



## Effectiveness of short video education on primigravida's knowledge of colostrum benefits

Anita Sari<sup>1\*</sup>, Istiqamah<sup>1</sup>, Zulliati<sup>2</sup>, Meldawati<sup>1</sup>

<sup>1</sup>Department of Midwifery, Faculty of Health, Sari Mulia University, Banjarmasin, Indonesia

<sup>2</sup>Department of Midwife Profession, Faculty of Health, Sari Mulia University, Banjarmasin, Indonesia

\*Corresponding author: [sariiiiianita25@gmail.com](mailto:sariiiiianita25@gmail.com)

ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p>Received 18 September 2025</p> <p>Accepted 16 January 2026</p> <p>Published 28 February 2026</p> <p><b>Keywords:</b></p> <p>Colostrum benefits</p> <p>Primigravida knowledge</p> <p>Short video education</p> <p>Antenatal care</p> <p>Breastfeeding practices</p>	<p><b>Background:</b> Suboptimal breastfeeding practices, often stemming from inadequate maternal knowledge and cultural misconceptions, contribute significantly to neonatal morbidity and mortality. This is particularly prevalent among primigravida women, who lack prior experience. In areas like Kelayan Timur, Banjarmasin, where early initiation of breastfeeding coverage is critically low (36.4%), innovative educational interventions are urgently needed.</p> <p><b>Objective:</b> This study aimed to evaluate the effectiveness of a short video education intervention in improving knowledge about the benefits of colostrum among primigravida women.</p> <p><b>Method:</b> A pre-experimental one-group pretest-posttest design was employed. A total of 15 primigravida women from Puskesmas Kelayan Timur were recruited via accidental sampling. Participants completed a validated 6-item knowledge questionnaire (Cronbach's alpha = 0.753), watched a 60-second educational video about colostrum benefits, and immediately retaken the questionnaire. Knowledge was categorized as poor (&lt;56%), sufficient (56-75%), or good (76-100%). Data were analyzed using descriptive statistics and the Wilcoxon Signed-Rank Test due to non-normal data distribution.</p> <p><b>Results:</b> The majority of participants were at low-risk age (20-35 years; 80.0%), had mid-low education (86.7%), and were unemployed (80.0%). Pretest results showed most respondents had insufficient knowledge (poor: 46.7%; sufficient: 33.3%; good: 20.0%). Post-test results revealed a significant improvement, with the majority achieving good knowledge (80.0%). The Wilcoxon test confirmed a statistically significant increase in knowledge scores (p-value = 0.004).</p> <p><b>Conclusion:</b> A short video education intervention significantly improved knowledge about colostrum benefits among primigravida women. This accessible and standardized tool shows great potential for integration into routine antenatal care to bridge knowledge gaps, thereby supporting better breastfeeding practices and improved neonatal health outcomes.</p>

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### 1. Introduction

The first 1000 days of life are a golden window of opportunity for child development, with early nutritional interventions having profound long-term impacts. Within this period,



the initiation of breastfeeding, particularly the provision of colostrum, is the most fundamental intervention. Colostrum, the "first vaccine," is rich in immunoglobulins, white blood cells, and essential nutrients, providing newborns with critical passive immunity and protection against infections and neonatal mortality (Finn et al., 2018; Menon, 2023). The World Health Organization (WHO) strongly recommends early initiation of breastfeeding within the first hour of life and exclusive breastfeeding for the first six months (WHO, 2023, 2025). Despite global advocacy, suboptimal breastfeeding practices contribute to approximately 11.6% of under-five mortality annually (WHO, 2014). In Indonesia, while national breastfeeding initiation coverage is relatively high, the rate of exclusive breastfeeding remains a concern, often linked to a lack of maternal knowledge and practices that discard colostrum due to cultural misconceptions about its suitability (Meher & Zaluchu, 2024; Rahmartani et al., 2020; Titaley et al., 2023).

The disparity between national policy and local implementation is evident in regions like Kalimantan Selatan. Preliminary data from the Banjarmasin City Health Office on January 24, 2025, reveals significant sub-regional variations in key health indicators. Specifically, the coverage of early initiation of breastfeeding (*Indonesian*: Inisiasi Menyusui Dini/IMD)—a strong proxy for colostrum administration—is critically low in several Puskesmas (primary health centers). Three Puskesmas reported the lowest IMD rates in 2023: Puskesmas Terminal (54.5%), Puskesmas Pemurus Dalam (46.7%), and Puskesmas Kelayan Timur (36.4%). This indicates that in Kelayan Timur, a stark majority (63.6%) of newborns are deprived of the essential benefits of colostrum, placing them at a higher risk of morbidity and compromising their foundational health.

