

Effectiveness of Self-Instructional Module on Collection and Storage of Expressed Breast Milk Among Primi Antenatal Mothers, Tirupati

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Abstract

Introduction: Breastfeeding is a special gift from a mother to her baby and is considered the most natural, economical and complete form of infant feeding. Breast milk provides ideal nutrition, immunity and protection against infections. Expressed breast milk is highly useful when the mother is separated from the baby due to maternal illness, employment, hospitalization of the neonate, breast engorgement, difficulty in direct breastfeeding or other temporary conditions. Correct knowledge regarding collection, hygiene, storage, thawing and feeding of expressed breast milk is essential to maintain its safety and nutritional quality. Primi antenatal mothers, being first-time mothers, often lack adequate awareness and confidence regarding expressed breast milk practices. The present study was conducted to evaluate the effectiveness of a self-instructional module on collection and storage of expressed breast milk among primi antenatal mothers.

Methodology: A pre-experimental one-group pre-test post-test research design was adopted. A total of 100 primi antenatal mothers were selected by purposive sampling technique from Government Maternity Hospital, Tirupati. Data were collected using a semi-structured interview schedule. After the pre-test, a self-instructional module covering meaning, importance, hygienic collection, storage methods, duration of storage, thawing, warming and feeding of expressed breast milk was distributed to the mothers. Post-test was conducted after five days using the same questionnaire. Data were analyzed using descriptive and inferential statistics.

Results: The study findings revealed that the overall post-test knowledge mean score was 16.13 ± 0.95 , which was higher than the pre-test knowledge mean score of 5.69 ± 2.23 . The mean difference was 10.44. The calculated paired 't' value was 45.094, which was statistically

significant at 0.05 level. This indicates that the self-instructional module was effective in improving knowledge regarding collection and storage of expressed breast milk among primi antenatal mothers.

Conclusion: The study concluded that the self-instructional module was effective in creating awareness and improving knowledge among primi antenatal mothers regarding collection and storage of expressed breast milk. Health education through simple written modules can be an effective strategy in antenatal clinics to promote safe infant feeding practices.

Key Terms: Effectiveness, Self-instructional module, expressed breast milk, primi antenatal mother.

Introduction

Breastfeeding is one of the most important foundations of child survival, growth and development. It is not only a biological process but also an emotional bond between mother and baby. Breast milk is a complete food for the newborn because it contains all essential nutrients in the correct proportion, including proteins, fats, carbohydrates, vitamins, minerals, enzymes, hormones, immunoglobulins and living protective cells. It protects the baby from infections such as diarrhoea, pneumonia, otitis media and other respiratory illnesses. It also supports neurodevelopment, emotional security and healthy growth.

The World Health Organization and other health agencies recommend early initiation of breastfeeding within one hour of birth and exclusive breastfeeding for the first six months of life. However, direct breastfeeding may not always be possible. In many situations, a mother may be temporarily separated from her baby due to medical, social or occupational reasons. Babies admitted to neonatal intensive care units, preterm babies, low birth weight babies, babies unable to suck effectively, or babies whose mothers are ill may not be able to breastfeed directly. In such situations, expressed breast milk becomes extremely valuable.

Expressed breast milk refers to milk removed from the breast manually or by using a breast pump and then stored for later feeding. It allows the baby to continue receiving the benefits of breast milk even when direct breastfeeding is not possible. It also helps in maintaining milk

production, preventing breast engorgement, supporting lactation and reducing the risk of early discontinuation of breastfeeding.

Although expressed breast milk is highly beneficial, improper collection and storage can lead to contamination and spoilage. Mothers must know the correct method of hand washing, cleaning of containers, breast milk expression, labeling, storage temperature, duration of storage, thawing and warming. They should also know that breast milk should not be boiled or heated directly on flame, and microwaving should be avoided because it can destroy nutrients and cause uneven heating. Safe handling is essential to preserve the quality and safety of breast milk.

Primi antenatal mothers require special attention because they are entering motherhood for the first time. They may have doubts, myths and fears related to breastfeeding and milk expression. Many mothers may not know when expressed breast milk is needed, how to collect it, how long it can be stored, and how it should be given to the baby. Antenatal period is the best time to educate mothers because they are psychologically prepared to learn about childbirth, newborn care and infant feeding. A self-instructional module is a useful educational tool because it provides structured information in simple language and can be read repeatedly by mothers at their own convenience.

Community health nurses and maternity nurses play a crucial role in educating antenatal mothers. Through planned health teaching, demonstration, counselling and written educational material, nurses can improve maternal knowledge and promote safe breastfeeding practices. The present study was therefore undertaken to assess the effectiveness of a self-instructional module on collection and storage of expressed breast milk among primi antenatal mothers in Tirupati.

