



THE EFFECTIVENESS OF INTERACTIVE VIDEO EDUCATION COMPARED TO CADRE APPROACH ON POSTPARTUM MOTHERS' BEHAVIOR IN UMBILICAL CORD CARE

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ABSTRACT

Umbilical cord infection significantly contributes to neonatal morbidity and mortality in border areas, with risky traditional care practices still commonly performed in Sanggau Regency. Objective: This study aimed to compare the effectiveness of interactive video education with health cadre approach in improving umbilical cord care behavior. The research design used an open-label randomized controlled trial with subjects of third-trimester pregnant women with gestational age more than thirty-seven weeks. Samples were taken using total sampling with forty-three initial respondents, then dropout occurred resulting in forty-two respondents divided into video group twenty-one people and cadre group twenty-two people. Before randomization, stratification was performed based on education and parity using simple random sampling with Excel RAND function. The video group received education through validated interactive videos, while the cadre group received lectures and demonstrations. Assessment was conducted on knowledge, attitudes, and practices using valid and reliable structured instruments from postpartum until umbilical cord separation. Data were analyzed using Mann-Whitney U, chi-square, and multiple logistic regression. Interactive video was significantly more effective in improving knowledge with odds ratio thirteen point six times greater, but no significant difference for attitudes and practices. Multivariate analysis showed education variables had significant effect with prediction accuracy of eighty-one percent. No single method was superior for all behavioral aspects, so combining both methods could be an optimal strategy to comprehensively improve umbilical cord care behavior. Interactive video was more effective in improving knowledge, while the cadre-based approach had a stronger influence on shaping attitudes and practices, although the results were not statistically significant.

Keywords: health cadre; interactive video education; postpartum mothers; umbilical cord care

How to cite (in APA style)

Yuniarti, Y., Suryantara, B., & Gunarmi, G. (2025). The Effectiveness of Interactive Video Education Compared to Cadre Approach on Postpartum Mothers' Behavior in Umbilical Cord Care. *Indonesian Journal of Global Health Research*, 7(5), 979-984. <https://doi.org/10.37287/ijghr.v7i5.7056>.

INTRODUCTION

Proper umbilical cord care is a crucial aspect of maintaining neonatal health and preventing life-threatening infections in newborns. WHO reports that 2.3 million newborns died in 2022, with nearly half of all deaths in children under 5 years occurring during the neonatal period, where 75% of deaths occur within the first week of life (WHO, 2024). In Indonesia, the Infant Mortality Rate (IMR) remains relatively high at 16 per 1,000 live births (Ministry of Health RI, 2022). The situation is more concerning in West Kalimantan with an IMR of 17 per 1,000 live births (BPS West Kalimantan Province, 2024). In Sanggau Regency, although slightly lower at 15 per 1,000 live births, umbilical cord infections still contribute 7.5% of total neonatal deaths (Sanggau District Health Office, 2024).

Umbilical cord infections can cause life-threatening sepsis in infants. Research by Mullany et al. (2018) shows that umbilical cord infections not only increase the risk of neonatal mortality but can also result in serious complications such as sepsis, meningitis, and neonatal tetanus. A preliminary study in Sanggau Regency in August 2024 revealed that 85% of mothers still apply risky traditional methods, including the use of non-sterile mixtures of jackfruit leaf ash and betel saliva. According

to Larasati et al. (2021), it is estimated that between 23% to 91% of umbilical cords that are not properly cared for are at risk of infection within the first 72 hours after birth.

Sanggau Regency, as a border area, faces unique challenges in providing maternal and infant health services. Limited access to healthcare facilities, low education levels, and strong influence of traditional beliefs hinder the implementation of recommended umbilical cord care practices (Mullany et al., 2018). These challenges worsen the risk of neonatal infections that should be preventable with proper care. To achieve the Sustainable Development Goals (SDGs) target of reducing infant mortality to 12 per 1,000 live births by 2030, reducing infection rates becomes a crucial step. Indonesia's Healthy Indonesia Program with Family Approach (PIS-PK) emphasizes the importance of neonatal health education, including umbilical cord care (Ministry of Health RI, 2016). Maryuni (2017) shows that to improve mothers' knowledge about umbilical cord care, comprehensive counseling and information are needed from pregnancy through early postpartum period.