This problem is particularly acute among primigravida (first-time pregnant women), who lack prior experience and often harbor more anxieties and misconceptions about childbirth and newborn care. Their knowledge base is primarily formed during pregnancy, making antenatal education a critical leverage point (Athinaidou et al., 2024; Natarelli et al., 2024). Traditional counseling methods, while valuable, can be constrained by time limitations of healthcare workers, inconsistent delivery of information, and low patient engagement and recall (Agale & Chivte, 2024). Therefore, there is an urgent need for innovative, scalable, and effective educational interventions that can standardize information, enhance engagement,



and improve knowledge retention among this vulnerable group in low-resource settings like Kelayan Timur.

Short video education emerges as a promising solution. Leveraging high smartphone penetration, even in semi-urban areas, short videos can deliver standardized, visually engaging, prevent viewer fatigue, maximize attention retention, dan easily digestible information in a local language and cultural context. This method has shown efficacy in improving health knowledge and behaviors in various settings (Asyari & Hasnah, 2023; Hansen et al., 2024; Siregar, 2023). This study aims to evaluate the effectiveness of a short video education intervention in improving knowledge about the benefits of colostrum among primigravida mothers at the Puskesmas Kelayan Timur in Banjarmasin. By demonstrating the efficacy of this tool, the research seeks to provide evidence for its integration into standard antenatal care packages to ultimately improve IMD rates and neonatal health outcomes in the region.

## **2. Methods**

### **Research design**

This study employed a pre-experimental design with a one-group pretest-posttest approach. This design was selected to evaluate the immediate effect of an educational intervention using short video media on the knowledge of primigravida pregnant women about the benefits of colostrum. Data were collected from the same group of participants before (pretest) and immediately after (posttest) the short video education. The one-group approach was carried out due to the limited number of respondents available during the research period.

### **Participant**

The study was conducted at the Puskesmas Kelayan Timur in Banjarmasin, Kalimantan Selatan, Indonesia. This location was purposively selected based on preliminary data from the Banjarmasin City Health Office (January 24, 2025), which identified it as having the lowest coverage of Early Breastfeeding Initiation (EBI) in the city (36.4%) in 2023. The target population was all primigravida pregnant women registered at the puskesmas. The sample was selected using accidental sampling during the research period (May 19 to June 9, 2025). The inclusion criteria were: primigravida pregnant women who attended antenatal care at the puskesmas during the data collection period and were willing to participate by signing the



informed consent. Participants with communication barriers or who did not complete both the pretest and posttest were excluded. A total of 15 participants were recruited, representing the majority of the available population of 18 registered primigravida women at the puskesmas. The sample size was determined not only by the high proportion of eligible participants but also by the availability of the target population during the study period. Moreover, based on Slovin's formula with a margin of error of 0.1, the minimum required sample size for this population was 15 (Mukti, 2025). Therefore, the number of participants recruited adequately met the minimum sample size requirement.

### **Data collection**

Data were collected using a self-developed knowledge questionnaire based on a comprehensive literature review. The questionnaire consisted of 10 initial items measured on a Guttman scale (true/false), focusing on the benefits of colostrum. The questionnaire was tested on 15 pregnant women from a different puskesmas (Pekauman). Validity was assessed using Pearson Product Moment correlation. Six items were found to be valid ( $p < 0.05$ ), while four were discarded. The reliability of the final 6-item instrument was confirmed with a Cronbach's alpha coefficient of 0.753, indicating good internal consistency.

The procedure was conducted in a single session for each participant to minimize attrition. It involved three steps:

1. Pretest: Participants completed the paper-based questionnaire.
2. Intervention: Participants watched a 60-second educational short video about the benefits of colostrum. The video, presented in a 16:9 aspect ratio and portrait orientation, was played on a smartphone with a headset to ensure immersion. It was developed by the researcher using copyright-free assets, a text-to-speech generator for narration, and video editing software.
3. Posttest: Immediately after viewing the video, participants completed the same questionnaire again.

