

ARTICLE INFORMATION

Received: August 07, 2026

Revised: August 24, 2026

Available online: August 26, 2026

at: <https://e-jurnal.iphorr.com/index.php/mchc>

Effect of an e-booklet on knowledge of the lactational amenorrhea method among third-trimester pregnant women

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Abstract

Background: The Lactational Amenorrhea Method (LAM) is a natural contraceptive method that can be used by breastfeeding mothers when specific eligibility criteria are fulfilled. Adequate knowledge during pregnancy is important to support informed postpartum contraceptive decision-making. Digital educational media, such as e-booklets, may facilitate access to reproductive health information.

Purpose: This study aimed to determine the effect of an e-booklet about the Lactational Amenorrhea Method on the knowledge of third-trimester pregnant women.

Method: This study employed a quantitative quasi-experimental design using a one-group pretest-posttest approach. The study involved 30 third-trimester pregnant women selected using total sampling. Knowledge was measured before and after the educational intervention using an LAM knowledge questionnaire. Data were analyzed using the paired-samples t-test after the normality assumption was fulfilled.

Results: The mean knowledge score increased from 3.70 ± 1.368 before the intervention to 8.50 ± 1.503 after the intervention, with a mean increase of 4.80 points. The paired-samples t-test showed a statistically significant difference between pretest and posttest knowledge scores ($p < 0.001$).

Conclusion: The e-booklet intervention significantly improved knowledge about the Lactational Amenorrhea Method among third-trimester pregnant women.

Keywords: E-booklet; Knowledge; Lactational Amenorrhea Method; Pregnant Women.

INTRODUCTION

Pregnancy is the period extending from conception to the birth of the fetus, with a normal duration of 280 days (40 weeks or 9 months and 7 days). It is divided into three trimesters: the first trimester spans from conception to the end of the third month; the second trimester covers the fourth through the sixth month; and the third trimester extends from the seventh through the ninth month (Ministry of Health of the Republic of Indonesia, 2023). The Family Planning (FP) program is a health program designed to help couples of childbearing age plan pregnancy, manage the number of children and birth spacing, and improve the quality of family life through the application of various contraceptive methods. FP plays an important role in reducing health risks for mothers and children, while simultaneously supporting socio-economic

development, especially in developing countries like Indonesia (National Population and Family Planning Board, 2023).

The Lactational Amenorrhea Method (LAM) is an effective natural contraceptive method for breastfeeding mothers, which depends on amenorrhea (absence of menstruation) caused by increased levels of the prolactin hormone during exclusive breastfeeding. LAM can provide a level of contraceptive effectiveness up to 98% if it meets three main criteria: exclusive breastfeeding, no menstruation since childbirth, and the infant being under six months of age (World Health Organization, 2021).

A lack of knowledge about LAM often causes pregnant women to choose hormonal contraceptive methods that may not align with their health conditions,

thereby increasing the risk of side effects and family planning failure. Therefore, effective counseling is needed to provide accurate information to pregnant women, and flipcharts have been proven to be a simple, inexpensive, and easily distributed tool in the context of public health (Lee et al., 2023).

Globally, the rate of exclusive breastfeeding remains low, at around 44%, due to a lack of education, limited support from healthcare workers, and strong myths surrounding breastfeeding. In Southeast Asia, pregnant women's understanding of LAM is also very low, with only about 40% of pregnant women truly understanding the method. As a result, many pregnant women do not use LAM as a safe contraceptive option without side effects. This low level of knowledge and use of LAM has the potential to increase the risk of unplanned pregnancies during the breastfeeding period (UNICEF, 2023).

In Indonesia, modern contraceptive use reached 57.4% in 2022, but LAM as a natural method contributed only about 2–3% of total contraceptive methods used. This figure is lower in rural areas, around 10–15%, compared to urban areas, which reach 20–25%. The low implementation of LAM is caused by a lack of education, such as the view that LAM is ineffective or difficult to apply, as well as a tendency to choose modern methods such as pills or IUDs (National Population and Family Planning Board, 2023).