Need and Significance of the Study

Breastfeeding practices have a direct impact on infant health. Inadequate breastfeeding and improper feeding practices contribute to malnutrition, infections and increased infant morbidity. In the early months of life, breast milk is the safest and most suitable food for the baby. However, certain circumstances may interrupt direct breastfeeding. Mothers may face problems such as cracked nipples, breast engorgement, inverted nipples, cesarean section discomfort, maternal employment, neonatal hospitalization, premature birth or poor sucking reflex of the

baby. In these conditions, expressed breast milk can help prevent unnecessary use of formula feeding.

Despite the importance of expressed breast milk, many first-time mothers are unaware of its correct collection and storage. Some mothers may express milk without washing hands properly. Some may use unclean containers, keep milk at room temperature for a long duration, mix fresh warm milk with already cooled milk, or reheat milk repeatedly. These incorrect practices may increase the risk of bacterial growth and affect the safety of the milk. Lack of knowledge may also cause mothers to discard breast milk unnecessarily or shift to formula feeding when expression could have helped continue breastfeeding.

Education during antenatal visits is one of the most effective ways to prepare mothers for breastfeeding. Primi antenatal mothers often show high interest in learning about newborn care. If they receive correct information before delivery, they may be more confident in managing breastfeeding challenges after childbirth. A self-instructional module can be especially useful in busy hospital settings because it provides standardized information and does not require continuous presence of a health educator. Mothers can read the module at home, discuss doubts during follow-up visits and share information with family members.

The collection and storage of expressed breast milk is not only a clinical issue but also a community health concern. In the Indian context, many mothers return to household or work responsibilities soon after delivery. Some babies may be cared for by grandparents or other family members. When expressed breast milk is collected and stored safely, the baby can continue to receive mother's milk even in the mother's temporary absence. This supports exclusive breastfeeding and reduces dependency on animal milk or commercial substitutes.

From the nursing perspective, health education on expressed breast milk has strong preventive value. Nurses in antenatal clinics, maternity wards, postnatal wards, immunization clinics and community settings can provide education to mothers and families. They can teach mothers how to express milk by hand, how to identify clean containers, how to store milk safely, and how caregivers should feed expressed breast milk. Such education can reduce anxiety and improve maternal confidence.

The present study is significant because it focuses on primi antenatal mothers, who are a vulnerable and educable group. It also evaluates a self-instructional module, which is a simple, cost-effective and reproducible educational intervention. The findings can help nurse educators and community health nurses to include expressed breast milk education as a routine component of antenatal care.

Objectives, Hypothesis and Methodology

Statement of the Problem

A study to assess the effectiveness of self-instructional module on collection and storage of expressed breast milk among primi antenatal mothers at Government Maternity Hospital, Tirupati.

Objectives of the Study

1. To assess the pre-test knowledge regarding collection and storage of expressed breast milk among primi antenatal mothers.
2. To administer a self-instructional module regarding collection and storage of expressed breast milk among primi antenatal mothers.
3. To assess the post-test knowledge regarding collection and storage of expressed breast milk among primi antenatal mothers.
4. To compare the pre-test and post-test knowledge scores regarding collection and storage of expressed breast milk.
5. To determine the effectiveness of the self-instructional module among primi antenatal mothers.

Research Hypothesis

H1: There will be a significant difference between pre-test and post-test knowledge scores regarding collection and storage of expressed breast milk among primi antenatal mothers after administration of the self-instructional module.

Operational Definitions

Effectiveness: In this study, effectiveness refers to the improvement in knowledge score of primi antenatal mothers after administration of the self-instructional module.

Self-instructional Module: It refers to a structured written educational material prepared for primi antenatal mothers regarding collection and storage of expressed breast milk.

Expressed Breast Milk: It refers to breast milk removed from the breast manually or by breast pump and stored for feeding the baby later.

Primi Antenatal Mother: It refers to a pregnant woman who is expecting her first baby and is attending antenatal care services.

Research Approach and Design

A quantitative research approach was used for the study. A pre-experimental one-group pre-test post-test design was adopted to evaluate the effectiveness of the self-instructional module.

Setting of the Study

The study was conducted at Government Maternity Hospital, Tirupati. This setting was selected because it provides antenatal care services to a large number of pregnant women, including primi antenatal mothers.

Population and Sample

The population consisted of primi antenatal mothers attending antenatal outpatient services. The sample included 100 primi antenatal mothers who fulfilled the inclusion criteria.

Sampling Technique

Purposive sampling technique was used to select the study participants.

Inclusion Criteria

Primi antenatal mothers who were attending antenatal services, willing to participate in the study and available during the period of data collection were included.

Exclusion Criteria

Mothers who were not willing to participate, mothers who were seriously ill, and mothers who had already received formal training regarding expressed breast milk were excluded.

