



RESEARCH ARTICLE

Exclusive Breastfeeding Education on Pregnant Women's Knowledge at Primary Health Center

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Abstract

Background: Exclusive breastfeeding during the first six months of life is recognized as the optimal infant feeding practice and is strongly recommended by the World Health Organization. However, exclusive breastfeeding coverage remains below national and global targets, including in Indonesia, partly due to limited maternal knowledge, misconceptions, and insufficient education during pregnancy at the primary health care level.

Objective: This study aimed to assess the effect of exclusive breastfeeding education on improving pregnant women's knowledge at Puskesmas Lubuk Begalung, Padang, Indonesia.

Method: A pre-experimental one-group pretest–posttest design was conducted among pregnant women attending antenatal care. Participants were recruited using convenience sampling. The intervention consisted of structured education and workshop sessions on exclusive breastfeeding. Knowledge was measured before and after the intervention using a validated questionnaire and analyzed using descriptive statistics and the Wilcoxon signed-rank test.

Result: Thirty-two respondents completed the study. The mean knowledge score increased from 58.45 before the intervention to 91.03 after the intervention. Statistical analysis showed a significant improvement in knowledge following the education and workshop intervention ($p < 0.05$).

Conclusion: Exclusive breastfeeding education significantly improved pregnant women's knowledge. Integrating structured education and interactive workshops into routine antenatal care is recommended in primary health care settings locally.

Keywords: Exclusive breastfeeding, health education, pregnant women, primary health care, maternal knowledge

INTRODUCTION

Exclusive breastfeeding (EBF) during the first six months of life is widely recognized as the gold standard for infant nutrition. Breast milk provides an optimal balance of macronutrients and micronutrients tailored to the physiological needs of infants, along with a wide range of bioactive components such as immunoglobulins, enzymes, hormones, and growth factors. These components play a crucial role in supporting infant growth, immune system maturation, and neurocognitive development during the most critical period of early life. In addition to its nutritional adequacy, breast milk enhances gastrointestinal maturation, protects against infectious diseases, and contributes to long-term metabolic and neurological health outcomes.^{1,2} The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside appropriate complementary feeding up to two years of age or beyond. This recommendation is supported by extensive scientific evidence demonstrating that exclusive breastfeeding reduces infant morbidity and mortality, particularly from diarrheal diseases and acute respiratory infections, while also providing protective effects against chronic conditions later in life. Furthermore, exclusive breastfeeding offers significant benefits for mothers, including reduced risk of postpartum hemorrhage, breast and ovarian cancer, and improved birth spacing.^{1,2}

Despite these well-established benefits and global recommendations, exclusive breastfeeding coverage remains suboptimal worldwide. The most recent Global Breastfeeding Scorecard reported that approximately 48% of infants globally are exclusively breastfed for the first six months of life, which remains below the World Health Assembly target of at least 50% by 2025. Although some progress has been made in recent years, the pace of improvement has been slow and uneven across regions, indicating persistent challenges in translating global recommendations into consistent practice at the community level.³ Various intervention models, including education and peer support, have been shown to increase exclusive breastfeeding rates in different populations.^{4,5}

In Indonesia, exclusive breastfeeding coverage also remains below national and international targets and shows considerable variation across provinces and districts.⁶ Analyses based on national nutrition and health survey data indicate that exclusive breastfeeding coverage ranged between approximately 45% and 52% during 2021–2022. This variability reflects disparities in access to health services, maternal education, socioeconomic conditions, and the effectiveness of breastfeeding promotion programs.^{7,8} In the long term, the absence of exclusive breastfeeding may increase the risk of impaired growth, suboptimal cognitive development, and higher susceptibility to infectious and non-communicable diseases in children. At the population level, suboptimal breastfeeding practices are also associated with increased health care costs, productivity losses, and a substantial economic burden for health systems and national economies.^{1,9}