Based on data from the Bangka Belitung Islands Provincial Health Office, there were 180 postpartum women using the LAM contraceptive method in 2023. The highest usage of LAM contraception was found in Pangkalpinang City with 67 people (3.09%), Bangka Regency with 61 people (2.72%), Belitung Regency with 32 people (1.49%), South Bangka Regency with 15 people (0.56%), and Central Bangka with 5 people (0.26%). West Bangka Regency and East Belitung recorded 0 acceptors of LAM contraception (0%), making them the regions with the lowest usage of LAM in 2023 (Bangka Belitung Islands Provincial Health Office, 2023).

Previous research results show that health counseling delivered through educational media has been proven to increase pregnant women's level of knowledge regarding the Lactational Amenorrhea Method (LAM). A quasi-experimental study conducted in Yogyakarta showed an increase in the average score of pregnant women's knowledge, from 48% before counseling to 78% after counseling, with statistical analysis results of $p\text{-value} = 0.001 (< 0.05)$. In addition, more than 65% of respondents were able to correctly state the requirements for using

LAM after receiving education (Hidayati & Wulandari, 2022).

If counseling on LAM is not provided, pregnant women may lack an understanding of safe contraception, thereby increasing health risks for both mother and child. Without education, only a few mothers know about LAM, which can lead to unplanned pregnancies while breastfeeding and result in issues such as anemia, high blood pressure, or premature birth due to getting pregnant too quickly. A lack of knowledge about LAM causes many mothers to choose excessive modern contraceptives, with risks of side effects such as bleeding or hormonal imbalances. Without counseling, the rate of exclusive breastfeeding remains low, which is harmful to child nutrition and increases the risk of disease.

The Indonesian government strongly supports the Family Planning (FP) program through various national policies, including the Lactational Amenorrhea Method (LAM) as a natural contraceptive option useful for breastfeeding mothers. Law No. 52 of 2009 concerning Population Development and Family Development recognizes FP as a basic human right and an approach to managing population growth, with a focus on FP education to improve family quality of life, as well as the inclusion of LAM in postpartum reproductive health services (Ministry of Law and Human Rights of the Republic of Indonesia, 2009).

The 2020–2024 National Medium-Term Development Plan (NMTDP / RPJMN) tasked the National Population and Family Planning Board (NPFPB / BKKBN) with increasing FP participation to 70% by 2024, with special attention to LAM to reduce reliance on hormonal contraceptives and a usage target of up to 10% through pre-pregnancy education. BKKBN national guidelines on postpartum contraception include LAM based on World Health Organization (WHO) standards, with counseling provided in the third trimester of pregnancy to prevent repeat pregnancies. In Bangka Belitung Islands Province, the Bangka Belitung Health Office implements regional policies to increase the application of LAM in areas with low rates, aligned with the RPJMN and human rights principles, with evaluations conducted through the Indonesian Demographic and Health Survey (IDHS) (National Population and Family Planning Board, 2020).

The National Movement for the Accelerated Improvement of Nutrition (NMAIN / GNPPG) combines LAM with the promotion of exclusive breastfeeding, with an 80% target by 2025, through counseling at integrated health posts (posyandu) and schools as well as media materials like E-booklets for pregnant women in the third

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trimester. The Preconception Education Program at Community Health Centers (Puskesmas) provides counseling on LAM using simple tools, supported by the Bangka Belitung Health Office with reported usage increases from 180 people (2023) to 364 people (2024). The provincial Postpartum FP Program involves annual monitoring and campaigns, with progress in Pangkalpinang City but zero usage in West Bangka and East Belitung (Ministry of Health of the Republic of Indonesia, 2023).

Pregnant women expressed doubts about using LAM due to fear of unplanned pregnancies. This is influenced by a lack of clear information and local environmental experiences claiming natural methods are less effective than other contraceptive options. Some mothers also conveyed that education provided by healthcare workers remains brief and does not yet use engaging media, leading to sub-optimal understanding of the information received. This condition highlights the need for counseling efforts using more effective and easily understood educational media, such as E-booklets, to enhance third-trimester pregnant women's knowledge of the principles, success requirements, and effectiveness of LAM as a postpartum FP method.

