population from which they were selected.
- Further statistical significance of the effectiveness of structured teaching programme method by using 't' test.

- The association between the post-test knowledge score of working women's and selected demographic variables was tested using chi- square test.

## SUMMARY

This chapter of methodology deals with research approach, research design, identification of target population, accessible population, sampling technique, sampling size, inclusion & exclusion criteria of subject, tool preparation, feasibility of study, validity, reliability and pilot study, data collection process and plan for data analysis which helps the researcher in a better way to collect data from subjects so as to make the study effective.

### CHAPTER IV ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with analysis and interpretation of the data obtained from the response of 60 samples who were working women's in selected schools. The present study has been taken up to assess the effectiveness of structured teaching programme knowledge regarding preservation of human milk at home among working women's of selected schools.

Analysis is the process of breaking a complex topic smaller part to gain a better understanding of it. The analysis of data collected was done with help of descriptive and inferential statistics.<sup>89</sup>

The analysis of data collection was done with the help of descriptive and inferential statistics. The data was first coded and entered into computer, frequency, percentage, mean, standard deviation, paired 't' test, Chi square test were used to fulfil the objectives of the study.

#### OBJECTIVES:

##### Primary objectives:

1. To assess the knowledge regarding preservation of human milk at home among working women's in selected schools.

##### Secondary objectives:

1. To assess the effectiveness of structured teaching programme regarding preservation of human milk at home among working women's in selected schools.
2. To find out the association between knowledge score regarding preservation of human milk at home among working women's with selected socio demographic variables.

#### HYPOTHESIS

**H<sub>0</sub>:** There will be no significant association between pre and post-test knowledge score of working women's on preservation of human milk.

**H<sub>1</sub>:** There will be significant association between pre and post-test knowledge score of working women's on preservation of human milk.

#### ORGANIZATION OF STUDY FINDINGS

The data collected by the researcher during the data collection from 60 working women's was analyzed as per the objectives of the study and presented in following manner:

**SECTION I:** Demographic data of the working women's in selected schools in terms of frequency and percentage.

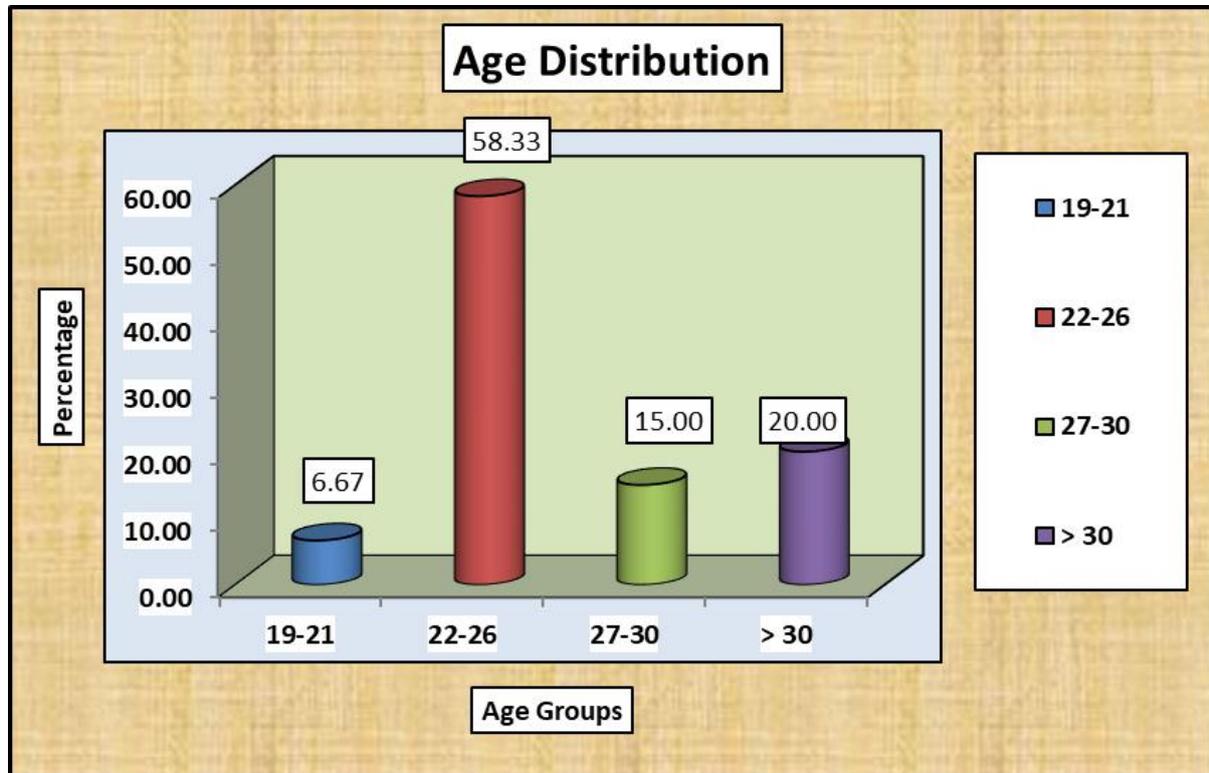
**SECTION II:** Assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools in terms of frequency and percentage.

**SECTION III:** Effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women's in selected schools.

**SECTION IV:** Association between pre-test knowledge scores regarding preservation of human milk at home among working women's in selected schools with their selected demographic variables.

**SECTION I: DEMOGRAPHIC DATA OF THE WORKING WOMEN'S SELECETED SCHOOLS IN TERMS OF FREQUENCY AND PERCENTAGE**

n= 60



**Figure No. IV. I. (1) cylindrical bar Diagram showing distribution of working women's according to their age (in years)**

Percentage wise distribution of sample according to their age depicts that the highest percentage 58.33% were in the age group of 22-26 years of age. 20% were in the age group above 30 years. 15% in the 27-30 years. Lowest percentage 6.67% were in the age group 19-21 years of age. Hence it can be interpreted that majority of the participant under study belonged to 22-29 years of age group. (fig. No. 1)

