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Research article

Self-instruction module is effective in improving knowledge of mothers regarding expression and storage of breast milk

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Abstract

Breast milk is often referred to as "liquid gold," and therefore a key aspect of self reliance and primary health care. By many scientific studies and researches it is proved that there is no substitute for breast milk. Babies who are breast fed have 30% less chances or are at risk of illness than the bottle fed babies. It was aimed to assess the effect of self instructional module on knowledge regarding expression and storage of breast milk among postnatal working women residing in selected areas of PCMC, Pune city. The study comprised of 60 postnatal working women working in the selected areas of Pimpri chinchwad Muncipal Corporation, Sant Tukaram Nagar, Vallabh Nagar, Nehru Nagar, Balaji Nagar, Landewadi, Jijamata hospital, Kamat hospital of Pune city. Data collection commenced after the prior permission was taken from Jijamata hospital and Kamat hospital. The data collection was done from 2nd October 2010 to 2nd November 2010. On day one (pre-test day) the purpose of the study was explained to each postnatal working woman and the confidentiality of her response was assured. After pre-test on the same day self instructional module was administered to the subjects. Post-test was conducted on the 7th day. The average knowledge score of postnatal working women in pre test was 6.25 and posttest average knowledge score was 17.68. There was a significant association between education, occupation, per month family income, the importance of expression and storage of breast milk and previous information about the expression and storage of breast milk. The self instructional module on the expression and storage of breast milk is proved to be effective in imparting the knowledge and creating awareness.

Keywords: Breast milk, knowledge, practices, self instructional module, nursing.

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1. Introduction

Breast milk is often referred to as "liquid gold," and storing it safely is the key. There is a lot of conflicting research about the advantages and disadvantages of storage containers made from particular materials. The first milk is the most suitable food for the newborn. It is thick and yellow coloured, *the Shaastras* call it "Peeyusha" (equal to amrit, the 'liquor of life') and western science uses the word colostrums, infants' first immunization. For most of the children breastfeeding makes the difference between life and death and it is the infants' passport to life. Women with infants are the fastest growing segment of today's labor force. 50% of women who are employed when they become pregnant return to work by the time their children are three months old. The studies indicate that the women, who continued to breastfeed while working, perform better because of less baby related illness, compared with women who do not breastfeed. Breastfeeding is therefore a key aspect of self reliance and primary health care. [1] Mother's milk is a gift of nature for the newborn. By many scientific studies and researches it is proved that there is no substitute for breast milk. Babies who are breast fed have 30% less chances or are at risk of illness than the bottle fed babies. A barrier for breastfeeding women working full-time outside the home: breast milk expression in the workplace. Mothers express breast milk about twice a day when

infants are 4 and 6 months old, with a significant decline in frequency comparing the 2 age groups. Most mothers spend 1 hour or less expressing breast milk when infants are 3 (82%) or 6 months old (96%), with a significant difference between the 2 age groups. Mothers of younger infants were no more likely to work fewer days per week than mothers of older infants. Most women can express breast milk for 3 and 6 month-old infants in less than an hour, distributed in about 2 separate portions, in an employment environment supportive of breastfeeding. [2]
Breast feeding is a natural process that seems to have been adversely affected by the modernization of the society. Maternal education, race, and socioeconomic factors are also known to influence breastfeeding decisions. [3]. Breast feeding promotion network of India (BPNI) (2002) says, infants aged (0-5) months who are not breast fed have seven fold and fivefold increased risk of death from diarrhoea compared to infants who are exclusively breastfed. To reduce the infant and childhood mortality and to improve health and development of infants and young children, the 10^{th} five year plan of Government of India (2003-2007) had set a target, to increase EBF rate to 80% during first 6 months from the current level of around 40. 5, and increase rate of initiation of breast feeding within one hour to 50% from the current level of 15% and increase rate of complementary feeding from 33.5% to 75%.