### **Data analysis**

Data analysis was performed using SPSS 26.0 software. Descriptive statistics (frequencies and percentages) were used to summarize the participants' characteristics and their knowledge levels before and after the intervention. Knowledge scores were calculated as the percentage of correct answers and categorized as "poor" ( $<56\%$ ), "sufficient" (56-75%),



or "good" (76-100%). The Shapiro-Wilk test was first used to assess the normality of the data distribution. As the data were not normally distributed ( $p < 0.05$ ), the Wilcoxon Signed-Rank Test was employed to compare the paired pretest and posttest knowledge scores. A p-value of less than 0.05 was considered statistically significant.

### Ethical Consideration

This study received formal ethical approval from the Research Ethics Committee of Universitas Sari Mulia (Ethical Clearance No: 145/KEP-UNISM/IV/2025) prior to commencement. Official research permits were subsequently obtained from the Banjarmasin City Health Office and the head of Kelayan Timur Public Health Center. The principle of informed consent was strictly upheld; all participants received a thorough explanation of the study's aims, procedures, potential benefits, and risks, and provided written consent before participation. Anonymity and confidentiality were guaranteed by using codes instead of personal identifiers on all data forms and by securing the collected data. Participation was entirely voluntary, and participants retained the right to withdraw from the study at any point without penalty. To ensure justice and beneficence, the intervention posed no physical or psychological harm, and all participants received a token of appreciation for their time.

### 3. Result

Based on the collected data, the demographic characteristics of the respondents in this study can be described as follows. The majority of respondents were classified in the non-risk age group (20-35 years), had a middle educational background, and were unemployed. The complete distribution of the study sample characteristics is presented in Table 1.

Table 1. Responden characteristics

Characteristic	Frequency (n)	Percentage (%)
<b>Age</b>		
At-risk (<20 years)	3	20,0
Not at-risk (20-35 years)	12	80,0
<b>Education</b>		
Low (No School, elementary, junior high)	6	40,0
Middle (Senior high school)	7	46,7
Tinggi (Tertiary education)	2	13,3
<b>Occupation</b>		
Unemployed	12	80,0
Employed	3	20,0
<b>Total</b>	<b>15</b>	<b>100</b>



Prior to the educational intervention using short video media, the level of knowledge among primigravida pregnant women regarding the benefits of colostrum was first measured. The initial assessment (pre-test) results indicated that nearly half of the total respondents fell into the category of poor knowledge, with another thirty percent remaining in the sufficient category. The complete distribution of respondents' knowledge levels before the intervention can be seen in Table 2 below.

Table 2. Maternal knowledge before intervention

Category	Frequency (n)	Percentage (%)
Poor	7	46,7
Sufficient	5	33,3
Good	3	20,0
Total	15	100

Following the delivery of the educational intervention via short video media, a significant improvement in knowledge was observed among the primigravida pregnant women. The majority of respondents, specifically twelve individuals, now possessed a good level of knowledge regarding the benefits of colostrum. The complete distribution of post-intervention knowledge assessment results is presented in Table 3.

Table 3. Maternal knowledge after intervention

Category	Frequency (n)	Percentage (%)
Poor	1	6,7
Sufficient	2	13,3
Good	12	80,0
Total	15	100

Based on the conducted statistical analysis, the primary findings of the study regarding the effectiveness of the short video media educational intervention on improving primigravida women's knowledge of colostrum benefits can be presented. The results of the Wilcoxon test indicated a significant change between the measurements taken before and after the intervention ( $p < 0.05$ ).

Table 4. Contingency table of pre-test and post-test knowledge levels

Pre-test knowledge	Post-test knowledge						Total Pre-test		<i>P value</i>
	Poor		Sufficient		Good				
	n	%	n	%	n	%	f	%	



Poor	1	6,7	1	6,7	5	33,3	7	46,7	0,004
Sufficient	0	0,0	1	6,7	4	26,7	5	33,3	
Good	0	0,0	0	0,0	3	20,0	3	20,0	
Total Post-test	1	6,7	2	13,3	12	80,0	15	100	

#### 4. Discussions

The demographic characteristics of pregnant women, particularly their age, play a significant role in determining pregnancy outcomes. The majority of pregnant women in the study were within the non-risk age group of 20-35 years, which is considered ideal for reproductive health and is associated with a lower risk of adverse pregnancy outcomes. This aligns with findings from the Indonesian Ministry of Health, which emphasizes the protective nature of this age range against complications such as preeclampsia, preterm birth, and low birth weight (LBW) (Sudirman et al., 2023; Sukendar et al., 2024). However, the presence of a minority (20%) in the at-risk age categories (<20 and >35 years) necessitates targeted health interventions for these groups to mitigate potential complications.