Tool for Data Collection

A semi-structured interview schedule was used to collect data. The tool consisted of two sections. Section I included demographic variables. Section II included knowledge questions related to collection and storage of expressed breast milk.

The knowledge questionnaire covered the following areas: meaning and importance of expressed breast milk, indications for expression, hand hygiene, breast and container hygiene, methods of expression, storage containers, storage temperature and duration, labeling, thawing, warming, feeding and precautions.

Description of the Intervention

The self-instructional module was prepared in simple language and included practical information about expressed breast milk. It explained the importance of breast milk, situations requiring expression, steps of manual expression, hygiene measures, storage guidelines, thawing methods and safe feeding practices. The module was distributed after the pre-test. Mothers were asked to read the module carefully. The post-test was conducted after five days using the same questionnaire.

Ethical Considerations

Permission was obtained from the concerned authority of the hospital. The purpose of the study was explained to the mothers. Informed consent was obtained from each participant. Confidentiality and anonymity were maintained throughout the study. Participation was voluntary and mothers were allowed to withdraw at any time.

Data Collection Procedure and Results

Data Collection Procedure

The data collection was carried out among 100 primi antenatal mothers attending Government Maternity Hospital, Tirupati. The investigator first introduced herself and established rapport with the participants. The purpose of the study was explained and informed consent was obtained. The pre-test was conducted using the semi-structured interview schedule to assess baseline knowledge regarding collection and storage of expressed breast milk.

After completion of the pre-test, the self-instructional module was distributed to the participants. The investigator explained the importance of reading the module and clarified basic doubts. The mothers were given five days to read and understand the content. On the fifth day, the post-test was conducted using the same questionnaire. The collected data were organized, tabulated and analyzed using descriptive and inferential statistics.

Plan for Data Analysis

Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe the data. Inferential statistics, especially paired 't' test, was used to compare pre-test and post-test knowledge scores and to assess the effectiveness of the self-instructional module.

Findings Related to Knowledge Scores

The study findings revealed a marked improvement in knowledge scores after administration of the self-instructional module. The pre-test mean knowledge score was 5.69 with a standard deviation of 2.23. This showed that many mothers had inadequate knowledge regarding expressed breast milk before the intervention.

After administration of the self-instructional module, the post-test mean knowledge score increased to 16.13 with a standard deviation of 0.95. The mean difference between pre-test and post-test scores was 10.44. This increase indicates that mothers gained knowledge regarding the correct method of collection and storage of expressed breast milk.

The calculated paired 't' value was 45.094. This value was found to be statistically significant at 0.05 level. Therefore, the research hypothesis was accepted. The result clearly shows that the self-instructional module was effective in improving knowledge among primi antenatal mothers.

Interpretation of Findings

The major finding of the study was that structured written information significantly improved knowledge regarding collection and storage of expressed breast milk. The low pre-test score may be due to lack of previous exposure, inadequate antenatal counselling, myths related to breast milk expression, or limited knowledge about safe storage practices. Primi mothers may not have practical experience in breastfeeding or expressed milk handling; therefore, their baseline knowledge was expected to be low.

The high post-test score indicates that the self-instructional module was understandable, relevant and useful for the participants. The module helped mothers learn about hand hygiene, clean collection, safe containers, storage duration, labeling, thawing and feeding. The reduction in standard deviation from pre-test to post-test also suggests that knowledge became more uniform among the participants after the intervention.

The result supports the value of self-learning material in antenatal education. In busy maternity hospitals, nurses may not always have enough time to provide repeated individual teaching to every mother. A self-instructional module can bridge this gap by providing standardized content that mothers can read at their own pace. When combined with nurse counselling, such modules may further improve knowledge and practice.

Discussion and Nursing Implications

Discussion

The present study assessed the effectiveness of a self-instructional module on collection and storage of expressed breast milk among primi antenatal mothers. The findings showed significant improvement in knowledge after the intervention. The pre-test mean score was 5.69 ± 2.23 , while the post-test mean score increased to 16.13 ± 0.95 . The mean difference was 10.44 and the paired 't' value was 45.094, which was significant at 0.05 level.

This improvement indicates that primi antenatal mothers can learn effectively when information is provided in a simple, structured and self-explanatory manner. Since these mothers are preparing for motherhood for the first time, antenatal education has a strong influence on their future infant feeding practices. The self-instructional module likely helped mothers understand not only the procedure but also the reason behind safe collection and storage practices.

Expressed breast milk is important in several situations. For example, it can be used when the baby is premature, sick, sleepy, unable to latch, or separated from the mother. It is also useful when the mother has to return to work, attend personal duties, or manage temporary breast problems. However, the benefits of expressed breast milk can be maintained only when correct hygiene and storage practices are followed.