However, mothers of vulnerable infants, such as preterm infants, encounter a variety of unique breastfeeding barriers and challenges that result in a decreased rate of breastfeeding in preterm compared to term infants. As an example, in Massachusetts, breastfeeding initiation rates were 77, 70, and 63 percent in term infants, infants born between 32 and 36 weeks gestation, and those born between 24 and 31 weeks, respectively. For extremely premature infants, a major barrier is their inability to breastfeed effectively for some time after delivery, which requires their mothers to establish and maintain milk production by milk expression either by hand or by use of a pump. As a result, efforts need to be made to support both breast milk expression and breastfeeding for the maternal-preterm infant dyad, because the benefits of human milk are well-established in these infants. [4]

The vast majority of mothers can and should breastfed, the infants. For those few health situations where infants cannot, or should not, be breastfed, the choice of the best alternative – expressed breast milk from an infant's own mother, breast milk from a healthy wet-nurse or a human-milk bank, or a breast-milk substitute fed with a cup, which is a safer method than a feeding bottle and teat – depends on individual circumstances.

The WHO recommends exclusive breastfeeding for the first six months of life, after which "infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond.

Several methods can be used to impart knowledge. One way of imparting knowledge is to deliver it as self – instruction. It allows a person to take knowledge at one's own pace and whenever possible. It is available easily for further revisions based on future researchers. For these reasons, the use of self-instruction is increasing. Self-instruction can be disseminated by many ways, viz. booklets, cassettes, compact discs etc.

The aim of self-education is to create awareness among postnatal working women and motivate them to practice better techniques of breast milk expression and storage to reduce the maximum number of Under-five deaths and under-weight children in the world and also to monitor postnatal women's health status. Imparting health information can create awareness. Health information can be imparted in various ways such as by posters, pamphlets, mass education and Self instructional module.
India is home for maximum number of under-five deaths and underweight children in the world. In 2006, for the first time, the number of children in the world dying before fifth birthday fell below 10 million, to 9.7 million annually.
Keeping in the current status of infant feeding practices, it is imperative that postnatal working

women be educated about the importance and value of breast feeding motivating them to practice the expression and storage practices of breast milk. There were various survey studies conducted among postnatal working women to find out their knowledge level, but no such study has been conducted among working women to find out the effect of self instructional module regarding expression and storage of breast milk which will help create awareness about various techniques and importance of expression and storage of breast milk.

Hence we decided to assess the effect of self instructional module on knowledge regarding expression and storage of breast milk among postnatal working women residing in selected areas of PCMC, Pune city.

Patients and methods

The study comprised of 60 postnatal working women working in the selected areas of Pimpri chinchwad Muncipal Corporation, Sant Tukaram Nagar, Vallabh Nagar, Nehru Nagar, Balaji Nagar, Landewadi, Jijamata hospital, Kamat hospital of Pune city. All the subjects fulfilled inlusion criteria including: Postnatal working women whose postnatal period was from parturient to seventh day, understanding of Marathi/English language, willingness to participate in the study and women underwent normal vaginal delivery and caesarean, both primipara and multipara. Women who did not fulfill the inclusion criteria were excluded from study. Data collection commenced after the prior permission was taken from Jijamata hospital and Kamat hospital. The data collection was done from 2nd October 2010 to 2nd November 2010. On day one (pre-test day) the purpose of the study was explained to each postnatal working woman and the confidentiality of her response was assured. After pre-test on the same day self instructional module was administered to the subjects. Post-test was conducted on the 7th day.

Data collection technique and instruments

Structured knowledge questionnaires were prepared for assessing the knowledge regarding expression and storage of breast milk.

The structured knowledge questionnaire consisted of three following: **Section I** consisted of 9 items on demographic variables i.e. age, education, occupation, type of family (nuclear, joint and extended family), information about expression and storage of breast milk; **Section II** comprised of 20 knowledge items with a maximum score of 20 categorized under two broad areas and one score was given to each correct response and zero for the wrong response; **Section III** consisted of self instructional module (Anatomical parts of breast, Importance of breast milk, Methods of expression- Methods, cleanliness, advantages and disadvantages, after care, Storage of breast milk–techniques, equipments, care of equipments, duration.

Validity and reliability of the questionnaire

To ensure content validity, the tool was submitted to 28 experts along with the blue print. The experts were selected based on their clinical expertise, experience and interest in the problem being studied. They were requested to give their opinion on the appropriateness and relevance of items in the tool. As a whole the suggestions and comments of experts included grammatical corrections of the sentences and adding few more questions on expression and storage of breast milk. The modified tool contained 20 items after incorporating the suggestions. After validation of content, an expert in Marathi language translated the tool from English to Marathi. The reliability was determined by administering structured knowledge questionnaire to 10 selected postnatal working women from the selected areas of PCMC (Pimpri and Bhosari). The reliability co-efficient was calculated, using the split half method (Chronbach's alpha method). The items were coded and the reliability was calculated. The reliability co-efficient was found to be 0.80 which is quite high to conclude that the tool was reliable.