Regarding educational background, the data reveals that the vast majority of respondents (86.7%) had attained a mid-to-low level of education, with 40% classified as a low educational level, 46.7% a Senior High School, 13.3% had received tertiary education. This configuration is significant because a mother's educational level is closely correlated with her health literacy, which encompasses the understanding of health information, nutrition, and antenatal care. Mothers with higher education tend to possess better access to and an enhanced ability to comprehend health information, making them more likely to adopt positive health behaviours (Fitriyah et al., 2022; Nurlaily Z et al., 2023; Trianingsih et al., 2024). This finding underscores the necessity for health intervention materials to be simplified, employing easily understandable language and utilising communication media appropriate for the literacy level of the majority group (Raru et al., 2022).

The occupational characteristics indicate that a significant majority of respondents (80%) were unemployed. This profile is commonly observed among pregnant women populations in various research settings. Employment status can serve as an indicator of socio-economic dynamics. On one hand, this situation may potentially allow mothers more time to seek health information and attend antenatal (Vigoureux et al., 2023). Conversely, it may also reflect economic dependency that could potentially become a source of stress or



limit access to health resources when facing financial constraints (Livingston et al., 2025; Sinclair et al., 2022; Sommet & Spini, 2022). Therefore, social support, both from partners and family, becomes a crucial factor for this group to ensure they can utilize their available time to enhance health behaviors without being burdened by financial vulnerabilities (Lobel & Preis, 2025; Rokicki et al., 2023; Wellington, 2023).

Initial measurement results (pre-test) revealed that most primigravida pregnant women had inadequate knowledge regarding the benefits of colostrum, with 46.7% categorized as having poor knowledge and 33.3% in the sufficient category. Only 20.0% of respondents demonstrated good understanding. These findings are consistent with previous research confirming that primigravida women often experience significant knowledge gaps regarding early breastfeeding practices, including understanding of colostrum's composition and advantages compared to mature breast milk. These gaps can lead to early weaning and other breastfeeding challenges (Asni et al., 2023; Ntarelli et al., 2024). The lack of previous information exposure and absence of direct breastfeeding experience are suspected to be contributing factors to the predominance of knowledge in the poor and sufficient categories (Cutler et al., 2024; Ntarelli et al., 2024; Yulianie, 2016).

The study demonstrates the effectiveness of educational intervention using short video media in improving primigravida pregnant women's knowledge about colostrum benefits. Pre-test data revealed that before the intervention, the majority of respondents (80%) had knowledge ranging from poor to sufficient, with only 20% possessing good knowledge. This low baseline knowledge level among primigravida women is consistent with previous literature, which often associates it with lack of direct experience, inadequate information exposure during antenatal care, and the prevalence of misinformation or cultural myths surrounding breastfeeding. This initial knowledge level indicates vulnerability and underscores the necessity for structured educational interventions to build a solid foundation for optimal breastfeeding practices (Kaleem et al., 2017; Rai et al., 2023; Samaria, 2024).

A dramatic improvement was observed in the post-test results, with 80% of respondents now categorized as having good knowledge, highlighting the significant potential of short video media as an effective health education tool. This enhancement aligns with modern learning theory principles, which posit that audiovisual content is superior in capturing attention, facilitating deeper information processing, and improving long-term





memory retention compared to traditional lecture-based methods. The concise and well-structured video format enabled the effective communication of complex information regarding the immunological composition and protective benefits of colostrum in a manner that was both easily digestible and memorable (Barideaux & Pavlik, 2023; Dayasni Ratneswaren et al., 2023; Mayer, 2024; Trenholm & Marmolejo-Ramos, 2024). These findings are consistent with research, who similarly reported significant improvements in maternal health knowledge and neonatal care practices following video-based interventions (Cherie et al., 2025; Haryanti et al., 2023; Joy et al., 2023).

Based on the Wilcoxon test results and contingency table analysis, this study demonstrates the statistically significant effectiveness of the short video intervention in enhancing primigravida women's knowledge of colostrum benefits. The remarkable shift from merely 20% of respondents possessing good knowledge during the pretest to 80% in the posttest indicates that audiovisual media successfully transmitted complex information about colostrum's immunological composition and protective advantages in an accessible and memorable format. This improvement corresponds with social cognitive theory principles, wherein observational learning (modeling) demonstrated through videos effectively enhances individual self-efficacy and knowledge (Fazira et al., 2023; Jagadeesh et al., 2024; Sheela & George, 2021).