The study findings highlight the importance of antenatal counselling. Many mothers receive information on breastfeeding only after delivery, when they may be physically tired, anxious or busy caring for the baby. Providing information during pregnancy allows mothers to prepare in advance. It also gives them time to discuss doubts with nurses and family members.

Implications for Nursing Practice

Nurses working in antenatal clinics should include education on expressed breast milk as part of routine counselling. They can teach mothers about hand washing, breast hygiene, manual expression, use of clean containers, labeling, refrigeration, thawing and feeding. Nurses should also correct common misconceptions, such as the belief that expressed milk is inferior to direct breastfeeding or that milk must always be boiled before feeding.

Implications for Nursing Education

Nursing students should be trained to provide practical demonstrations on breast milk expression and storage. Community health nursing curriculum should emphasize breastfeeding counselling, lactation support and maternal education. Students should learn to prepare and use self-instructional modules, pamphlets, charts and demonstrations for maternal and child health education.

Implications for Nursing Administration

Nursing administrators can ensure that antenatal clinics have educational materials on expressed breast milk. Posters, booklets and self-instructional modules can be made available in waiting areas. Training sessions can be organized for staff nurses so that they provide uniform and evidence-based information to mothers. Hospital policies may include breastfeeding education as a mandatory component of antenatal care.

Implications for Nursing Research

Further research can be conducted using a true experimental design with a control group. Studies can also assess actual practices of mothers after delivery, retention of knowledge after one month, and effectiveness of video-assisted teaching or demonstration-based teaching. Similar studies can be conducted among postnatal mothers, working mothers, mothers of preterm babies and caregivers.

Limitations of the Study

The study was limited to 100 primi antenatal mothers from one government maternity hospital in Tirupati. Purposive sampling was used, so generalization may be limited. The design did not include a control group. The post-test was conducted after five days, so long-term retention of knowledge was not assessed. The study assessed knowledge but did not directly observe actual practice of breast milk expression and storage.

Recommendations

A similar study may be conducted with a larger sample size. A comparative study may be conducted between self-instructional module and demonstration method. A follow-up study may be conducted after delivery to assess actual practice. Educational programmes on expressed breast milk should be included in routine antenatal classes. Community health nurses may conduct awareness sessions for mothers and family caregivers.

Conclusion and References

Conclusion

Breast milk is the best and safest nutrition for infants. Expressed breast milk is an important method of ensuring that the baby continues to receive mother's milk even when direct breastfeeding is not possible. However, the safety and quality of expressed breast milk depend on correct knowledge and practice related to collection, storage, thawing and feeding.

The present study evaluated the effectiveness of a self-instructional module on collection and storage of expressed breast milk among primi antenatal mothers at Government Maternity Hospital, Tirupati. The study findings showed a significant improvement in knowledge after the intervention. The pre-test mean score was 5.69 ± 2.23 , while the post-test mean score increased to 16.13 ± 0.95 . The mean difference was 10.44 and the calculated paired 't' value was 45.094, which was statistically significant at 0.05 level.

Thus, the self-instructional module was found to be effective in improving knowledge among primi antenatal mothers. The study emphasizes that simple, low-cost educational material can be successfully used in antenatal settings. Community health nurses and maternity nurses should provide regular education regarding expressed breast milk to promote exclusive breastfeeding, prevent unsafe feeding practices and improve infant health outcomes.

Education of primi antenatal mothers is an investment in maternal and child health. When mothers are empowered with correct knowledge, they are more confident in caring for their babies. The self-instructional module can be used as a practical tool in antenatal clinics, maternity hospitals and community health settings to create awareness regarding safe collection and storage of expressed breast milk.

References

1. Centers for Disease Control and Prevention. Breast Milk Storage and Preparation. CDC; 2026.
2. American Academy of Pediatrics. Milk Storage Guidelines. AAP; 2025.
3. Academy of Breastfeeding Medicine. ABM Clinical Protocol #8: Human Milk Storage Information for Home Use for Full-Term Infants. Breastfeeding Medicine.

4. World Health Organization. Infant and Young Child Feeding: Model Chapter for Textbooks for Medical Students and Allied Health Professionals. Geneva: WHO.
5. UNICEF. Breastfeeding: A Mother's Gift for Every Child. UNICEF.
6. Lawrence RA, Lawrence RM. Breastfeeding: A Guide for the Medical Profession. Elsevier.
7. Polit DF, Beck CT. Nursing Research: Generating and Assessing Evidence for Nursing Practice. Wolters Kluwer.
8. Sharma SK. Nursing Research and Statistics. Elsevier India.
9. Dutta DC. Textbook of Obstetrics. New Delhi: Jaypee Brothers Medical Publishers.
10. Park K. Park's Textbook of Preventive and Social Medicine. Jabalpur: Banarsidas Bhanot Publishers.