Pilot study

A pilot study was conducted from 27th September 2010 to 2nd October 2010 to assess the feasibility of the study, to present the self instructional module, and to decide on a plan for a statistical

analysis. The study was conducted on 06 postnatal working women. Pretest was given on the 1st day, and then self instructional module was administered, and post-test was taken on the 7th day using the same tool. After post test the data was analyzed with the help of descriptive and inferential statistics. Findings indicated that self instructional module was effective for postnatal working women in increasing their knowledge regarding expression and storage of breast milk.

Statistical analysis

Demographic variables were analyzed in terms of frequency and percentages. Data were presented as mean ± SD. Paired t-test was used to determine the significance of mean difference between mean pre-test knowledge scores and mean post-test knowledge scores. Association between demographic variables and pre-test knowledge score was assessed using ANOVA. P value less than 0.05 considered significant.

Results

Most of the postnatal working women i.e. about 43.3% were in the age group between 30 to 34 years and the remaining 1.7% of them was of age between 24 to 29 years. Greater percentage of postnatal working women i.e. 56.7% were graduates and 10% of them were post-graduates. 56.7% of the postnatal working women were from joint family and the remaining 43.3% were from nuclear families. Most of the postnatal working women i.e. 68.3% were doing service, 11.7% were laborers and 20% of them had other occupations. Most of the postnatal working women i.e. 40% had family income per month in the group of less than 5000 Rupees while 13.3% of them had family income above 15001. 56.7% of postnatal working women thought that expression and storage of breast milk is important and 43.3% thought it is not important. 53.3% of postnatal working women did not have previous information about expression and storage of breast milk and the remaining 46.7% had previous information about the same. Among those 75% of them got the information from friends or relatives while 7.1% from mass media. All 100% of them were from urban area. About 55% of them had parity one and 3.3% with parity four. Detailed analysis has been shown in table 1.

Self-instruction module is effective in improving knowledge

The majority i.e. 68.3% of postnatal working women in pre-test of study group had poor knowledge score (0-7), 31.67% of postnatal working women in pre-test of study group were having average knowledge score (8-14), and not a single postnatal working women in pre-test study group had good knowledge score (15-20), whereas in post-test the majority i.e. 98.33% of the postnatal working women had good knowledge score (15-20) and 1.67% postnatal working women in post-test of study group were having average knowledge score, which indicated that the self instructional module was effective (table 2).

The knowledge scores of the samples show a marked increase as seen in the post-test score of the study group, which indicated that the self instructional module was effective in increasing the knowledge of the samples regarding expression and storage of breast milk among postnatal working women.

Self-instructional module is effective on individual variables

The average knowledge pre test score of postnatal working women on anatomical parts of breast, meaning and importance of breast feeding was only 1.77 but in the post test it was more i.e. 3.90. The average knowledge pre test score of postnatal working women on techniques of expression of breast milk was 1.62 and in post test it was more i.e. 5.63. The average knowledge pre test score of postnatal working women on storage, handling and thawing of breast milk was 1.57 and in post test it was more i.e. 4.33. The average knowledge pre test score of postnatal working women on feeding the frozen milk and cleanliness in expression and storage of breast milk was 1.30 and in post test it was more i.e. 3.82. Since in all areas of knowledge P value was less than 0.05 (P value = 0.000) difference in average score was statistically significant.