The persistence of suboptimal breastfeeding practices highlights the need for context-specific interventions that address local barriers and determinants. Local situational data further illustrate the magnitude of this challenge. According to the primary health care report, exclusive

breastfeeding coverage at Puskesmas Lubuk Begalung was only 38.89%, substantially lower than the Minimum Service Standard (SPM) target of 80%. This significant gap underscores that low exclusive breastfeeding coverage is not merely a national-level issue but also an operational challenge within primary health care settings.^{7,8} Such findings emphasize the importance of strengthening interventions at the puskesmas level, where maternal and child health services are delivered most directly to the community.¹⁰

Multiple interrelated factors contribute to low exclusive breastfeeding coverage. Maternal knowledge plays a critical role, particularly during pregnancy, when attitudes and intentions toward infant feeding are formed.¹¹ Pregnant women with limited understanding of exclusive breastfeeding benefits, breastfeeding techniques, and lactation management are less likely to practice exclusive breastfeeding after delivery. In addition, persistent cultural beliefs and misconceptions, such as the perception that breast milk alone is insufficient or that infant crying necessitates early complementary feeding, continue to undermine optimal breastfeeding practices.^{9,12} These misconceptions are often reinforced by family members and the broader social environment. Interventions targeting breastfeeding self-efficacy have been shown to positively influence exclusive breastfeeding outcomes.¹³

Health system factors also influence exclusive breastfeeding outcomes which in turn can reduce failures in exclusive breastfeeding practices.¹⁴ Inadequate antenatal and postnatal counseling, limited availability of trained lactation counselors, time constraints during clinical visits, and insufficient educational materials reduce the effectiveness of breastfeeding promotion efforts in primary health care facilities. While breastfeeding counseling is included in maternal health services, its implementation is often inconsistent and lacks standardized, interactive approaches that address mothers' specific concerns and contextual challenges.^{3,9}

Evidence from randomized controlled trials and systematic reviews suggests that structured breastfeeding education and practical workshops can significantly improve maternal knowledge, self-efficacy, attitudes, and, in some cases, exclusive breastfeeding rates. Educational interventions that combine theoretical information with practical demonstrations, peer support, and opportunities for discussion are particularly effective in enhancing mothers' confidence and readiness to breastfeed.¹⁵ However, the effectiveness of such interventions varies depending on their intensity, delivery methods, timing, and cultural adaptation. Importantly, many existing studies have been conducted in controlled or hospital-based settings, limiting their applicability to routine primary health care services.^{3,12} This is supported by evidence showing that structured and supportive educational interventions significantly improve breastfeeding outcomes.^{16,17}

Given these conditions, focused interventions that integrate antenatal education, hands-on workshops on lactation management, and capacity strengthening of primary health care providers are increasingly recognized as essential strategies to improve exclusive breastfeeding practices. Pregnancy represents a critical window of opportunity for intervention, as knowledge and attitudes formed during this period strongly influence postpartum behaviors.^{3,12,18} Strengthening breastfeeding education during antenatal care may therefore contribute to improved breastfeeding

outcomes at the population level.

Despite the growing body of evidence supporting breastfeeding education, there remains a paucity of robust data evaluating the effectiveness of tailored educational packages implemented within Indonesian puskesmas. Context-specific evidence is needed to inform policy and practice, particularly in areas with low exclusive breastfeeding coverage.^{7,12} Therefore, this study aims to assess the effect of exclusive breastfeeding education on improving pregnant women's knowledge at Puskesmas Lubuk Begalung. The findings are expected to provide empirical support for strengthening breastfeeding education interventions within primary health care settings as part of broader efforts to improve maternal and child health outcomes.

METHODS

This study employed a pre-experimental design using a one-group pretest–posttest method to evaluate the effect of an exclusive breastfeeding education intervention on pregnant women's knowledge. This design was selected to assess changes in knowledge levels before and after the intervention within the same group of participants, without the use of a comparison or control group. The study population consisted of pregnant women residing in the working area of Puskesmas Lubuk Begalung, Padang, Indonesia. A convenience sampling technique was applied, whereby participants were recruited based on their availability and willingness to participate during routine antenatal care visits. Pregnant women who met the inclusion criteria and provided informed consent were enrolled in the study. A total of 34 respondents were initially recruited; however, only participants who completed both the pretest and posttest assessments were included in the final analysis. Respondents' knowledge levels regarding exclusive breastfeeding were measured prior to the educational intervention (pretest) and reassessed following the intervention (posttest).