n =60

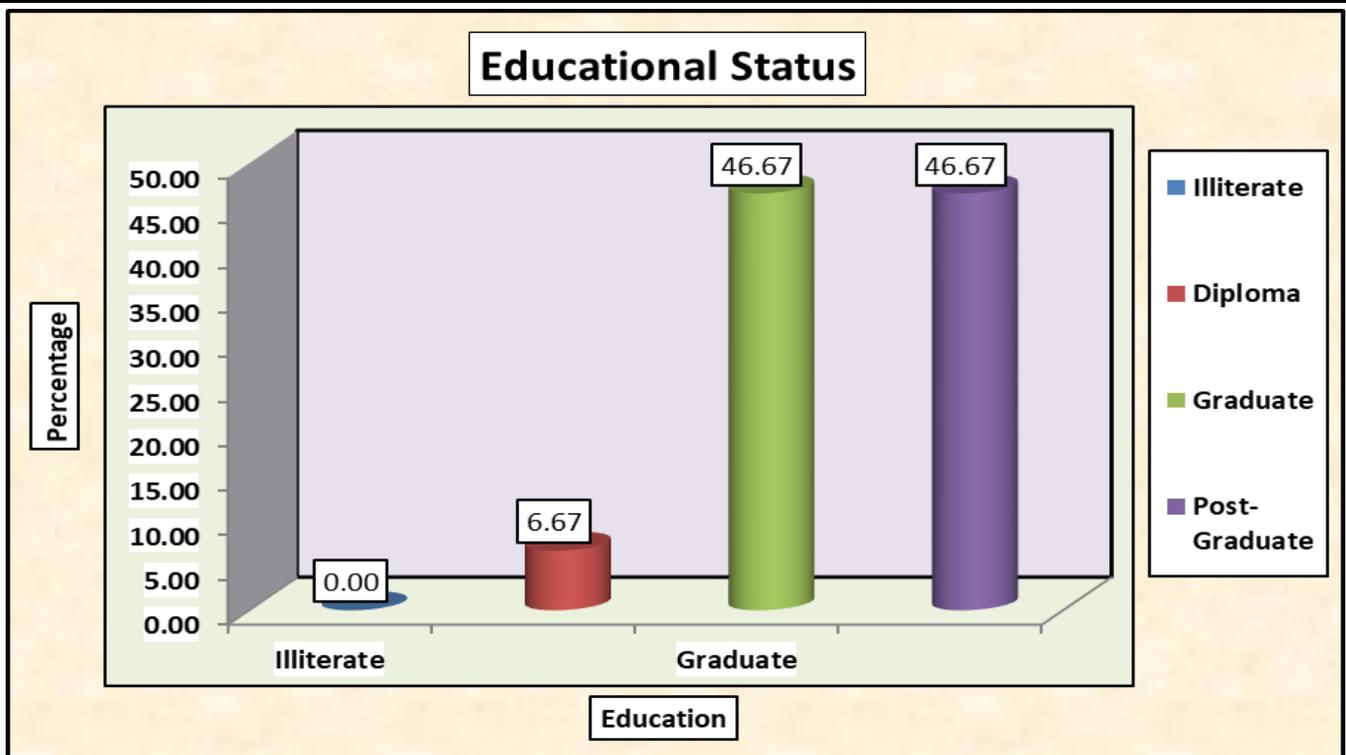


Figure No. IV. I. (2) Cylindrical Bar Diagram showing distribution of working women's according to their (educational status)

Percentage wise distribution, according to their education shows that highest percentage 46.67% of the participants were graduates and 46.67% of the participants were post-graduates. 6.67% participants were completed diploma. Among the sample lowest percentage no one women were from the Illiterate group. It shows that majority of the participants had graduates and post-graduates. (fig. no. 2)

n = 60

Figure No. IV. I. (3) Bar Diagram showing distribution of working women's according to their type of family

Percentage wise distribution of participant, according to their type of family, shows that highest percentage of 46.67% of participant were from nuclear families. 36.67% were from joint families. Among the sample lowest 16.67% were from extended families. It shows that the majority of participant belongs to type of family. (fig. no. 3)

n = 60

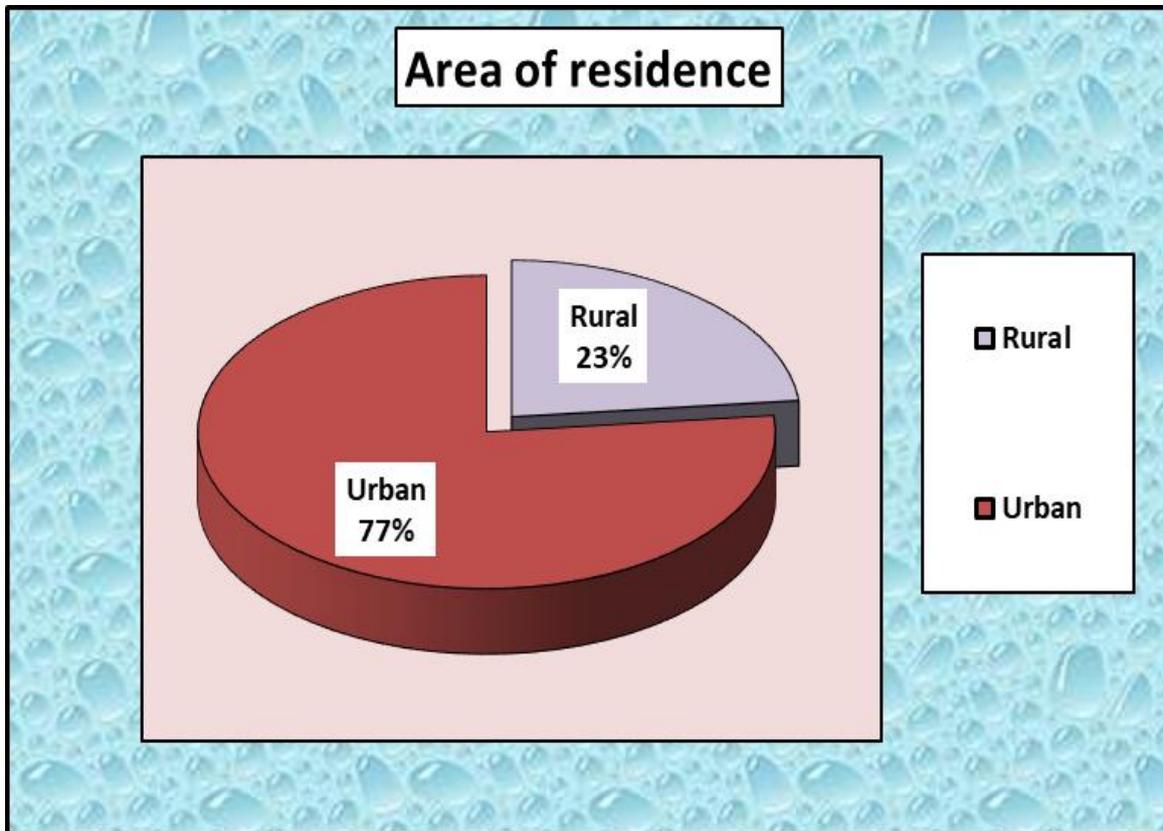
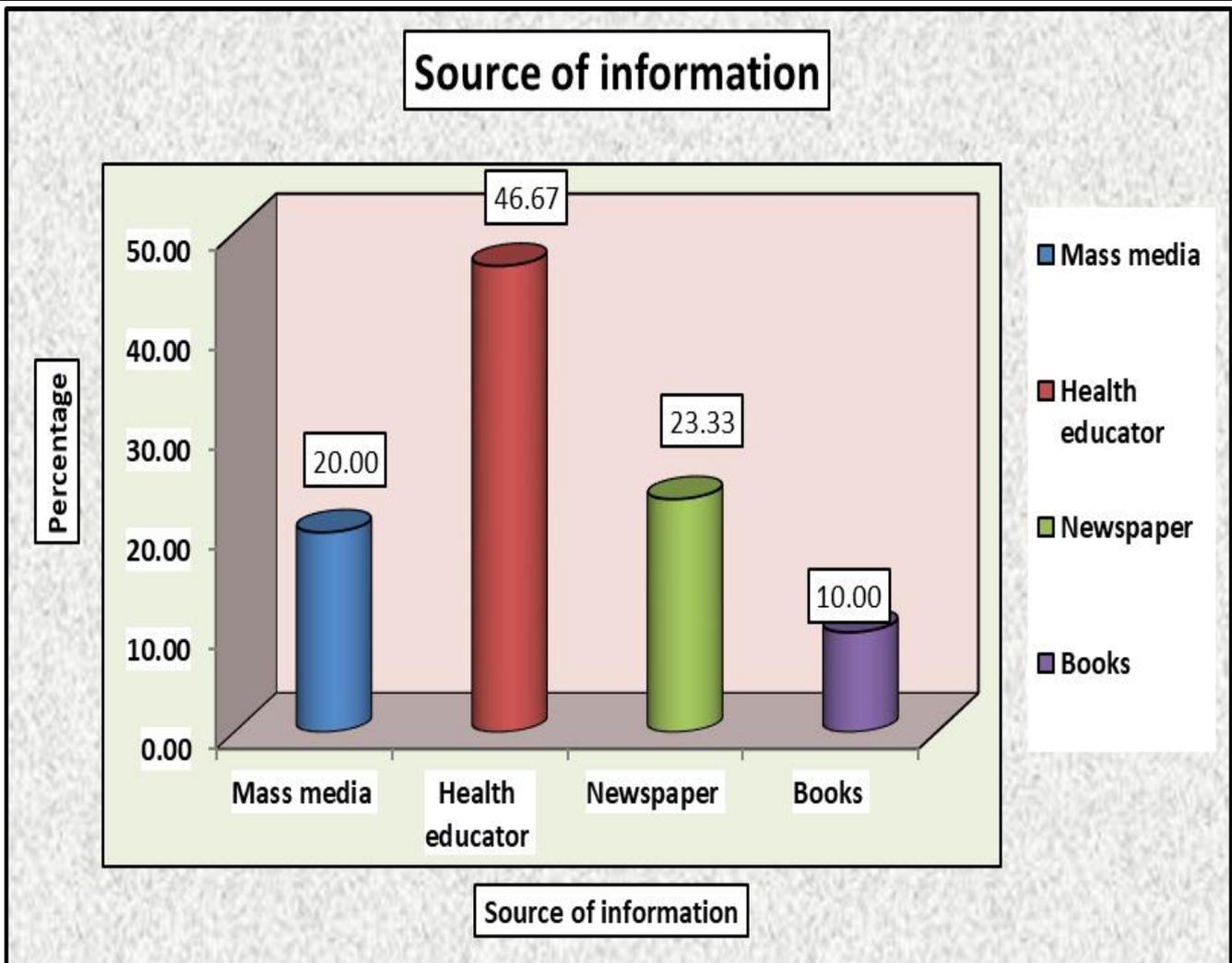


