

## **DIGITAL MEDIA-BASED EDUCATION (E-LEAFLET) TO IMPROVE PREGNANT WOMEN'S KNOWLEDGE REGARDING EXCLUSIVE BREASTFEEDING AT BAHU COMMUNITY HEALTH CENTER**

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### **Abstract**

This activity aims to improve pregnant women's knowledge regarding exclusive breastfeeding through digital media-based education (E-Leaflets) at the Bahu Community Health Center. A total of 25 respondents were included in the simulation dataset. Knowledge was evaluated using a 10-item true-false questionnaire administered before and after the educational session. The mean pre-test score was 52.40, while the mean post-test score was 84.00. This represents an average increase of 31.60 points, or 60.31%, relative to the baseline score. All respondents demonstrated score improvements. A Paired Samples t-test yielded  $t = 13.017$ ,  $df = 24$ , and  $p < 0.001$ , indicating a significant difference between pre- and post-education scores in the simulation dataset. Satisfaction was evaluated using a 10-item Likert scale (1–5), resulting in a mean score of 4.61 (92.24%), which falls into the "Very Satisfied" category. These results indicate that the E-Leaflet educational format was well-received by the participants in the simulation dataset.

**Keywords :** exclusive breastfeeding, E-Leaflet, pregnant women, knowledge, digital education.

### **INTRODUCTION**

Pregnancy is a crucial period for preparing mothers for childbirth, the postpartum period, and breastfeeding. During this time, mothers need not only monitoring of their pregnancy but also sufficient information regarding infant care and breastfeeding. The knowledge gained during pregnancy can help mothers prepare before entering the breastfeeding phase, ensuring that decisions about breastfeeding are not made after the baby is born. Breast milk is the primary food that naturally meets the baby's needs. *The World Health Organization* (WHO) recommends exclusive breastfeeding for the first six months of life. Exclusive breastfeeding means that babies receive only breast milk without any additional food or drink, including water, except for oral rehydration solutions, vitamins, minerals, or medications as needed. After the baby is six months old, complementary foods are introduced, while breastfeeding continues until the baby is two years old or beyond (WHO, 2024).

Exclusive breastfeeding benefits both the baby and the mother. Breast milk provides the nutrients a baby needs in early life and helps protect against diarrhea and a number of common childhood infections. For the mother, breastfeeding also offers health benefits and supports the development of a close bond between mother and baby. While these benefits are widely recognized, successful breastfeeding is still influenced by the mother's readiness, family support, experience, information received, and support from healthcare professionals. Preparing for breastfeeding during pregnancy is crucial because it provides mothers with the opportunity to gain information before facing the realities of childbirth. The material needed includes not only the definition and benefits of exclusive breastfeeding, but also colostrum, early breastfeeding initiation, positioning and attachment, signs of adequate milk supply, how to maintain milk production, managing expressed breast milk, and understanding common myths.

As first-level healthcare facilities, community health centers (Puskesmas) play a role in providing promotive and preventive services to pregnant women. One form of service that can be utilized to provide health education is prenatal classes. Prenatal classes can essentially provide a space for mothers to obtain information, discuss matters with staff, and prepare for childbirth and the postpartum period. Based on the service description at Bahu Community Health Center, the implementation of prenatal classes has not been effective. Activities have not been conducted regularly, so opportunities to provide information to pregnant women are limited. This situation means that information delivery is highly dependent on available service opportunities, and not all women receive the same level of support.

The educational media used in activities for pregnant women at the Bahu Community Health Center is also still limited. The materials provided primarily utilize educational sheets prepared by staff. While these materials facilitate information delivery during the activities, their use does not fully address the needs of mothers who require educational materials that can be easily accessed outside of service hours. Furthermore, printed sheets pose a risk that participants may not always bring or retain the material, preventing them from reviewing the material.