Data collection was conducted using an exclusive breastfeeding knowledge questionnaire developed by Sekardewi (2019). The questionnaire had previously undergone reliability testing at Puskesmas IV South Denpasar involving 20 respondents. The reliability analysis yielded a Cronbach's alpha coefficient of 0.609, which exceeded the r-table value of

0.378 for $n = 18$, indicating acceptable internal consistency and reliability for research use. The instrument consisted of 20 dichotomous (yes/no) items covering five main domains: definition of exclusive breastfeeding, types of breast milk, breast milk composition, factors affecting breast milk production, and the benefits of exclusive breastfeeding. A Guttman scale was applied for scoring the questionnaire responses. Each correct response was assigned a score of 1, while incorrect responses were scored as 0. The total knowledge score for each respondent was calculated by summing all item scores and converting them into a percentage of the maximum possible score. Knowledge levels were then categorized into three groups: good (76–100%), moderate (56–75%), and poor (<56%). This categorization was used to facilitate interpretation of knowledge levels before and after the intervention.

The educational intervention consisted of structured education and workshop sessions on exclusive breastfeeding, which included lectures, discussions, and interactive components designed to enhance participants' understanding of key concepts related to breastfeeding. The intervention was delivered by trained health personnel at the primary health care facility. Statistical analysis was performed using SPSS for Windows version 27. Descriptive statistics were used to summarize respondents' demographic characteristics and knowledge scores. Data normality was assessed using the Shapiro–Wilk test, which indicated that the data were not normally distributed. Consequently, differences in knowledge scores before and after the educational intervention were analyzed using the Wilcoxon signed-rank test, which is appropriate for paired, non-normally distributed data. A p-value < 0.05 was considered statistically significant for all analyses.

RESULT AND DISCUSSION

Based on Table 1, A total of 32 pregnant women who met the inclusion criteria and completed all stages of the study were included in the analysis. Based on the age classification of the Indonesian Ministry of Health, most respondents were in the early adulthood group (26–35 years), accounting for 20 participants (62.5%). In terms of educational level, the majority of respondents had completed senior high school, with 18 participants (56.2%). Regarding employment status, most respondents were housewives, totaling 30 participants (93.8%). With respect to parity, more than half of the respondents were multiparous (19 participants; 59.4%), whereas 13 participants (40.6%) were primiparous.

Table 1. Characteristics of Respondents

Characteristic	Variable	n	%
Age	Early adulthood (26–35 years)	20	62.5
	Late adulthood (36–45 years)	12	37.5
Educational level	Junior high school	7	21.9
	Senior high school	18	56.2
	Diploma (D3)	1	3.1
	Higher education	6	18.8
Occupation	Housewife	30	93.8
	Private employee	2	6.2
Parity	Primiparous	13	40.6
	Multiparous	19	59.4

Descriptive statistical analysis (Figure 1) demonstrated a substantial improvement in respondents' knowledge following the educational intervention.