Figure No. IV. I. (4) Pie Diagram showing distribution of working women’s according to their area of residence

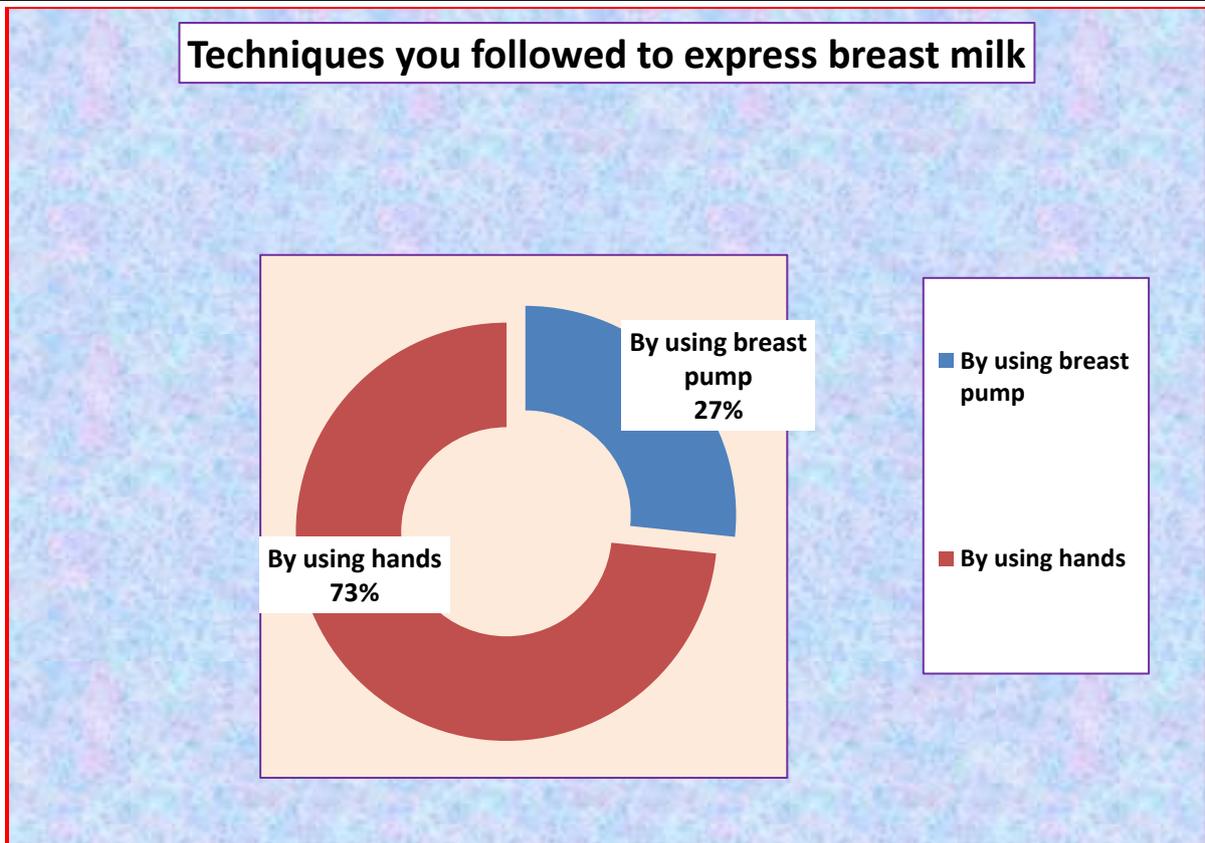
Percentage wise distribution of sample, according to their residence show that highest 76.67% of them from urban residential area and lowest 23.33% women were from the rural area. It shows that the majority of participant belongs to urban area. (fig. no. 4)

n = 60



**Figure No. IV. I. (5) Cylindrical bar Diagram showing distribution of working women’s according to their source of information**

Percentage wise distribution of sample according to their source of information shows that highest percentage 46.67% from health educator. 20% of them answered from mass media. Lowest percentage 10% of women answered from books. It shows that majority of sample had information from health educator. (fig. no. 5)



**Figure No. IV. I. (6) Pie Diagram showing distribution of working women’s according to their techniques you followed to express breast milk**

Percentage wise distribution, according to their techniques you followed to express breast milk highest percentage 73.33% of them answered by using hand. Lowest percentage 26.67% were answered by using breast pump. It shows that majority of the participants using hands. (fig. no. 6)

n = 60

**Figure No. IV. I. (7) Bar Diagram showing distribution of working women’s according to their method used for the storage of breast milk.**

Percentage wise distribution, according to their method used for the storage of breast milk show that highest percentage 53.33% of were answered none of above. 30% of were answered refrigerator. Lowest percentage 16.67% answered room temperature. It shows that majority of the participants had answered none of the above. (Fig. no.7)

**SECTION II**

**Table No. IV. II. (1) Assessment of pre-test knowledge of working women’s regarding preservation of human milk at home.**

n = 60

Variable	Groups	Score	Pre-Test	
			Frequency	Percentage
KNOWLEDGE	POOR	0-10	7	11.67

	AVERAGE	11-20.	52	86.67
	GOOD	21-30.	1	1.67
<b>KNOWLEDGE</b>	Minimum		7	
	Maximum		24	
	Average (SD)		13.98 (2.93)	

At the time of pretest, assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools, 11.67% of them had poor knowledge, 86.67% had average knowledge and 1.67% of them had good knowledge.

Average knowledge score at the time of pretest was 13.98 with standard deviation of 2.93. The minimum score of knowledge was 7 with maximum score of 24.