Further analysis of the contingency table reveals not only overall improvement but also internal knowledge shifts at the individual level. Among the seven respondents initially classified with poor knowledge, five showed improvement to at least the sufficient category, with one advancing directly to the good category. Similarly, four of the five respondents with initially sufficient knowledge and all three respondents who began with good knowledge maintained or further enhanced their knowledge levels. This pattern indicates that the intervention was not only effective for the low-knowledge group but also beneficial for reinforcing and consolidating understanding among participants with higher baseline knowledge. This success is strongly attributed to the repetitive and consistent learning opportunities afforded by video media characteristics, thereby reducing misinformation and fostering comprehensive understanding (Gopi M et al., 2024; Lukmawati et al., 2022).

The success of this intervention can be effectively explained through the theoretical framework of the Health Belief Model. The video likely succeeded not only in enhancing



perceived susceptibility by elucidating the risks associated with not providing colostrum but also significantly increased perceived benefits by emphasizing the protective advantages and nutritional value of colostrum (Jagadeesh et al., 2024; Mohammadi et al., 2024). Furthermore, by demonstrating proper colostrum feeding techniques, the video potentially enhanced maternal self-efficacy, thereby increasing confidence in future practice (Sari & Fajri, 2022; Yuliani et al., 2022). From a pedagogical perspective, video-based education aligns with the preferences of modern generations for accessible (on-demand), repetitive information delivered through familiar mobile devices (Putri & Anggraeni, 2023).

The implications of this study are substantial for maternal healthcare services. The integration of standardized short video media into routine antenatal care counseling presents a cost-effective and scalable strategy to improve the coverage and quality of lactation education, particularly in regions with limited healthcare workforce capacity (Dewanti et al., 2024; Fazira et al., 2023). These videos can be utilized in clinic waiting areas, distributed through instant messaging platforms, or uploaded to digital channels of Puskesmas, thereby extending their reach to pregnant women beyond limited clinical visits. Further research is necessary to examine the long-term impact of this intervention on actual colostrum provision and exclusive breastfeeding practices, as well as to explore the combination of video media with peer group support for more sustainable outcomes (Olla & Jumetan, 2023; Widayati et al., 2022).

Despite its promising findings, this study has several limitations that should be acknowledged. First, the use of a pre-experimental one-group pretest-posttest design without a control group limits the ability to definitively attribute the observed knowledge increase solely to the video intervention, as external factors such as history or maturation could not be ruled out (Gadade et al., 2024; Knapp, 2016). Second, the small sample size ( $n=15$ ), while acceptable for a pre-experimental pilot study, restricts the generalizability (external validity) of the findings to a broader population. Third, knowledge was measured immediately after the intervention, which only captures short-term knowledge retention and not the long-term behavioral impact on actual colostrum feeding practices (Büyük et al., 2023; Hidayanti & Aryani, 2024).

Future research should address these limitations by employing a more robust design, such as a randomized controlled trial (RCT) with a larger sample size, to strengthen causal



inference and enhance the generalizability of the results. Longitudinal studies are also crucial to assess the sustainability of knowledge retention over time and, more importantly, to evaluate the ultimate impact of the intervention on behavioral outcomes, namely the rates of early initiation of breastfeeding and exclusive breastfeeding. Furthermore, investigating the effect of combining short video education with interactive reinforcement strategies, such as peer support groups or follow-up messaging, could provide insights into creating more comprehensive and effective educational models.

## 5. Conclusion

This study provides compelling evidence that a short video education intervention is a highly effective tool for significantly improving knowledge regarding the benefits of colostrum among primigravida women. The statistically significant increase in knowledge scores post-intervention demonstrates the potential of this accessible, standardized, and engaging medium to overcome educational barriers in a low-resource setting. The findings underscore the value of integrating innovative digital health tools, such as educational short videos, into routine antenatal care counseling to bridge knowledge gaps. Ultimately, equipping first-time mothers with accurate information is a critical foundational step towards improving early breastfeeding practices, thereby contributing to better neonatal health outcomes and supporting the achievement of national and global breastfeeding targets.

## 6. Conflict of interest

All authors declare no conflict of interest.

## 7. References

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