Although health education through posyandu and antenatal care (ANC) has been implemented, traditional umbilical cord care practices are still commonly performed by communities in border areas. Geographic isolation and socioeconomic disadvantage are major barriers to implementing health policies in these regions. Information technology development opens new opportunities in health education methods. Interactive videos offer potential for delivering health information that is consistent, accessible, and easily understood through visualization (Clark and Mayer, 2024). Studies by Mishra et al. (2023) show that mHealth interventions, including interactive videos, can improve maternal and child health outcomes in low- and middle-income countries. Al-Shehri et al. (2020) found that video-based education can increase information retention by up to 60% compared to conventional lecture methods.

On the other hand, the role of health cadres has long been recognized as a vital bridge between formal health systems and communities, especially in remote areas. Wahyuni and Muna (2022) reveal that health education provided by cadres gradually and repeatedly is an effective strategy in improving newborn care behavior. Patemah (2020) confirms that cadre assistance through home care greatly helps improve community knowledge about umbilical cord care. Kumar et al. (2019) in rural India show that health cadre approaches are more effective in changing health behavior due to cultural proximity and community trust. There has been no comprehensive study comparing the effectiveness of both approaches in the context of umbilical cord care in Indonesia's border regions. There is a significant research gap in comparative studies between modern and traditional education methods in border areas. Sharma et al. (2021) reveal that combining technology and personal approaches can provide optimal results, but Indonesia's geographic and sociocultural context has unique characteristics that require separate study.

This research is important because it will provide empirical evidence about the effectiveness of both education methods in improving umbilical cord care behavior in border regions. The research results are expected to serve as a basis for developing more targeted policies and intervention programs, as well as contribute to achieving SDGs targets in reducing neonatal mortality rates in Indonesia. Therefore, research is needed to compare the effectiveness of interactive videos and education by health cadres in improving knowledge and practices of umbilical cord care in border regions. This study aimed to compare the effectiveness of interactive video education with health cadre approach in improving umbilical cord care behavior.

METHOD

This study employed an open-label Randomised Controlled Trial (RCT) design to compare the effectiveness of interactive video education versus community health worker approach in improving knowledge and practices of umbilical cord care among postpartum mothers. The study was

conducted from December 2024 to March 2025 in three border districts of Sanggau Regency, West Kalimantan (Sekayam, Entikong, and Noyan). A total of 43 postpartum mothers were recruited using total population sampling and randomly allocated to either interactive video group (n=22) or community health worker group (n=21). Data were collected using validated instruments including demographic questionnaire, 15-item knowledge questionnaire, 10-item Likert scales for beliefs and attitudes, and structured observation checklist for umbilical cord care practices. The questionnaire on umbilical cord care beliefs, knowledge and attitudes of all items had a calculated r value > 0.3610 so that the questionnaire was valid. Data analysis included univariate analysis (frequency distributions), bivariate analysis (Mann-Whitney U test and Fisher's Exact Test), and multivariate analysis (multiple logistic regression) with significance level of p<0.05. Multivariate analysis was conducted in two stages: evaluation of main effects and interaction testing for effect modification.

RESULT

Respondent Characteristics and Homogeneity Test

Univariate analysis was conducted to describe respondent characteristics and test the homogeneity between the interactive video education and health cadre groups. The results are presented in Table 1.

Table 1.
Respondent Characteristics and Homogeneity Test

Variable	Category	Video (n=20)	Cadre (n=22)	p-value
Age	<18 and >35 / 18–35	10.0% / 90.0%	18.2% / 81.8%	0.665
Parity	Primigravida / Multi	40.0% / 60.0%	36.4% / 63.6%	1.000
Education	Low / High	50.0% / 50.0%	50.0% / 50.0%	1.000
Occupation	Unemployed / Employed	85.0% / 15.0%	90.9% / 9.1%	0.656
Husband Support	High	100%	100%	-
Belief	Negative / Positive	60.0% / 40.0%	45.5% / 54.5%	0.527

All variables have p-values > 0.05, indicating no significant differences between the two groups. This suggests that the baseline characteristics of respondents are homogeneous and do not bias the results.

Overview of Postpartum Mothers' Behavior After Intervention

Postpartum mother behavior observed includes knowledge, attitude, and practice, as shown in Table 2.