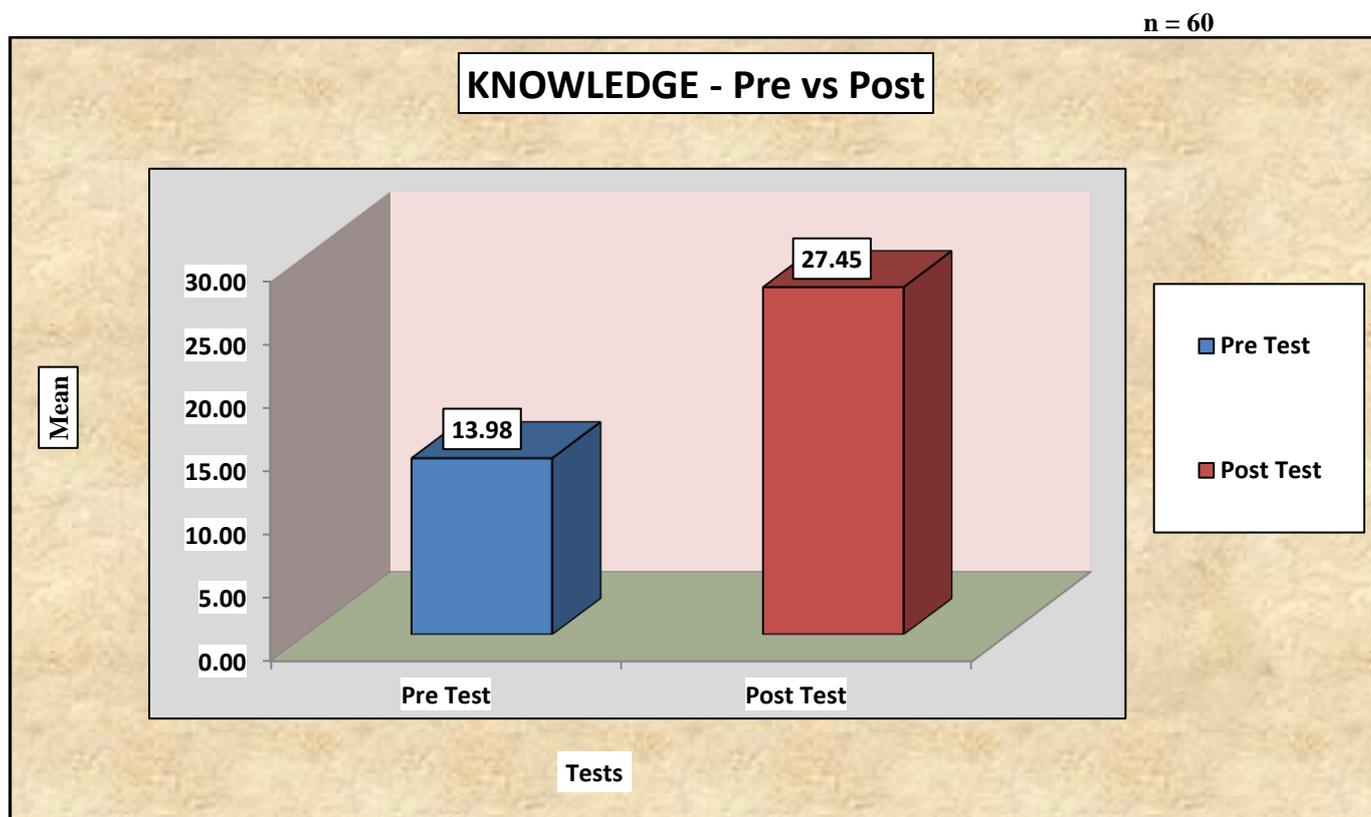
**Table No. IV. II. (2) Assessment of post-test knowledge of working women's regarding preservation of human milk at home.**

n = 60

Variable	Groups	Score	Post Test
----------	--------	-------	-----------

			Frequency	Percentage
KNOWLEDGE	POOR	0-10	0	0.00
	AVERAGE	11-20.	0	0.00
	GOOD	21-30.	60	100.00
KNOWLEDGE	Minimum		22	
	Maximum		30	
	Average (SD)		27.45 (1.78)	

At the time of posttest, assessment of the knowledge regarding preservation of human milk at home among working women’s in selected schools, no one of them had poor knowledge and average knowledge, all 100% of them had good knowledge. Average knowledge score at the time of posttest was 27.45 with standard deviation of 1.78. The minimum score of knowledge was 22 with maximum score of 30.



**Figure No. IV. II. (1) Bar Diagram showing mean score of Pre- test and Post-test knowledge of working women’s regarding preservation of human milk at home.**

Dealt with analysis of data related to assessment of the pre & posttest knowledge in terms of frequency and percentage.

For the assessment purpose, the total score of knowledge was divided in to three group like poor (0-10 score), percentage of pre-test was (11.67 %) and posttest was (0.00%), average (11-20score) percentage of pre-test was (88.67%) and posttest was (0.00%) and good (21-30 score) percentage of pre-test was (1.67%) and posttest was (100%).

**SECTION III**

Deals with analysis of data related to the “Effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women’s in selected schools.”

**Table No. IV. III. (1): Table showing Comparison of the average pre and posttest Knowledge score**

Group	Frequency	Mean	S.D.	t value	P value
Pre-Test	60	13.98	2.93	29.32	0.000
Post Test	60	27.45	1.78		

The comparisons of the pretest and posttest means of the knowledge were done by the paired t test. The pretest average knowledge score was 13.98 with standard deviation of 2.93. The posttest average knowledge score was 27.45 with standard deviation of 1.78. The test statistics value of the paired t test was 29.32 with p value 0.00. The p value less than 0.05, hence reject the null hypothesis. That means there is significant difference in pre and posttest knowledge.

#### SECTION IV

Deals with analysis of data related to the association between pre-test knowledge regarding preservation of human milk at home among working women’s with selected Socio-demographic variables.

**Table No. IV. IV. (1) Association of pre-test knowledge of working women’s regarding preservation of human milk at home with selected demographic variables.**

Variable	Groups	Knowledge - PRE		Chi Square	d. f.	p value	Significance
		Below Md	Above Md				
Age (in years)	19-21	3	1	5.85	3	0.12	Not Significant**
	22-26	26	9				
	27-30	4	5				
	> 30	5	7				
Educational Status	Illiterate	0	0	0.32	2	0.85	Not Significant**
	Diploma	3	1				
	Graduate	17	11				
	Post-Graduate	18	10				
Type of Family	Nuclear	19	9	5.86	2	0.05	Not Significant**
	Joint	16	6				
	Extended	3	7				
Area of residence	Rural	11	3	1.82	1	0.18	Not Significant**
	Urban	27	19				
Source of information	Mass media	5	7	4.53	3	0.21	Not Significant**
	Health educator	21	7				
	Newspaper	9	5				
	Books	3	3				

Techniques you followed to express breast milk	By using breast pump	8	8	1.67	1	0.20	Not Significant**
	By using hands	30	14				
Method, you used for the storage of breast milk	Refrigerator	12	6	0.49	2	0.78	Not Significant**

\*\* - Not Significant \* - Significant

Table No. IV. IV. (2) Association of post-test knowledge of working women's regarding preservation of human milk at home with selected demographic variables.

Variable	Groups	Knowledge - POST		Chi Square	d. f.	p Value	Significance
		Below Md	Above Md				
Age (in years)	19-21	3	1	2.01	3	0.57	Not Significant**
	22-26	23	12				
	27-30	8	1				
	> 30	9	3				
Educational Status	Illiterate	0	0	1.78	2	0.41	Not Significant**
	Diploma	4	0				
	Graduate	20	8				
	Post-Graduate	19	9				
Type of Family	Nuclear	27	7	2.806	2	0.24	Not Significant**
	Joint	17	5				
	Extended	5	5				
Area of residence	Rural	9	5	0.49	1	0.48	Not Significant**
	Urban	34	12				
Source of information	Mass media	8	4	1.78	3	0.61	Not Significant**
	Health educator	19	9				
	Newspaper	12	2				
	Books	4	2				
Techniques you followed to express breast milk	By using breast pump	10	6	0.903	1	0.34	Not Significant**
	By using hands	33	11				
Method, you used for the storage of breast milk	Refrigerator	9	9	6.72	2	0.035	Significant*
	Room temperature	7	3				
	None of above	27	5				

\*\* - Not Significant \* - Significant

Deals with analysis of data related to the association between post-test knowledge scores regarding preservation of human milk at home among working women's in selected schools with their selected demographic variables.

## SUMMARY

The chapter deals with analysis and interpretation of the data collected for the study. The analysis presents that structured teaching programme was significantly effective in improving knowledge of working women's regarding preservation of human milk at home as the mean score of pre-test was 13.98 and the post-test mean score was 27.45. Hence the researcher accepted  $H_1$  hypothesis. It was statistically interpreted that there was significant association of pre-test knowledge with selected demographic variables that is Education as Chi square value is higher than the table value at of significance which was statistically accepted. As well as there was significant association of post-test knowledge with selected demographic variables that is Education as Chi- square is and respectively higher than the table value at of significance which was statistically accepted.

## CHAPTER-V

### SUMMARY, FINDINGS CONCLUSION IMPLICATIONS AND RECOMMENDATIONS

This chapter discussed the major findings of the study and reviews them in relation to the findings of the studies. The aim of this study was to develop and implement the structure teaching programme to improve the knowledge of working women's. The effectiveness of structure teaching programme was evaluated by assessing the knowledge of preservation of human milk at home before and after administration of structure teaching programme.