RESEARCH METHOD

This study employed a quantitative quasi-experimental design using a one-group pretest-posttest approach. The design was used to evaluate changes in pregnant women's knowledge regarding the Lactational Amenorrhea Method (LAM) before and after receiving health education through an e-booklet. Knowledge was measured before the intervention (pretest) and after the intervention (posttest), and the differences between the two measurements were subsequently analyzed statistically.

The study was conducted at Manggar Public Health Center in 2026. The study population consisted of third-trimester pregnant women receiving antenatal care at the study setting. A total of 30 pregnant women participated in the study. The respondents were selected using a total sampling technique, in which all eligible members of the study population during the study period were included as research participants. The intervention consisted of health education concerning the Lactational Amenorrhea Method using an e-booklet. The educational material presented information about the definition of LAM, its benefits, eligibility requirements, timing of use, and effectiveness as a postpartum contraceptive method.

Before receiving the educational intervention, participants completed a knowledge assessment as a pretest. The e-booklet was then provided as the educational medium. After the intervention, participants completed the same knowledge assessment as a posttest to evaluate changes in their understanding of LAM. The use of an e-booklet was intended to provide information in a structured and accessible format. The digital format also allowed participants to review the educational material independently after. The research instrument was a knowledge questionnaire concerning the Lactational Amenorrhea Method. The questionnaire was administered before and after the intervention to measure changes in participants' knowledge. The knowledge assessment covered information related to the definition of LAM, its requirements, benefits, timing of use, and effectiveness. The pretest and posttest scores were used to determine changes in knowledge following the e-booklet education.

Data collection was conducted in several stages. First, eligible third-trimester pregnant women were identified according to the study population. Participants were then asked to complete the knowledge questionnaire before the intervention. The researchers subsequently provided health education regarding LAM using the prepared e-booklet. After the educational intervention, participants completed the knowledge questionnaire again as a posttest. The pretest and posttest results were then collected, coded, and analyzed to determine whether there was a change in knowledge following the intervention. Descriptive statistics were used to describe the characteristics of the respondents and the distribution of knowledge scores. The results were presented as frequencies, percentages, means, standard deviations, and minimum–maximum values, as appropriate. Before conducting the hypothesis test, the normality of the knowledge data was assessed using the Shapiro-Wilk test. The analysis showed a p-value of 0.064 (>0.05), indicating that the data met the assumption of normality. Because the data were normally distributed and the measurements were obtained from the same participants before and after the intervention, a paired-samples t-test was used to determine whether there was a statistically significant difference between pretest and posttest knowledge scores. Statistical significance was determined at an alpha level of 0.05. A p-value of <0.05 was considered statistically significant.

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RESEARCH RESULTS

Table 1. Characteristics of Respondents (N=30)

Variable	Results
Age (Mean±SD) (Years) (Range)	(28.17±3.71) (18-45)
High Risk <20	1/3.3
High Risk >35	3/10.0
Low Risk/No Risk 20-35	26/86.7
Education Level (n/%)	
Junior High School	6/20.0
Senio High School	17/56.7
Bachelor's Degree	6/20.0
Master's Degree	1/3.3
Occupation (n/%)	
Homemaker	19/63.3
Entrepreneur / Self-Employed	6/20.0
Private Employee / Self-Employed	3/10.0
Honorary Worker / Non-Permanent Employee	2/6.7

Table 1. involved 30 respondents with an average age of 28.17 ± 3.71 years (range: 18–45 years), where the vast majority fell into the low-risk age group of 20–35 years (86.7%), while most completed senior high school education (56.7%) and worked primarily as homemakers (63.3%).