Table 1: Demographic variables

SN	Demographic variable	Category	Number of Subjects	Subjects (%)
1	Age (Years)	18 to 23	24	40.0%
		24 to 29	1	1.7%
		30 to 34	26	43.3%
		Above 35	9	15.0%
2	Education	Upto 10th	20	33.3%
		Graduation	34	56.7%
		Post-graduation	6	10.0%
		Others	0	0.0%
3	Type of Family	Nuclear family	26	43.3%
		Joint family	34	56.7%
		Extended family	0	0.0%
4	Occupation	Laborer	7	11.7%
		Service	41	68.3%
		Any other	12	20.0%
5	Family Income (Rs.)	<5000	24	40.0%
		5001 - 10000	19	31.7%
		10001 - 15000	9	15.0%
		>15001	8	13.3%
6	Do you think expression and storage of breast milk is important?	No	26	43.3%
		Yes	34	56.7%
7	Do you have previous information about expression and storage of breast milk?	No	32	53.3%
		Yes	28	46.7%
	If yes, from where?	Friends/ Relatives	21	75.0%
		Health professionals	5	17.9%
		Mass medias	2	7.1%
8	Area/ Address of localized place	Urban area	60	100.0%
		Rural area	0	0.0%
9	Parity	P1	33	55.0%
		P2	19	31.7%
		P3	6	10.0%
		P4	2	3.3%

Table 2: Distribution of overall knowledge score in frequency and percentage obtained by the study group

S. No.	Knowledge Score	Pre-test		Post-test	
		Frequency	Percentage	Frequency	Percentage
1.	0-7 (Poor)	41	68.33%	_	_
2.	8-14 (Average)	19	31.67%	1	1.67%
3.	15-20(Good)	_	_	59	98.33%
	Total	60	100.00%	60	100.00%

A paired t-test was applied to compare the difference between the average scoring of before and after self instructional module. The data provided sufficient evidence to conclude that postnatal working women who had received self instructional module on the expression and storage of breast milk had higher mean knowledge scores in post-test than in pre-test (figure 1).

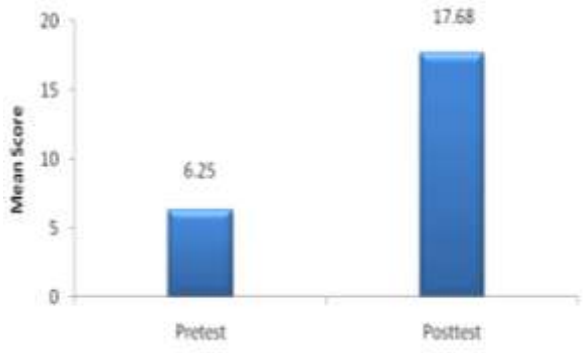


Fig. 1: Bar graph showing the average knowledge score in pre-test and posttest

Self-instructional module is effective on individual variables

The average knowledge pre test score of postnatal working women on anatomical parts of breast, meaning and importance of breast feeding was only 1.77 but in the post test it was more i.e. 3.90. The average knowledge pre test score of postnatal working women on techniques of expression of breast milk was 1.62 and in post test it was more i.e. 5.63. The average knowledge pre test score of postnatal working women on storage, handling and thawing of breast milk was 1.57 and in post test it was more i.e. 4.33. The average knowledge pre test score of postnatal working women on feeding the frozen milk and cleanliness in expression and storage of breast milk was 1.30 and in post test it was more i.e. 3.82. Since in all areas of knowledge P value was less than 0.05 (P value = 0.000) difference in average score was statistically significant

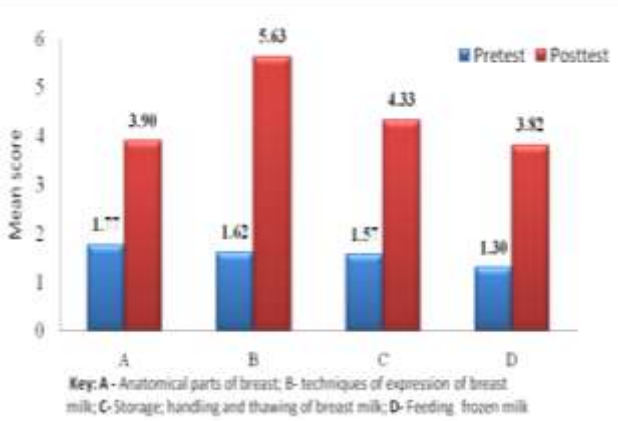


Fig. 2: Bar graph shows the area wise comparison of average pre-test and posttest knowledge score