This chapter presents brief summary of the study and its significant findings. It also includes the implications and recommendations for further study. The aim of the study was, study to assess the effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women's in selected schools.

The design used for the study was pre-experimental one group pre-test and post-test research design. The study was conducted at selected schools. The Sample size of study was 60 working women's at selected area. The reliability of the knowledge tool was determined split half Method of Reliability, the tool was administered to 9 samples. Reliability of the knowledge tool was found to be 0.89. The pilot study was conducted, to assess the feasibility of the study and to decide the statistical analysis and practicability of research. It was found feasible.

### STATEMENT OF THE PROBLEM

"Effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women's in selected schools."

### OBJECTIVES OF THE STUDY

#### PRIMARY OBJECTIVES:

1. To assess the pre-test knowledge regarding preservation of human milk at home among working women's in selected schools.

#### SECONDARY OBJECTIVES:

1. To assess the effectiveness of structured teaching programme regarding preservation of human milk at home among working women's in selected schools.
2. To find out the association between pre-test and post-test knowledge score regarding preservation of human milk at home among working women's with selected socio demographic variables.

### HYPOTHESIS

**H<sub>0</sub>:** There will be no significant association between pre and post-test knowledge score of working women's on preservation of human milk with selected demographic variable.

**H<sub>1</sub>:** There will be significant association between pre and post-test knowledge score of working women's on preservation of human milk with selected demographic variable.

### MAJOR FINDINGS OF THE STUDY

The analysis of demographic data of study samples gave an idea about general characteristics of working women's in selected schools.

The following are the major findings of the study.

## SECTION –I

### DEMOGRAPHIC VARIABLES

#### 1. Age (in years)

According to age of the working women's from selected schools, 6.67% women were from the age group 19-21 years of age, 58.33% women's from the 22-26 years of age, 15% from the 27-30 years and 20% of them from the age group above 30 years.

#### 2. Educational Status

In the study, according to educational of the working women's from selected schools, no one women were from the Illiterate group, 6.67% women's had completed diploma, 46.67% of them were graduates and 46.67% were post-graduates.

#### 3. Type of Family

In the study, according to type of family of the working women's from selected schools, 46.67% of them were from nuclear families, 36.67% from joint families and 16.67% of them from extended families.

#### 4. Area of residence

In the study, according to residence of the working women's from selected schools, 23.33% women were from the rural area and 76.67% of them from urban residential area.

#### 5. Source of information

According to Source of information regarding preservation of human milk at home among the working women's from selected schools, 20% of them answered from mass media, 46.67% from health educator, 23.33% from newspaper and 10% of women answered from books.

#### 6. Techniques you followed to express breast milk

To the question which Techniques you followed to express breast milk, 26.67 working women's from selected schools answered by using breast pump and 73.33% of them answered by using hand.

#### 7. Method, you used for the storage of breast milk

To the question which method, you used for the storage of breast milk, 30 working women's from selected schools answered refrigerator, 16.67% answered room temperature and 53.33% of them answered none of above.

## SECTION-II

### General assessments of Knowledge – Pre and Post Test

For the assessment purpose the total score of knowledge was divided in to three groups like poor (0-10 score), average (11-20 score) and good (21-30 score).

#### Pre Test:

At the time of pretest, assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools, 11.67% of them had poor knowledge, 86.67% had average knowledge and 1.67% of them had good knowledge. Average knowledge score at the time of pretest was 13.98 with standard deviation of 2.93. The minimum score of knowledge was 7 with maximum score of 24.

#### Post Test:

At the time of posttest, assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools, no one of them had poor knowledge and average knowledge, all 100% of them had good knowledge.

Average knowledge score at the time of posttest was 27.45 with standard deviation of 1.78. The minimum score of knowledge was 22 with maximum score of 30.

## SECTION-III

### Comparison of the pre and posttest Knowledge

The comparisons of the pretest and posttest means of the knowledge regarding preservation of human milk at home among working women's in selected schools were done by the paired t test.

The test was conducted at 5% level of significance.

The pretest average knowledge score was 13.98 with standard deviation of 2.93. The posttest average knowledge score was 27.45 with standard deviation of 1.78.

The test statistics value of the paired t test was 29.32 with p value 0.00. The p value less than 0.05, hence reject the null hypothesis.

That means there is significant difference in pre and posttest knowledge.

Shows that, structured teaching programme on knowledge regarding preservation of human milk at home among working women's in selected schools was effective.

#### **SECTION IV**

##### **ASSOCIATION OF KNOWLEDGE SCORE IN RELATION TO DEMOGRAPHIC VARIABLES – PRE-TEST**

The chi square test was used to see the association between pre-test knowledge scores regarding preservation of human milk at home among working women's in selected schools with their selected demographic variables. The test was conducted at 5% level of significance.

##### **No Significant Association:**

For all the demographic variables age, educational status, type of family etc. the p value of the association test with pretest knowledge was more than 0.05. That means, the knowledge of working women's regarding preservation of human milk at home was not associated with these demographic variables.

Concludes that, there was no significant association of these demographic variables with the pretest knowledge.

##### **ASSOCIATION OF KNOWLEDGE SCORE IN RELATION TO DEMOGRAPHIC VARIABLES – POST TEST**

The chi square test was used to see the association between post-test knowledge scores regarding preservation of human milk at home among working women's in selected schools with their selected demographic variables. The test was conducted at 5% level of significance.

##### **Significant Association:**

For the demographic variables' method, used for the storage of breast milk, the p value of the association test with posttest knowledge was less than 0.05. That means, the knowledge of working women's regarding preservation of human milk at home was associated with method used.

Concludes that, there was significant association of method, used for the storage of breast milk with the posttest knowledge.

##### **No Significant Association:**

For the demographic variables age, educational status, type of family etc. the p value of the association test with posttest knowledge was more than 0.05. That means, the knowledge of working women's regarding preservation of human milk at home was not associated with these demographic variables.

Concludes that, there was no significant association of these demographic variables with the posttest knowledge.

#### **DISCUSSION**

In the present study, researcher thought to structured teaching programme on knowledge regarding preservation of human milk at home in selected schools pre-experimental one group pre-test post-test research design was used total 60 working women's were selected probability simple random sampling technique as per the inclusion criteria. Structure knowledge question was used as instrument which consisted of two sections consisted of 7 items regarding demographic variables and consisted of questionnaires related to preservation of human milk at home, use and prior to the collection of data researcher was obtained permission from competent authority of the selected area and informed consent was taken from both the participants. Pre-test was conducted to assess the knowledge regarding preservation of human milk at home questionnaire on day 0 on the same day structured teaching programme administered to a using structured questionnaire regarding on 7<sup>th</sup> day Post test was conducted to assess the gain in knowledge using the same structured knowledge questionnaire on the same sample. The finding study revealed that according to age of the working women's from selected schools, 6.67% women were from the age group 19-21 years of age, 58.33% women's

from the 22-26 years of age, 15% from the 27-30 years and 20% of them from the age group above 30 years. According to educational of the working women's from selected schools, no one women were from the Illiterate group, 6.67% women's had completed diploma, 46.67% of them were graduates and 46.67% were post-graduates. according to type of family of the working women's from selected schools, 46.67% of them were from nuclear families, 36.67% from joint families and 16.67% of them from extended families. According to residence of the working women's from selected schools, 23.33% women were from the rural area and 76.67% of them from urban residential area. According to Source of information regarding preservation of human milk at home among the working women's from selected schools, 20% of them answered from mass media, 46.67% from health educator, 23.33% from newspaper and 10% of women answered from books. Techniques you followed to express breast milk, 26.67 working women's from selected schools answered by using breast pump and 73.33% of them answered by using hand. To the question which method, you used for the storage of breast milk, 30 working women's from selected schools answered refrigerator, 16.67% answered room temperature and 53.33% of them answered none of above.