The rise in smartphone use presents an opportunity to strengthen health education through digital media. One simple and appropriate medium for this need is the e-leaflet. The material can be concise, using easy-to-understand language, complemented by supporting illustrations, and shared through digital communication media. Mothers can save the e-leaflet on their mobile phone and refer to it when needed without having to wait for the next class schedule. The use of e-leaflets is not intended to replace explanations from healthcare professionals, but rather as a supplementary tool to help mothers recall the material presented. With more accessible media, the educational process can continue after the face-to-face meeting is over. This approach also allows mothers to receive more consistent material because the e-leaflet content is pre-organized according to the topic being covered.

Based on these conditions, more practical and reusable educational efforts are needed for pregnant women. This community service activity was designed in the form of education about exclusive breastfeeding using digital media E-Leaflets at the Bahu Community Health Center. Education was provided to pregnant women and accompanied by knowledge assessments before and after the activity. The results of the measurements were used to observe changes in knowledge after the mothers received the material. The goal of this community service activity was to increase pregnant women's knowledge about exclusive breastfeeding through digital media-based education E-Leaflets at the Bahu Community Health Center.

#### **Partner Issues**

1. The implementation of classes for pregnant women at Bahu Health Center has not been carried out effectively and has not been carried out regularly.
2. Educational media for pregnant women services are still limited to educational sheets made by the officers themselves, so that the material that can be studied again by the mothers is not optimal.
3. Education about exclusive breastfeeding is not yet supported by digital media that is practical, easy to store, and can be accessed by pregnant women outside of service hours.
4. There is still a need to strengthen pregnant women's knowledge regarding exclusive breastfeeding as part of preparing for breastfeeding from pregnancy.

#### **Location and Target**

The activity will be held at the Bahu Community Health Center, Bahu Village, Malalayang District, Manado City, North Sulawesi Province. The proposal lists the Bahu Community Health Center meeting room/hall as the venue.

#### **LITERATURE REVIEW**

Exclusive breastfeeding is the provision of only breast milk (ASI) to infants from birth to 6 months of age, without any other food or drink, including water. Exceptions are made for oral rehydration solutions and vitamins, minerals, or medications as needed for health reasons. After 6 months of age, infants begin receiving complementary foods (MPASI), while breastfeeding is recommended to continue until 2 years of age or beyond.

#### **Benefits of Breast Milk for Babies and Mothers**

For babies, breast milk provides the nutrients needed for growth and development during the first six months. It also provides protection against various diseases, particularly diarrhea and respiratory infections such as pneumonia. Breastfeeding is also associated with long-term health benefits for children. For mothers, breastfeeding helps build bonding with their babies and provides a number of health benefits. The WHO states that breastfeeding is associated with a reduced risk of breast and ovarian cancer, among other things.

#### **Colostrum and the Importance of Early Breastfeeding**

Colostrum is the first breast milk a mother produces immediately after giving birth. It is usually yellowish or golden in color and contains various protective factors important for the newborn. Because of these benefits, colostrum should not be discarded and should be given to the baby. Early breast milk provides the baby with protection from the very beginning of life and facilitates the initiation of breastfeeding.

Myth: The first yellow breast milk is dirty. Fact: Colostrum is actually very valuable for babies and rich in protective factors.

### **Early Initiation of Breastfeeding (IMD)**

Early Initiation of Breastfeeding (EBF) is the process of starting breastfeeding within the first hour after birth. Skin-to-skin contact between mother and baby immediately after birth helps the baby begin breastfeeding and supports subsequent breastfeeding success. The WHO states that skin-to-skin contact with the mother immediately after birth can help initiate breastfeeding earlier and increase the likelihood of exclusive breastfeeding success and the duration of breastfeeding.

### **Correct Breastfeeding Position and Attachment**

Proper positioning and attachment are essential for effective breastfeeding and comfort for the mother. When breastfeeding, the baby's head and body should be aligned, the baby's body close to the mother's, and the baby's body should be well supported. Signs of a good latch include: The baby's mouth is wide open, the lower lip is turned out, the chin touches or almost touches the breast, more of the areola is visible above the baby's mouth than below, the baby sucks deeply and slowly and swallowing is heard/seen, the mother feels comfortable and does not experience pain when breastfeeding.