Association between knowledge score and demographic variables

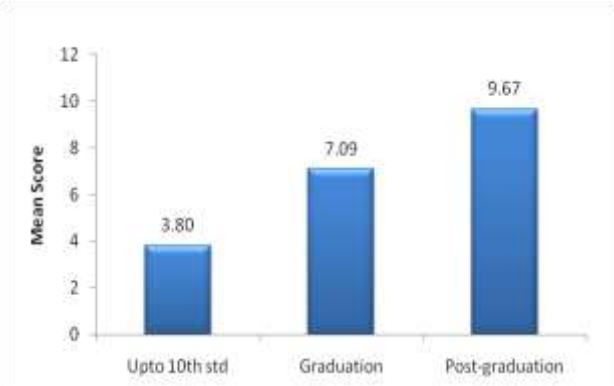
Association analysis showed that p-values corresponding to demographic variables education, occupation, per month family income, importance of expression and storage of breast milk and previous information about expression and storage of breast milk were less than 0.05, hence null hypothesis was rejected (table 3). There was also significant difference observed between education and knowledge of postnatal women (Fig 3).

Table 3: Association between knowledge score and demographic variables in the study group

S N	Demographic variable	F	P	Remark
1	Age	0.95	0.519	No Association
2	Education	16.7	0.000	Association (at 10% L.O.S.)
3	Type of Family	0.38	0.537	No Association
4	Occupation	8.41	0.001	Association (at 5% L.O.S.)
5	Per month family income	2.95	0.015	Association (at 10% L.O.S.)
6	Do you think expression and storage of breast milk is important?	6.59	0.013	Association (at 10% L.O.S.)
7	Do you have previous information about expression and storage of breast milk?	13.99	0.000	Association (at 5% L.O.S.)
8	Area/ Address of localized place	1.02	0.52	No Association
9	Parity	1.4	0.252	No association

LOS: Level of Significance

Figure 3: Bar graph for relationship of knowledge and education score



Effect of occupation and family income on knowledge score

The service category subjects had maximum knowledge score of 6.98, while the labourer category had a lesser knowledge score i.e. 2.29. There was an association between the type of occupation and knowledge of postnatal working women at 5% level of significance (P= 0.001) (table 4). A significant impact of family income on knowledge was also observed (table 5).

Table 4: Description of association between knowledge score and occupation

S. No.	Occupation	Average score
1.	Labourer	2.29
2.	Others	6.08
3.	Service	6.98

Table 5: Description of association between knowledge score and per month family income

S N	Per month family income	Average mean score
1	<5000 Rs.	4.58
2	5000 - 10000	6.68
3	10001 – 15000	7.67
4	>15000	8.63

Postnatal working women whose opinion about the expression and storage of breast milk was 'No' had only an average score of 5.12 whereas the postnatal working women whose opinion was 'Yes' had an average score of 7.12. Postnatal working women who thought that expression and storage of breast milk was important had higher knowledge score than those who did not think it was important (fig 4). There was a significant association between the previous information about the expression and storage of breast milk and the knowledge of postnatal working women at 5% level of significance (P= 0.000)

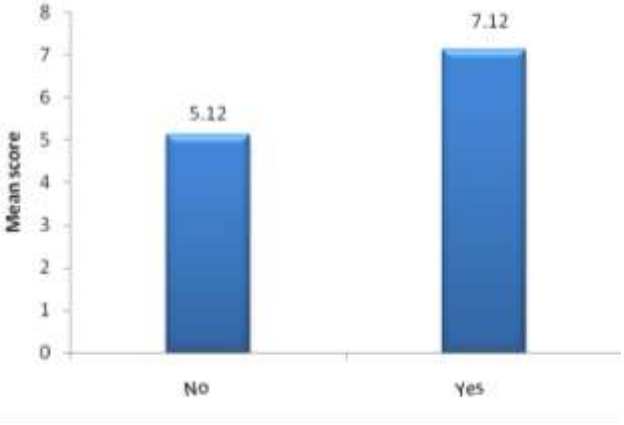


Figure 4: Bar graph showing the relationship between knowledge and opinion about the importance of expression and storage of breast milk

Table 6: Description of association between knowledge score and previous information about the expression and storage of breast milk

S N	Previous information about the expression and storage of breast milk	Average score
1	No	4.97
2	Yes	7.71

Table no. 6 shows that the postnatal working women not having previous information about the expression and storage of breast milk are having only a knowledge score of 4.97 whereas postnatal working women having previous information about the expression and storage of breast milk have a knowledge score of 7.71..