At the time of pretest, assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools, 11.67% of them had poor knowledge, 86.67% had average knowledge and 1.67% of them had good knowledge. Average knowledge score at the time of pretest was 13.98 with standard deviation of 2.93. The minimum score of knowledge was 7 with maximum score of 24. At the time of posttest, assessment of the knowledge regarding preservation of human milk at home among working women's in selected schools, no one of them had poor knowledge and average knowledge, all 100% of them had good knowledge. Average knowledge score at the time of posttest was 27.45 with standard deviation of 1.78. The minimum score of knowledge was 22 with maximum score of 30.

The comparisons of the pretest and posttest means of the knowledge regarding preservation of human milk at home among working women's in selected schools were done by the paired t test. The test was conducted at 5% level of significance. The pretest average knowledge score was 13.98 with standard deviation of 2.93. The posttest average knowledge score was 27.45 with standard deviation of 1.78. The test statistics value of the paired t test was 29.32 with p value 0.00. The p value less than 0.05, hence reject the null hypothesis. That means there is significant difference in pre and posttest knowledge.

In the study shows that, structured teaching programme on knowledge regarding preservation of human milk at home among working women's in selected schools was effective. The chi square test was used to see the association between pre-test and post-test knowledgescores of demographic variables.

### SUMMARY

The purpose of the study was to assess the effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home among working women's of selected schools.

The pre-experimental one group pre-test post-test research design was used for the study. Which consisted of 60 samples that were selected on the basis of the probability simple random sampling technique. The content validity and reliability of the tool was done, which suggested that tool was reliable. The pilot study was conducted on 09 samples and the feasibility of the study was established. It was found that the tool had no major flaws and used for the final study with the changes as per the experts based on the objectives and hypothesis. The collected data was analyzed using descriptive and inferential statistics, Analysis of data was done in accordance with the objectives. The data analysis done by calculating mean frequency and its % and "p" value. The studies found that majority of working women's has poor knowledge which was improved after administrating structured teaching programme on preservation of human milk at home.

### CONCLUSION

From the study finding it is concluded that the structured teaching programme was effective improving the knowledge of working women's regarding preservation of human milk at home.

### NURSING IMPLICATION

#### Nursing Education

The nursing curriculum should consist of knowledge related health information using different methods of teaching Nursing students should be made aware of their role in health promotion and disease prevention in present and future year, which may help in achieving goal of health for all Nursing students should be made aware of the importance of educating the public regarding preservation of human milk at home. Nursing at post-Graduate level have to develop their skill in preparing health teaching materials according to the community's level of understanding Improved and newer techniques have to be used for motivating public.

### **Nursing Practice**

Nursing is a dynamic process, which involves quality based on scientific body of knowledge and dissemination of research knowledge into practice Nursing professionals find the health promotion very relevant because it applies across the span and is useful in of settings. Nursing is a dynamic process, which involves quality based on scientific body of knowledge and dissemination of research knowledge into practice Nursing professionals find the health promotion very relevant because it applies across the span and is useful in of settings Several implications can be drawn from the present study for working women's are unaware about preservation of human milk at home in selected schools.

The extended and expanded roles of professional nurses emphasize more about the Preventing and promotive aspects of the health information can be important through various methods like information Booklet, lecture, mass media, pamphlet, planned teaching program etc. Nurses have position themselves in all areas of community. Hence, nurses should take keen interest in preparing different teaching strategies suitable for the selected schools.

### **Nursing Administration**

The nurse administrators should take active and pivotal role in developing teaching modules. The nurse as an administrator should plan and organize educational programs for nursing personnel and motivating them in conducting preservation of human milk related teaching program for beneficial to the working women's in the selected schools.

### **Nursing Research**

More qualitative and quantitative research studies can be undertaken in the selected schools. In the field of research, the present study helps to utilize the finding and disseminate the knowledge in the field of work. Research studies can be done among working women's in selected schools.

### **RECOMMENDATIONS**

The present study findings revealed that the structured teaching programme as effective in improving knowledge of working women's regarding preservation of human milk at home in selected schools. So, the following recommendations were framed for future study.

1. A similar study can be conducted to improve the knowledge of working women's.
2. A similar study can be done using power point presentation, information booklet, self-instruction module.
3. This study can be replicated on larger sample to generalize the findings.
4. A cross sectional study can be conducted to assess prevalence of preservation of human milk.
5. A comparative study can be done on knowledge regarding preservation of human milk at home among urban and rural areas.

### **SUMMARY**

This chapter deals with analysis and interpretation of the data obtained from the response of 60 sample who were working women's in selected schools. The present study has been taken up to assess the effectiveness of structured teaching programme on knowledge regarding preservation of human milk at home.

### **REFERENCE**

1. Alliyard MR (2002), "Nursing theorist and their work", 5<sup>th</sup> edition, Mosby company, Philadelphia.
2. Silvestre D, Lopez MC, March L, Plaza A, and Martinez-Costa C. Bactericidal Activity of Human Milk:7 Stability during storage. British Journal of Biomedical Science. 2006; 63(2):59-6

3. Lawrence RA. Breastfeeding: A Guide for the Medical Profession, 4th Edition, New York, 2004; 421- 423,516-520
4. La leche league international conference 2012 milk is a living substance so precious, called as "white Blood" .it is essential to store expressed milk properly to maximize its Nutritional and anti-infective qualities.
5. [https://en.wikipedia.org/wiki/Breast\\_milk](https://en.wikipedia.org/wiki/Breast_milk).
6. <http://www.indianpediatrics.net/june2014/469.pdf>.
7. Breastfeeding and use of human milk. Section on breastfeeding Pediatrics 2012; 129: e 827-41.
8. <https://www.unicef.org/documents/baby-friendly-hospital-initiative>.
9. WHO. Infant and young child nutrition. Global strategy on infant and young child feeding. 55th World Health Assembly. A 55/15. Geneva. 2002
10. Kramer MS., Kakuma R. The optimal duration of exclusive breastfeeding: [qlibdoc.who.int/hq/2001/WHO\\_NHD\\_01\\_08.pdf](http://qlibdoc.who.int/hq/2001/WHO_NHD_01_08.pdf).PubMed
11. Margaret C. Neville, Steven M. Anderson, James L. Mc Manaman, Thomas M. Badger, 2012. Lactation and Neonatal Nutrition: Defining and Refining the Critical Questions, 17(2): 167-188. doi: 10.1007/s10911-012-9261-5
12. Jessica L. Thomson, Lisa M, Melissa H. Goodman, Alicia S. Landry and Sarah E. Olender, 2017. 'Low rate of initiation and short duration of breastfeeding in a maternal and infant home visiting project targeting rural, Southern, African American women; International Breastfeeding Journal, <https://doi.org/10.1186/s13006-017-0108-y>
13. Kelsey R. Mirkovic, Cria G. Perrine, Kelley S. Scanlon, Laurence M. 2014. In the United States, a mother's plans for infant feeding are associated with her plans for employment, PMC4594170, J Hum Lact., 30(3): 292-299 doi: 10.1177/0890334414535665
14. Wiener & Wiener, 2011. Barriers to exclusive breastfeeding among mothers. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5005982>
15. Moore & Coty, 2006. Murimi, Dodge, Pope, & Erickson, 2010, lack of support, encouragement, and education from healthcare professionals, family, and friends can become barriers to exclusive breastfeeding. PMID: 22929249
16. Arulkumaran, S, Alokender.c, "Essentials of obstetrics and Gynecology", 1<sup>st</sup> edition, New Delhi, Jaypee brothers.
17. Saroj Amma C P conducted a study on effectiveness of teaching programme on knowledge and practice of Expression breast milk among primi mothers.2008, nightingale journal of nursing p32- 38.
18. P. Ester conducted a study on Effectiveness of Self-Instructional Module in Knowledge on Collection and Storage of Expressed Breast Milk among Mothers of Infants at Selected Children Hospital in Chennai Mary International Journal of Health Sciences & Research ([www.ijhsr.org](http://www.ijhsr.org)) Vol.7; Issue: 4; April 2017
19. Rajeesh C.H, sahana K.S, prakash R.M. saldanha, knowledge and attitude of post-natal lactating mothers regarding human milk donation in our hospital, Indian journal of applied research 2018; 8(3): 34-35
20. Poreddivijaylakshmi T Susheela and D mythili "knowledge attitude and breast-feeding practice of postnatal mothers: A cross sectional survey, international journal of health science Oct 2015 9(4):364-374
21. Rajeesh C.H, sahana K.S, prakash R.M. saldanha, knowledge and attitude of post-natal lactating mothers regarding human milk donation in our hospital, Indian journal of applied research 2018; 8(3): 34-35
22. Barriers to exclusive breastfeeding among mothers. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5005982>
23. [http://www.breastfeedingindia.com/breastfeeding/human\\_milk\\_banks.html](http://www.breastfeedingindia.com/breastfeeding/human_milk_banks.html)
24. <http://indianpediatrics.net/june2014/june-469-474.htm>. & A Parthasarathy et al, IAP textbook of pediatrics published by Jaypee brothers, medical publisher Ltd, New Delhi, India, 6th edition, 2016; 184.
25. <https://documents.mx/documents/breast-feeding-an-ayurveda-perceptive2167-12061000112.html>.
26. Robert conducted a study on assess the level of knowledge on collection and storage of breast milk among working mothers of infants. 2009 Journal of pediatrics p-34-35.
27. <https://www.oxfordlearnerdictionaries.com/definition/english/effectiveness>
28. <https://www.collinsdictionaries.com/definition/english/structuredteachingprogramme>