Table 2. Distribution of Knowledge Scores Before and After the Intervention

Variable	(Mean±SD)	Min-Max	Correlation Value (r)	p-value
Before Education	(3.70±1.368)	1-6		0.064
After Education	(8.50±1.503)	6-10	0.796	0.000

Table 2 shows that the average knowledge score of third-trimester pregnant women before receiving education using the E-booklet media was 3.70, with a standard deviation of 1.368, a minimum value of 1, and a maximum value of 6. After receiving education using the E-booklet media, the average knowledge score of third-trimester pregnant women increased to 8.50, with a standard deviation of 1.503, a minimum value of 6, and a maximum value of 10. These results indicate an increase in the average knowledge score of third-trimester pregnant women after receiving education using E-booklet media about the Lactational Amenorrhea Method (LAM). Based on the results of the Shapiro-Wilk normality test, a value of $p = 0.064 > \alpha (0.05)$ was obtained, concluding that the data is normally distributed. Furthermore, statistical analysis was conducted using the

dependent T-test (Paired Sample T-Test). The results of the dependent T-test (Paired Sample T-Test) show a significant difference between the average (mean) knowledge score of third-trimester pregnant women before and after the intervention, changing from an average score of 3.70 before to 8.50 after, representing an increase of 5.20. To examine the strength of the relationship between pregnant women's knowledge before and after receiving E-booklet education on LAM, the Correlation Value (r) = 0.796 falls within the correlation interval of 0.75–1.00, categorized as a very strong (perfect) correlation.

The statistical test results (Paired Sample T-Test) yielded a value of $p = 0.000 < \alpha (0.05)$, concluding that there is a significant difference in the average knowledge of pregnant women regarding the Lactational

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Amenorrhea Method (LAM) before and after receiving counseling via E-booklet media. This means there is a significant effect of providing E-booklet media education on increasing pregnant women's knowledge about LAM.

DISCUSSION

Knowledge is the result of a person's sensory process toward an object through the five senses, especially vision and hearing. Knowledge serves as an important foundation in shaping an individual's health behavior. The better a person's knowledge, the better their ability to determine attitudes and make decisions regarding their health. Pregnant women's knowledge regarding the Lactational Amenorrhea Method (LAM) is crucial because it relates to a mother's readiness to choose a postpartum contraception method that is safe and suitable for breastfeeding mothers (Pakpahan et al., 2021).

Based on the research results, it was found that the mean knowledge score of third-trimester pregnant women before being given counseling using E-booklet media about the Lactational Amenorrhea Method (LAM) was 3.70 with a standard deviation of 1.368, a minimum score of 1, and a maximum score of 6. These results indicate that the knowledge level of third-trimester pregnant women regarding LAM before the intervention was still categorized as low.

The results of this study align with previous research stating that the majority of third-trimester pregnant women still have a low level of knowledge regarding the Lactational Amenorrhea Method (LAM). That study showed that respondents did not yet understand the main requirements for using LAM, the timing of its use, and the effectiveness of LAM as a natural postpartum contraceptive method. The low knowledge among pregnant women is influenced by a lack of education regarding postpartum contraception during prenatal care, as well as the minimal use of educational media that is engaging and easy for respondents to understand (Yuriati & Sulistyowati, 2021).

According to the researcher's assumption, the low level of knowledge among third-trimester pregnant women before receiving counseling occurred because detailed and specific information regarding LAM (Lactational Amenorrhea Method) was rarely provided during antenatal care services. The respondents' low level of knowledge indicated that the majority of third-trimester pregnant women did not yet well understand the definition, benefits, requirements, and effectiveness of LAM as a postpartum contraceptive method. Most respondents also did not know that LAM can be used as

a highly effective natural contraceptive method if three main criteria are met: the mother has not had her period, the infant is under six months old, and the infant receives exclusive breastfeeding.

The low average score also indicated that information regarding LAM was not yet received optimally by the respondents. During pregnancy, the information provided to mothers generally focused more on routine check-ups, labor preparation, pregnancy danger signs, and newborn care, whereas education regarding postpartum contraception specifically LAM was still limited. Furthermore, the educational media previously used had not been able to capture the respondents' attention, leading to low comprehension of LAM.