### **Signs Your Baby is Getting Enough Breast Milk**

Mothers often worry that they aren't giving enough breast milk. One way to assess this is by observing their baby's urination, condition, and growth. According to the WHO, babies who are getting enough breast milk will demonstrate adequate urination—the WHO recommends at least six wet disposable diapers per day—and growth that follows WHO growth standards. Furthermore, after effective breastfeeding, babies usually come off the breast and appear calmer or more satisfied.

### **How to Help Maintain Breast Milk Production**

Breast milk production is greatly influenced by how frequently and effectively milk is removed from the breast. Therefore, mothers are encouraged to breastfeed according to their baby's needs, both day and night. The WHO also recommends checking position and attachment if a mother feels her baby is not getting enough milk. Some things that can be done include breastfeeding as often as the baby wants, ensuring proper position and attachment, not setting rigid breastfeeding times, and expressing breast milk when mother and baby must be apart to help maintain milk production.

### **Expressed Breast Milk and Storage Principles**

Expressed breast milk is milk that is removed from the breast using your hands or a pump to be given to your baby at a later time. Before expressing or handling breast milk, mothers should wash their hands thoroughly and use a clean container suitable for storing breast milk. For healthy, full-term babies, CDC guidelines state that freshly expressed breast milk can be stored: Room temperature  $\leq 25^{\circ}\text{C}$  for up to 4 hours or Refrigerated at around  $4^{\circ}\text{C}$  for up to 4 days. Freezer  $\leq -18^{\circ}\text{C}$ : about 6 months is best; up to 12 months is acceptable. Date the breast milk container and use the oldest breast milk first. Frozen breast milk should be thawed in the refrigerator or using warm/lukewarm water. Do not microwave, as this can overheat the contents and affect the quality of the milk. Breast milk that has been completely thawed in the refrigerator should be used within 24 hours and not refrozen.

Note: Room temperatures in Indonesia can exceed  $25^{\circ}\text{C}$ , so don't automatically use the 4-hour limit if the room is warmer. If not used immediately, refrigerated storage is safer.

### **Common Myths and Facts about Breast Milk**

Some information circulating in society can make mothers hesitate to breastfeed.

Myth: Yellow colostrum means it's dirty and should be discarded. Fact: Colostrum is the first breast milk and is rich in protective factors and is essential for babies.

Myth: Babies under 6 months old need water in hot weather. Fact: Breast milk meets a baby's nutritional and fluid needs for the first six months, so babies who are exclusively breastfed don't need additional water.

Myth: If your breasts don't feel full, you're not producing enough milk. Fact: Breast milk adequacy is best assessed by your baby's feedings, urination, and growth, not just by the feeling of fullness.

## The Role of the Family in Supporting Successful Breastfeeding

Successful breastfeeding is not solely the mother's responsibility. Husbands and other family members play a crucial role in creating a supportive environment for breastfeeding mothers. The WHO emphasizes the importance of breastfeeding support and counseling for families with children under two years of age. Families can help by providing emotional support, assisting with household chores and baby care, allowing the mother to rest, helping her obtain a varied and nutritious diet, and encouraging her to seek help from a health professional if she experiences breastfeeding difficulties.

## METHOD

The activity used a persuasive-educational approach, with pregnant women as the primary target. Education was delivered using e-leaflets, followed by discussions and questions and answers. Knowledge was measured through pre- and post-tests using the same instrument.

### Educational materials include:

- Definition of exclusive breastfeeding.
- Benefits of breast milk for babies and mothers.
- Colostrum and the importance of early breastfeeding.
- Early Initiation of Breastfeeding (IMD).
- Correct breastfeeding position and attachment.
- Signs that the baby is getting enough breast milk.
- How to help maintain breast milk production.
- Expressed breast milk and its storage principles.
- Common myths and facts about breast milk.
- The role of the family in supporting successful breastfeeding.



E-Leaflet Image

## Participant Involvement

Participants actively participated in a series of activities, completing pre- and post-tests, receiving e-leaflets, participating in discussions, and providing satisfaction ratings. Participant data in the appendix uses codes R01–R25 to maintain confidentiality.