The postnatal working women who received information about the expression and storage of breast milk from friends/relatives had a knowledge score of 7.00, those who received it from the health professionals had a better knowledge score i.e. 9.2 whereas those who received from mass medias had the maximum knowledge score i.e. 11.5. Postnatal working women who had received information from mass media had more knowledge score than those who received information from friends/Relatives or the health professionals. Those who received information from friends/relatives had the least knowledge regarding the expression and storage of breast milk.

Discussion

The findings of the study showed that majority of the postnatal working women (40%) were from the age group between 18 to 23 years and about 1.7% were in the age group between 24 to 29 years. The study shows that 69.69% mothers were in the age group of 21-30 years. About 56.7% of postnatal working women were graduates. In similar study they find that 15.15% had completed graduation. As per the type of family 56.7% were from joint families. In similar study they find that 69.69% come from joint family. [5]

About 68.33% of postnatal working women were having poor knowledge score. In similar study they find that about 47% of postnatal working women had poor knowledge in expression and storage of breast milk. [6]

The posttest knowledge score of postnatal working women was 17.68 which were higher than the pre-test score of 6.25 after administration of self instructional module. In similar study they find that mean post test score of 88.79% was significantly higher than the mean pre-test score of 25.58% after administration of self instructional module.[5] The paired t value (28.18) was greater than the table value at 0.05 level of significance. This indicated that Self instructional module was significantly effective in increasing the knowledge. In similar study they

find that the paired t value (67.34) is greater than the table value at 0.05 level of significance. This indicated that self instructional module was significantly effective in increasing the knowledge. [7]

In the present study the investigator found that there was an association between the knowledge and education, occupation, per month family income, importance of expression and storage of breast milk and previous information about expression and storage of breast milk. There was no significant association between knowledge and age, type of family, area and parity.

Conclusion

The main aim of the present study was to assess the effect of self instructional module on the knowledge regarding the expression and storage of breast milk among postnatal working women residing in selected areas of PCMC, Pune City. The self instructional module was found to be significantly effective in improving knowledge regarding the expression and storage of breast milk of postnatal working women.

Implication

The findings of the study have implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing practice

The assessment of postnatal working women's knowledge and the practice of expression and storage of breast milk followed to provide exclusive breastfeeding, and imparting knowledge in areas where it is lacking. Health education is an important nursing responsibility. A Nurse works in various settings like hospitals, community health centers etc. and therefore should make use of the opportunities to assess the practice of expression and storage of breast milk. So it is a nurse's duty to bring this problem related to expression and storage of breast milk into focus and gain information about it to plan further actions.

The nurse working in a hospital setting both in inpatient and outpatient services, play an important role in assessing the knowledge and difficulties related to the expression and storage of breast milk and which can help to plan further interventions. They can carry out health education both on one to one basis. The nurse should assess the skill of postnatal working women in the expression of breast milk. Nurses can provide health education, demonstrate, teach and counsel to promote awareness, improve skill in the expression and storage of breast milk.

Nursing Education

With changing health care trend, nursing education must emphasize on primary health care approach focusing on "prevention is better than cure" and promotion of health. Nursing education empowers the prospective nurses to be well prepared to assist client and community at large, to develop self-care potentialities.

Nursing administration

There is a genuine need for continuing education for nurses, particularly for those who are working in Hospital Departments dealing with postnatal working women and babies. In India at present, short term education courses are conducted at times for the practicing nurses. As a part of administration, the nurse administrator plays a vital role in educating the postnatal working women, community health nurses, community health workers and student nurses. As a nurse administrator the nurse has to develop baby friendly hospitals. The findings of the study should be used as a basis of in-service education programs for the nurses so as to make them aware of the knowledge regarding the expression and storage of breast milk and improve skills in the community.

Nursing research

There is a need for Extensive and Intensive Nursing Research in this area so that strategies for educating people on the expression and storage of breast milk and reducing the Infant mortality rate. The Nurse researcher should be able to conduct the research on various aspects of awareness about expression and storage of breast milk so as to generate more scientific data. Findings of this will provide baseline data for

improving knowledge and skill of postnatal working women. All this information can be used for further research.

Recommendations

Keeping in view the findings of the study, the recommendations were made to conduct studies with large number of patients, using other methods of teaching, using a control group etc.

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