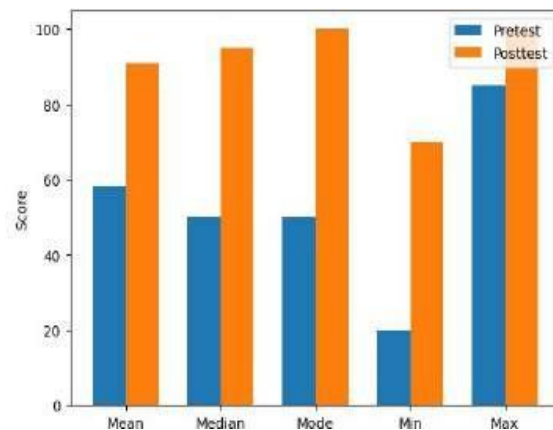


Figure 1. Comparison of Descriptive Statistics Between Pretest and Posttest

The mean knowledge score increased from 58.45 in the pretest to 91.03 in the posttest, while the median score rose from 50 to 95. In addition, the minimum score increased from 20 to 70, and the maximum score reached 100 in the posttest. These findings indicate a marked overall improvement in respondents' knowledge of exclusive breastfeeding after participating in the education and workshop sessions. Wilcoxon signed-rank test confirmed a statistically significant difference between pretest and posttest scores (p value < 0.05). It is demonstrating the effectiveness of the educational intervention in improving pregnant women's knowledge regarding exclusive breastfeeding.

Table 2. Exclusive Breastfeeding Knowledge Scores Before and After the Educational Intervention

Knowledge Variable	Mean $\pm$ SD		P value*
	Pre-test	Post-test	
Exclusive Breastfeeding Knowledge	59.26 $\pm$ 21.32	91.76 $\pm$ 9.04	< 0.001

*Wilcoxon signed-rank test; $p < 0.05$ was considered statistically significant

Despite the overall improvement, several questionnaire items still demonstrated relatively high proportions of incorrect responses in the posttest. The highest proportion of incorrect answers was observed for the statement regarding the use of medications by breastfeeding mothers, with 32.35% of respondents answering incorrectly. This suggests persistent misconceptions related to pharmacological safety during breastfeeding. The educational materials primarily focused on the benefits of exclusive breastfeeding, breastfeeding techniques, and early initiation of breastfeeding, while specific discussions on medication safety during lactation were limited. These findings highlight the need for more targeted education addressing medication use and breastfeeding safety.

Similarly, 23.53% of respondents incorrectly answered the statement regarding the permissibility of providing complementary foods when an infant cries. This reflects a common

misconception that infant crying indicates insufficient breast milk. Cultural beliefs, personal experience, and family influence may contribute to this misunderstanding, suggesting that a single educational session may be insufficient to modify deeply rooted beliefs. Reinforcement through repeated counseling and family involvement may be necessary to address this issue effectively. Other items with notable incorrect responses included misconceptions about the health benefits of combining breast milk with complementary foods before six months (20.59%) and issues related to contraception and breastfeeding (17.65%). These findings indicate that although overall knowledge improved substantially, certain concepts require more focused and repeated educational reinforcement.

The significant improvement in knowledge observed in this study is consistent with findings from previous research demonstrating the effectiveness of educational interventions in improving exclusive breastfeeding knowledge. A study by Wahyuni et al. (2024) reported a significant increase in maternal knowledge following structured breastfeeding education, with all respondents achieving good knowledge levels after the intervention.¹⁹ Similarly, a study conducted in Nigeria reported a substantial increase in the proportion of mothers with good knowledge of exclusive breastfeeding after educational intervention (95.2% posttest vs. 29.8% pretest; $p < 0.001$).²⁰ These findings reinforce the notion that maternal knowledge regarding exclusive breastfeeding is highly responsive to structured educational exposure, regardless of cultural and geographic context.

Several factors may have contributed to the effectiveness of the education and workshop intervention observed in this study. First, the intervention was delivered during pregnancy, a critical period when women are more receptive to health information and more likely to form intentions related to infant feeding practices. Second, the combination of didactic lectures, interactive discussions, and practical workshop elements likely facilitated better comprehension and retention of information compared to passive education alone. Interactive learning allows participants to clarify misconceptions, ask questions, and relate new knowledge to personal experiences, which enhances learning outcomes. Third, the relatively homogeneous characteristics of the respondents, most of whom were housewives with a secondary education level, may have supported consistent engagement and participation throughout the sessions.^{3,15} To ensure sustainability of the educational impact beyond the intervention day, the authors developed a dedicated educational website as a continuous learning medium following the education and workshop sessions. The website was designed to provide accessible, evidence-based information on exclusive breastfeeding, including key messages delivered during the intervention, practical guidance, and frequently asked questions. Digital health education platforms have been shown to support knowledge retention and reinforce learning by allowing mothers to revisit information at their own pace and according to their individual needs.^{21–23} In addition, as a form of reinforcement and continuity of care, the authors facilitated direct communication access between pregnant women and lactation counselors, enabling participants to seek clarification, ask questions, or receive guidance whenever needed.