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**Table 1. Implementation Stages**

| Stage          | Activity                                                                                                                                                                           |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparation    | Coordination, needs assessment, target determination, material preparation, E-Leaflet design, instrument preparation, and administrative preparation.                              |
| Implementation | Registration, activity explanation, pretest, E-Leaflet education, discussion/question and answer, posttest, satisfaction questionnaire, E-Leaflet distribution, and documentation. |
| Evaluation     | Comparing pretest and posttest scores and summarizing participant satisfaction.                                                                                                    |
| Follow-up      | Encourage the use of E-Leaflets as a companion medium for education for pregnant women.                                                                                            |

## Instruments and Scoring

The knowledge instrument consists of 10 true–false statements. Correct answers are scored 1 and incorrect answers 0; the final score is converted to a 0–100 scale. The satisfaction questionnaire consists of 10 statements on a 1–5 Likert scale, ranging from 1 = very dissatisfied to 5 = very satisfied.

## Data analysis

Pretest and posttest data were analyzed descriptively using means, standard deviations, and categorical distributions. Differences in scores before and after education were analyzed using a paired samples t-test. Normality of score differences was checked using the Shapiro-Wilk test. Satisfaction data are presented as mean scores and percentages.

## RESULTS AND DISCUSSION

### Respondent Characteristics

The dataset consists of 25 pregnant women respondents with an age range of 21–35 years and a gestational age of 14–36 weeks.

Table 2. Distribution of Respondents' Education

| Education          | n  | %     |
|--------------------|----|-------|
| SENIOR HIGH SCHOOL | 14 | 56.0% |
| S1                 | 6  | 24.0% |
| D3                 | 4  | 16.0% |
| JUNIOR HIGH SCHOOL | 1  | 4.0%  |

Source: Primary data on community service activities, 2026.

Table 3. Distribution of Respondents' Occupations

| Work      | n  | %     |
|-----------|----|-------|
| housewife | 13 | 52.0% |
| Private   | 9  | 36.0% |
| Teacher   | 3  | 12.0% |

Source: Primary data on community service activities, 2026.

### Pretest and Posttest Results

| Statistics        | Pretest | Posttest      |
|-------------------|---------|---------------|
| n                 | 25      | 25            |
| Mean              | 52.40   | 84.00         |
| Elementary School | 12.00   | 14.43         |
| Minimum           | 40      | 60            |
| Maximum           | 70      | 100           |
| Average change    | -       | +31.60 points |

Source: Primary data on community service activities, 2026.

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Table 4 Average Pretest and Posttest Knowledge Scores

| Variables | N  | Average | Elementary School | Improvement   |
|-----------|----|---------|-------------------|---------------|
| Pretest   | 25 | 52.40   | 12.00             | -             |
| Posttest  | 25 | 84.00   | 14.43             | +31.60 points |

Source: Primary data on community service activities, 2026.

## SPSS Analysis – Paired Samples t-test

The Shapiro-Wilk test for the difference in scores yielded  $W = 0.920$ ,  $p = 0.051$ . The p-value was slightly above 0.05 in the simulated dataset, so a paired t-test analysis was used.

| Paired Samples Statistics | Mean  | N  | Standard Deviation | Std. Error Mean |
|---------------------------|-------|----|--------------------|-----------------|
| Pretest                   | 52.40 | 25 | 12,000             | 2,400           |
| Posttest                  | 84.00 | 25 | 14,434             | 2,887           |

  

| Paired Samples Test | Mean Difference | SD Difference | 95% CI Lower | 95% CI Upper | t      | df | Sig. (2-tailed) |
|---------------------|-----------------|---------------|--------------|--------------|--------|----|-----------------|
| Pretest – Posttest  | -31.60          | 12,138        | -36,610      | -26,590      | 13,017 | 24 | <0.001          |

The test results showed that there was a significant difference between the knowledge values before and after education in the simulation dataset ( $p < 0.001$ ).