29. <https://www.oxfordlearnerdictionaries.com/definition/english/knowledge>
30. <https://www.oxfordlearnerdictionaries.com/definition/english/preservation>
31. <https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100157809>
32. <https://www.collinsdictionaries.com/definition/english/workingwomen>
33. Ajesh kumar TK Application of Nursing Theories Jaypee Brother Publication Page No 12 – 14.
34. Preeti Malhotra et al. (2017) conducted a prospective study to assess knowledge, attitude, and breast-feeding practices of working mothers in Punjab, India.
35. Thenisha. A. Study of breastfeeding practices among working and nonworking women attending a maternity care hospital, thiruvallur district, tamilnadu, india. 2017.
36. Ms. Kavita Rawat Evaluate the Effectiveness of a Structured Teaching Program on Exclusive Breastfeeding in Terms of Knowledge and Practice among Primi Caesarean Mothers 2019.
37. Meenu et al 2020 a study to assess the effectiveness of structured teaching program on knowledge regarding exclusive breastfeeding among primi antenatal mothers in gims hospital, greater Noida.
38. [http://publications.aap.org/pediatrics/articlepdf/129/3/e827/1057681/peds\\_2011-3552.pdf](http://publications.aap.org/pediatrics/articlepdf/129/3/e827/1057681/peds_2011-3552.pdf)
39. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3557432/>
40. Yılmaz E, Öcal FD, Yılmaz ZV, Ceyhan M, Kara OF, Küçüközkan T. Early initiation and exclusive breastfeeding: Factors influencing the attitudes of mothers who gave birth in a baby-friendly hospital. Turkish journal of obstetrics and gynecology. 2017 Mar;14(1):1.
41. Davidson, M., London, M., & Ladewig, P. (2012). Olds' maternal-newborn nursing and women's health. New Jersey: Pearson Education Incorporated. Print.
42. Nemours Foundation. (2015). Breastfeeding vs. formula feeding. KidsHealth. [http://kidshealth.org/parent/growth/feeding/breast\\_bottle\\_feeding.html#](http://kidshealth.org/parent/growth/feeding/breast_bottle_feeding.html#)
43. <http://www.lalecheleague.org/faq/alcohol.html>
44. McCall, S. (2014). Nursing in public: What US mothers faced from colonial times until today. Breastfeeding USA. Retrieved from <https://breastfeedingusa.org/content/article/nursing-public-what-us-mothers-faced-colonial-times-until>
45. <http://americanpregnancy.org/firstyearoflife/breastfeedingandbottle.html>
46. United States Breastfeeding Committee. (2013). Breastfeeding saves dollars and makes sense: Help "make change" for our nation's families. Retrieved from <http://www.usbreastfeeding.org/LegislationPolicy/BreastfeedingAdvocacyHQ/BreastfeedingSavesDollarsandMakesSense/tabid/339/Default.aspx>
47. SubinMariya Jacob, Sujatha R. An Exploratory Study on Knowledge and Attitude of Fathers towards Breastfeeding in selected Hospitals at mangalore. International Journal of Nursing Education. vol.5, no.1,2013
48. Ystrom E. Breastfeeding cessation and symptoms of anxiety and depression: a longitudinal cohort study. BMC Pregnancy Childbirth.2012; 23;12:36(PubMed)
49. Dr.Sam Oddieonly,2013. Breastfeed babies admitted to hospital with dehydration or weight loss rarely suffered serious damage, researchers find. Breastfeedingmyths-dispelled.www.theguardian.com
50. Shetty B. An observational study of factors promoting breastfeeding in nursing mothers and pregnant women
51. Sinhababu A. et al., (2017) Conducted a cross-over study to investigate whether breast pumping using a hospital-grade electric pump was more effective in maximizing the available milk volume and more comfortable than manual expression in the first 48 hours after birth.
52. Jane Emily Beatrice effectiveness of simulation-based teaching on manual expression of breast milk among mothers of babies admitted in the neonatal unit, South India 2019.
53. Mayla S Borges 2017 Quality of human milk expressed in a human milk bank and at home.
54. Larson E, Zuill R, Zier V, Berg B. Storage of human breast milk. Infect Control. 1984 Mar;5(3):127-30. doi: 10.1017/s0195941700059981. PMID: 6561179.
55. Biagioli F. Returning to work while breastfeeding. Am Fam Physician. 2003 Dec 1;68(11):2201-8. PMID: 14677665.