Continuous access to professional support has been shown to enhance maternal confidence, reduce misinformation, and improve adherence to recommended breastfeeding practices. The

integration of digital learning media with ongoing professional support may therefore strengthen the effectiveness of educational interventions and contribute to sustained improvements in exclusive breastfeeding knowledge and practices.^{21,24,25}

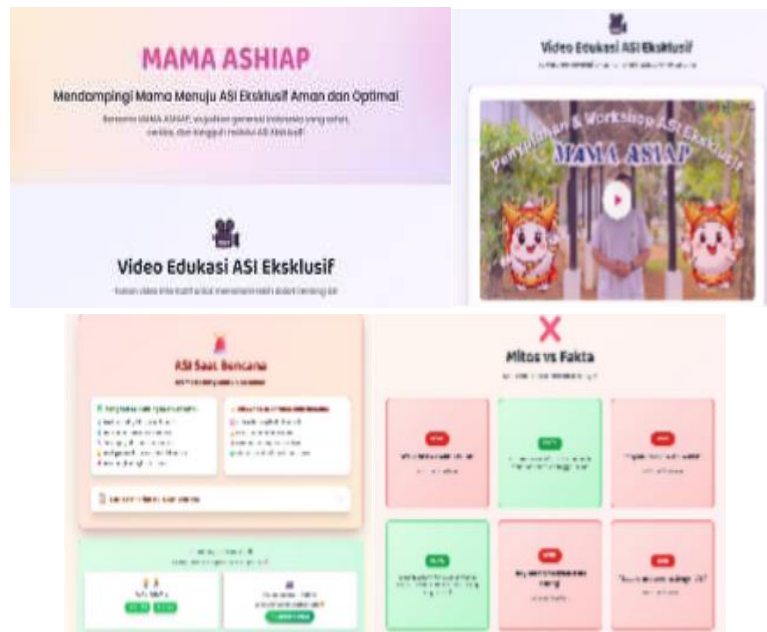


Figure 2. Website as Digital Health Education

This study has several limitations. The use of a pre-experimental design without a control group limits causal inference. Additionally, the convenience sampling technique and relatively small sample size may limit the generalizability of the findings. Furthermore, the study focused only on knowledge outcomes and did not assess behavioral changes or long-term breastfeeding practices. Future studies employing randomized controlled designs with larger samples and longer follow-up periods are recommended.

CONCLUSION

This study demonstrates that exclusive breastfeeding education significantly improved the knowledge of pregnant women at Puskesmas Lubuk Begalung. A statistically significant increase in knowledge scores was observed after the educational intervention, indicating that structured education and workshop-based approaches were effective in enhancing participants' understanding of exclusive breastfeeding. Improvements were evident across descriptive statistical measures, reflecting benefits for respondents with different baseline knowledge levels. Nevertheless, several misconceptions persisted after the intervention, particularly regarding medication use during breastfeeding, early complementary feeding, and contraception, indicating the need for more focused and repeated educational reinforcement. To support the sustainability of learning beyond the intervention day, this study incorporated a dedicated educational website as a continuous

learning medium and facilitated ongoing access to lactation counselors, allowing participants to seek information and guidance when needed. These supportive measures are expected to reinforce knowledge retention and provide continuity of care. However, this study was limited by its pre-experimental design without a control group, convenience sampling, and a focus on knowledge outcomes only. Further studies with stronger designs and longer follow-up are recommended to assess behavioral and long-term breastfeeding outcomes.

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