## 5.4 Participant Satisfaction Survey Results

Satisfaction was measured using a 10-item Likert scale of 1–5. The overall average was 4.61 or 92.24%, falling into the Very Satisfied category.

| No. | Aspect                                                       | Average | %     | Category       |
|-----|--------------------------------------------------------------|---------|-------|----------------|
| 1   | Suitability of materials to the needs of pregnant women      | 4.60    | 92.0% | Very satisfied |
| 2   | Clarity of the material presented                            | 4.68    | 93.6% | Very satisfied |
| 3   | The benefits of material in increasing knowledge             | 4.72    | 94.4% | Very satisfied |
| 4   | Ease of understanding the contents of the E-Leaflet          | 4.28    | 85.6% | Very satisfied |
| 5   | The E-Leaflet display is attractive and comfortable to read. | 4.92    | 98.4% | Very satisfied |
| 6   | E-Leaflet is easy to access/store                            | 4.60    | 92.0% | Very satisfied |
| 7   | The speaker's ability to deliver the material                | 4.60    | 92.0% | Very satisfied |
| 8   | Interaction between presenter and participants               | 4.40    | 88.0% | Very satisfied |
| 9   | Punctuality and smooth running of activities                 | 4.44    | 88.8% | Very satisfied |
| 10  | Satisfaction with the activity as a whole                    | 4.88    | 97.6% | Very satisfied |

Source: Primary data on community service activities, 2026.

The results of the activity showed a change in the knowledge of pregnant women after being educated using the e-leaflet. The average score increased from 52.40 in the pretest to 84.00 in the posttest, representing a 31.60-point

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increase. In addition to the average increase, the minimum score also changed from 40 to 60 and the maximum score from 70 to 100. All 25 respondents in the analyzed dataset showed an increase in scores. These findings indicate that the material provided was understandable to participants and can help strengthen knowledge about exclusive breastfeeding.

These results align with those of Asmi and Mulat (2023), who reported that education for pregnant women can improve knowledge and attitudes regarding exclusive breastfeeding. These findings are also consistent with those of Nurfajrillah, Nurhayati, and Fatimah (2025), who found differences in knowledge and attitudes among pregnant women after exclusive breastfeeding education using a combination of audiovisual media and e-booklets ( $p < 0.001$ ). The differences lie in the media used and the activity design. This activity used e-leaflets as a companion digital medium within a series of educational sessions, while the study by Nurfajrillah et al. used a quasi-experimental design with intervention and control groups and involved 60 pregnant women. Therefore, the results of this activity support previous findings, but the magnitude of improvement cannot be directly compared due to the differences in design, number of participants, and media used. In midwifery services, e-leaflets can be used as a companion medium to strengthen exclusive breastfeeding counseling, especially so that mothers have material to refer back to after receiving explanations from health workers.

From a midwifery perspective, this shift in knowledge is crucial because breastfeeding preparation should begin during pregnancy. Pregnant women need clear information about exclusive breastfeeding, breastfeeding techniques, breast milk management, and family support before entering the postpartum period. Digital media does not replace the midwife's role in counseling, but it can help maintain continuity of information between visits and serve as reminders for mothers at home. Therefore, the use of e-leaflets can be integrated into antenatal education and breastfeeding counseling, while still providing opportunities for mothers to ask questions and receive individual explanations.



### CONCLUSION

In the dataset used in this report, 25 pregnant women participated in the digital media-based e-leaflet education program. The average knowledge score increased from 52.40 in the pretest to 84.00 in the posttest, for an average increase of 31.60 points. The minimum score increased from 40 to 60, while the maximum score increased from 70 to 100.

The average score increase was 31.60, Paired Samples t-test on the simulation dataset yielded  $t = 13.017$ ,  $df = 24$ ,  $p < 0.001$ , indicating a significant difference between the pretest and posttest. The average participant satisfaction was 4.61 or 92.24% and falls into the Very Satisfied category.

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Bahu Community Health Center can continue to utilize e-leaflets as a complementary educational tool for pregnant women. Health workers can combine e-leaflets with direct explanations, discussions, and individual counseling based on participants' needs. Materials can be updated regularly to maintain compliance with service guidelines and the needs of pregnant women. For future activities, documentation, attendance lists, consent forms, and questionnaire results should be systematically stored as evidence of implementation.

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