56. [https://www.researchgate.net/publication/333367077\\_Innovative\\_Techniques\\_of\\_Processing\\_Human\\_Milk\\_to\\_Preserve\\_Ke\\_y\\_Components](https://www.researchgate.net/publication/333367077_Innovative_Techniques_of_Processing_Human_Milk_to_Preserve_Ke_y_Components)
57. [https://ejmcm.com/article\\_8283\\_7fc4e702a53862b47d2593e2922e4b41.pdf](https://ejmcm.com/article_8283_7fc4e702a53862b47d2593e2922e4b41.pdf)
58. Doshmangir, L., Naghshi, M., & Khabiri, R. (2019). Factors Influencing Donations to Human Milk Bank: A Systematic Review of Facilitators and Barriers. In *Breastfeeding Medicine* (Vol. 14, Issue 5, pp. 298–306). Mary Ann Liebert Inc. <https://doi.org/10.1089/bfm.2019.0002>
59. [https://www.researchgate.net/publication/328948906\\_Perception\\_of\\_donor\\_breast\\_milk\\_and\\_determinants\\_of\\_its\\_acceptability\\_among\\_mothers\\_in\\_a\\_developing\\_community\\_A\\_cross-sectional\\_multi-center\\_study\\_in\\_south-east\\_Nigeria](https://www.researchgate.net/publication/328948906_Perception_of_donor_breast_milk_and_determinants_of_its_acceptability_among_mothers_in_a_developing_community_A_cross-sectional_multi-center_study_in_south-east_Nigeria)
60. Coutsoudis, I., Adhikari, M., Nair, N., & Coutsoudis, A. (2011). Feasibility and safety of setting up a donor breastmilk bank in a neonatal prem unit in a resource limited setting: An observational, longitudinal cohort study. *BMC Public Health*, 11, 356. <https://doi.org/10.1186/1471-2458-11-356>
61. Safeena Beevi SS., et al. “Assessment of Knowledge regarding Human Breast Milk Bank among the Nursing Officers in JIPMER Puducherry.” *Medicon Medical Sciences* 1.2 (2021): 13-20.
62. Velmurugan, Sharumathi<sup>1</sup>; Prabakar, Vetriselvi<sup>1</sup>; Bethou, Adishivam<sup>2</sup>; Ramamoorthy, Lakshmi<sup>1</sup>. Perceptions on human milk donation and banking: Maternal optimism. *Journal of Family Medicine and Primary Care* 9(11): p 5820-5821, November 2020. | DOI: 10.4103/jfmprc.jfmprc\_998\_20
63. Ikonen R, Paavilainen E, Helminen M, Kaunonen M. Preterm infants’ mothers’ initiation and frequency of breast milk expression and exclusive use of mother's breast milk in neonatal intensive care units. *Journal of clinical nursing*. 2018 Feb;27(3-4): e551-8.
64. St. Fleur R, Petrova A. Knowledge and perception of breastfeeding practices in Hispanic mothers in association with their preferred language for communication. *Breastfeeding Medicine*. 2014 Jun 1;9(5):261-5.
65. Nirali Tank, Rajshree Yadav, Jeenath Justin Doss K. Effectiveness of Structured teaching programme on Knowledge regarding the expressed Breast milk among postnatal working mothers in selected area in Junagadh District. *Asian J. Nursing Education and Research*. 2021; 11(1):23-24. doi: 10.5958/2349-2996.2021.00006.9
66. Buvaneswari T, Dash M. Effectiveness of Video Assisted Teaching Method on Knowledge and Skill Regarding Hand Expression of Breast Milk and Cup Feeding among the mothers of Low-Birth-Weight Baby. *Innov J Nurse Healthc*. 2019;5(1):1-5. <http://innovationalpublishers.com/Journal/ijnh>
67. Mary Easter P. 2017. Effectiveness of Self-Instructional Module in Knowledge on Collection and Storage of Expressed Breast Milk among Mothers of Infants at Selected Children Hospital in Chennai; *International Journal of Health Sciences & Research*, Vol.7; Issue: 4
68. Renuka, knowledge and attitude regarding the storage of breast milk for the infants among staff nurses at selected hospitals of gwalior city, *Int. J* 2018. *Adv. Res.* 6(7), 666-672.
69. Kamala K.N et. Al. 2019. A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Expression and Storage of Breast Milk Among Antenatal Mothers, Attending Antenatal Clinic at H.S.K Hospital and Research Center, Bagalkot, Karnataka.
70. Miranda M, Gormaz M, Romero FJ, Silvestre D. Estabilidad de la capacidad antioxidante y pH en leche humana refrigerada durante 72 horas: estudio longitudinal [Stability of the antioxidant capacity and pH of human milk refrigerated for 72 hours: longitudinal study]. *Nutr Hosp*. 2011 Jul-Aug;26(4):722-8. Spanish. doi: 10.1590/S0212-16112011000400009. PMID: 22470016.
71. Sheen W, Ahmed M, Patel H, Codipilly CN, Schanler RJ. Is the Antioxidant Capacity of Stored Human Milk Preserved? *Breastfeed Med*. 2021 Jul;16(7):564-567. doi: 10.1089/bfm.2020.0407. Epub 2021 Mar 15. PMID: 33728983.
72. Fogleman AD, Meng T, Osborne J, Perrin MT, Jones F, Allen JC. Storage of Unfed and Leftover Mothers' Own Milk. *Breastfeed Med*. 2018 Jan/Feb;13(1):42-49. doi: 10.1089/bfm.2016.0168. Epub 2017 Dec 13. PMID: 29235902.
73. Ahrabi AF, Handa D, Codipilly CN, Shah S, Williams JE, McGuire MA, Potak D, Aharon GG, Schanler RJ. Effects of Extended Freezer Storage on the Integrity of Human Milk. *J Pediatr*. 2016 Oct; 177:140-143. doi: 10.1016/j.jpeds.2016.06.024. Epub 2016 Jul 14. PMID: 27423174.

74. Orbach R, Mandel D, Mangel L, Marom R, Lubetzky R. The Effect of Deep Freezing on Human Milk Macronutrients Content. *Breastfeed Med.* 2019 Apr;14(3):172-176. doi: 10.1089/bfm.2018.0226. Epub 2019 Feb 1. PMID: 30707603.
75. Beatriz M. Reyes-Foster et. Al. 2016 Human Milk Handling and Storage Practices Among Peer Milk-Sharing Mothers.
76. Peila, C. (2018) Effects of pasteurization and refrigerated storage on human milk neurobiomarkers concentrations.
77. Caroline J Chantry 2019 Feasibility of using flash-heated breastmilk as an infant feeding option for HIV-exposed, uninfected infants after 6 months of age in urban Tanzania.
78. Aleksandra Wesolowska 2019. Innovative techniques of processing human milk to preserve. [leksandra.wesolowska@wum.edu.pl](mailto:leksandra.wesolowska@wum.edu.pl)
79. <https://www.jpai.in/article.asp?issn=WKMP0206;year=2017;volume=6;issue=2;spage=111;epage=115;aulast=Bharadva;type=0>
80. Grazziotin MCB, Grazziotin AL, Vidal NM, Freire MH de S, da Silva RPGVC. Analysis of the Storage Methods for Raw Human Milk from Mothers with Infants Admitted to a Neonatal Intensive Care Unit, According to Brazilian Regulations. *Journal of Human Lactation.* 2016;32(3):446-454. doi:10.1177/0890334416647710
81. Edemba, P.W., Irimu, G. & Musoke, R. Knowledge attitudes and practice of breastmilk expression and storage among working mothers with infants under six months of age in Kenya. *Int Breastfeed J* 17, 33 (2022). <https://doi.org/10.1186/s13006-022-00469-6>
82. [https://www.worldwidejournals.com/international-journal-of-scientific-research-\(IJSR\)/recent\\_issues\\_pdf/2020/July/a-study-to-assess-the-knowledge-regarding-expression-and-storage-of-breast-milk-among-working-lactating-women-in-postnatal-ward-in-rajiv-gandhi-government-womens-and-childrens-hospital-puducherry\\_July\\_2020\\_7701513639\\_4325664.pdf](https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/recent_issues_pdf/2020/July/a-study-to-assess-the-knowledge-regarding-expression-and-storage-of-breast-milk-among-working-lactating-women-in-postnatal-ward-in-rajiv-gandhi-government-womens-and-childrens-hospital-puducherry_July_2020_7701513639_4325664.pdf)
83. [https://www.researchgate.net/publication/356839222\\_a\\_study\\_to\\_assess\\_the\\_effectiveness\\_of\\_selfinstructional\\_module\\_on\\_knowledge\\_regarding\\_expression\\_and\\_storage\\_of\\_breast\\_milk\\_among\\_working\\_mothers\\_of\\_infants\\_in\\_dachnipora\\_block\\_of\\_district\\_anantnag](https://www.researchgate.net/publication/356839222_a_study_to_assess_the_effectiveness_of_selfinstructional_module_on_knowledge_regarding_expression_and_storage_of_breast_milk_among_working_mothers_of_infants_in_dachnipora_block_of_district_anantnag)
84. <https://en.wikipedia.org/wiki/methodology>
85. Denis F Polit, Cheryl tatano beck. *Nursing Research Generating and Assessing evidence for nursing Practice.* 10<sup>th</sup> edition. New Delhi: Wolters Kluwer India: 2017, page no. 11, 744, 743, 250.
86. Basvanthappa B.T. *Nursing research.* 2<sup>nd</sup> edition New Delhi: Jaypee Publication; 2010. Page no 43, 164, 442, 469, 470.
87. Sharma S.K. *Book of nursing research and statistics.* 3<sup>rd</sup> edition. New Delhi: Elsevier Publication; 2017 Page No. 80,164,251.
88. Denise F Polit, Bernadette P. Hungler. *Nursing Research, Principles and Methods.* 5<sup>th</sup> edition. Philadelphia: J.B. Lippincott Company; 1995. Page no. 656
89. Sommer R and Sommer B.A *Practical guide to Behavioral Research Tools and Techniques.* 5<sup>th</sup> edition. Oxford University press; 2002; Pg. no. 9
90. Wilson FL, Mayeta-Peart A, Parada-Webster L, Nordstrom C. Using the teach back method to increase maternal immunization literacy among low-income pregnant women in Jamaica: A pilot study. *Journal of Pediatric Nursing,* 2012 Oct 1;27(5):451-459.