Based on the research results, it was found that the mean knowledge score of third-trimester pregnant women after being given counseling using E-booklet media about LAM was 8.50 with a standard deviation of 1.503, a minimum score of 6, and a maximum score of 10. These results demonstrate that the knowledge level of third-trimester pregnant women after receiving the intervention experienced a significant increase compared to before receiving the counseling.

Previous research also shows that using visual media is more effective in increasing knowledge compared to standard lecture methods. That study explained that respondents comprehend health information more easily when the delivery is accompanied by engaging supporting media. Visual media helps respondents stay focused during the educational process, making the information provided easier to absorb and retain. Additionally, using educational media helps healthcare workers deliver material more clearly and structurally so that counseling goals can be achieved more optimally (Hidayati & Wulandari, 2022).

Furthermore, another study explained that using digital media in health promotion can increase respondents' understanding and retention of the material presented. That study mentioned that digital media, such as an E-booklet, offers advantages as it can be accessed anytime via smartphone, allowing respondents to re-read the material as needed. This ease of access makes it easier for respondents to understand health information and enhances the effectiveness of health education, particularly for pregnant women preparing their knowledge regarding reproductive health and postpartum contraception (Fatimah et al., 2026).

According to the researcher's assumption, the increase in the mean knowledge score from 3.70 to 8.50 shows that counseling using E-booklet media is effective

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in improving third-trimester pregnant women's understanding of LAM. After receiving the counseling, the majority of respondents understood the definition of LAM, requirements for use, benefits, timing of use, and the effectiveness of LAM as a postpartum contraceptive method.

The increase in respondents' knowledge occurred because the E-booklet media was able to convey information in a more engaging, systematic, and easy-to-understand manner. Presenting material through a combination of text, images, colors, and concise explanations made it easier for respondents to comprehend the material provided. Additionally, the E-booklet media can be saved and re-read on mobile phones, allowing respondents to review the material whenever needed.

Furthermore, an appealing visual presentation kept respondents more focused during the counseling process, making information regarding LAM easier to absorb and remember. Therefore, E-booklet media can serve as an alternative health promotion medium to improve pregnant women's knowledge about the Lactational Amenorrhea Method (LAM).

Health education is a learning process aimed at improving the community's capacity to maintain and enhance their health. The success of health education is influenced by the methods and media used to deliver information. Using educational media that is engaging and tailored to the characteristics of the target audience can help increase respondents' attention, comprehension, and retention of the health information provided (Pakpahan et al., 2021).

E-booklet media is an effective electronic educational medium for health promotion because it delivers information systematically, practically, attractively, and understandably. Moreover, E-booklets can be re-accessed so respondents can review the material provided. The use of visual and electronic media in health education helps enhance the effectiveness of information delivery and increases respondent knowledge.

The research results show that the mean knowledge score before the intervention was 3.70, which increased to 8.50 after receiving counseling via E-booklet media. There was a mean score increase of 4.80 following the intervention. Additionally, statistical test results yielded a value of $p < \alpha$ (0.05), indicating a statistically significant difference between knowledge levels before and after the counseling was provided.

The success of the E-booklet media in improving respondent knowledge is attributed to its ability to present

information more visually, systematically, and clearly than standard verbal counseling. Presenting information through short text, images, colors, and simple explanations helps respondents understand the material more concretely. Additionally, electronic media has the advantage of being accessible at any time according to user needs.

After receiving counseling, the majority of respondents understood the definition, usage requirements, benefits, timing of use, and effectiveness of LAM as a postpartum contraceptive method. The attractive presentation kept respondents focused throughout the session, making information about LAM easier to absorb and remember. Therefore, E-booklet media can serve as an alternative health promotion tool to increase pregnant women's knowledge about the Lactational Amenorrhea Method (LAM).

CONCLUSION

Counseling using E-booklet media proved to be significantly effective in increasing the knowledge of third-trimester pregnant women regarding the Lactational Amenorrhea Method (LAM) ($p = 0.000$; $r = 0.796$).

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