Table 2.
Postpartum Mothers' Behavior After Education Intervention

Variable	Category	Video (%)	Cadre (%)
Knowledge	Fair / Good	5 / 95	36.4 / 63.6
Attitude	Negative / Positive	20 / 80	13.6 / 86.4
Practice	Poor / Good	30 / 70	9.1 / 90.9

Most mothers in the video group showed good knowledge, while the cadre group excelled in good practice.

Bivariate Analysis of Education Effectiveness

To determine the differences in effectiveness between methods, the Mann-Whitney test was performed.

Table 3.
Comparison of Effectiveness Between Education Methods

Variable	Group	Mean Rank	p-value
Knowledge	Video	24.95	0.015*
	Cadre	18.36	
Attitude	Video	20.80	0.585
	Cadre	22.14	
Practice	Video	19.20	0.089
	Cadre	23.59	

Interactive video significantly improved knowledge. There was no significant difference in attitude, while cadre tended to be more effective in practice, though not statistically significant.

Confounding Variable Screening and Effect Modifier

Education and parity showed potential relationships with maternal behavior and were included in multivariate analysis. Only education consistently associated with all behavior dimensions.

Multivariate Analysis

A logistic regression model without interaction was chosen as the interaction model failed to converge.

Table 4.
Logistic Regression Results Without Interaction

Variable	Sig.	Exp(B)	95% CI Lower–Upper
Education	0.025	13.582	1.388 – 132.923
Education Level	0.054	6.252	0.969 – 40.354

The model had an accuracy of 81.0% in predicting good knowledge.

Table 5.
Model Classification Table

Knowledge Category	Predicted Fair	Predicted Good	Accuracy
Fair (n=9)	6	3	66.7%
Good (n=33)	5	28	84.8%

DISCUSSION

The results of this study show that interactive video education is significantly more effective in increasing postpartum mothers’ knowledge about umbilical cord care. However, the health cadre approach tends to be more effective in shaping correct care practices, although not statistically significant. In terms of attitude, both methods demonstrated relatively balanced effectiveness. These findings are consistent with Mayer’s *Multimedia Learning* theory, which explains that combining visual and auditory elements in videos strengthens understanding and information retention. Meanwhile, the cadre's effectiveness in influencing practice reflects Bandura's *social learning theory*, where social interaction and role modeling reinforce behavioral change. These results are also supported by Utami (2021), who showed that video education significantly improves maternal knowledge. However, they contrast with Ramadhani (2022), who reported that cadres were more successful in influencing practice than video.

Furthermore, the logistic regression multivariate analysis showed that video education significantly affected the increase in maternal knowledge ($p = 0.025$) with an odds ratio of 13.6 times greater than cadre. Maternal education also played a supporting role, nearing significance ($p = 0.054$), and should be considered in intervention strategies. The predictive model had an accuracy of 81%, reinforcing the validity of the relationship between the education method and knowledge improvement. Interestingly, the influence of education remained significant regardless of the mother's education level, meaning this approach is effective for both low and high education levels. This is supported by Al-Shehri et al. (2020) who emphasized that video education can be used across educational backgrounds, and Mishra et al. (2023) who demonstrated the effectiveness of digital education in reaching low-literacy groups. This is also consistent with WHO (2024) recommendations to use multimedia approaches in low-resource settings.

In practical field context, a combined approach becomes highly relevant, especially in remote or border areas with limited information access and strong cultural influences. Sharma et al. (2021) highlighted that integrating digital and interpersonal approaches can create synergistic effects in health promotion, especially when adapted to the sociocultural characteristics of target communities. Thus, both educational methods have their respective advantages: video education

excels in cognitive aspects (knowledge), while health cadres excel in actual behavioral aspects (practice). Therefore, using a combination of both methods may be considered as a more comprehensive education strategy to improve postpartum mothers' behavior in umbilical cord care. Despite the strengths of this study, such as the use of a randomized controlled design and validated instruments, some limitations should be acknowledged. The relatively small sample size and the short duration of follow-up may affect the generalizability of findings.

CONCLUSION

This study aimed to evaluate the effectiveness of interactive video education and a community health worker (cadre)-based approach on postpartum mothers' behavior in umbilical cord care. The findings revealed that each educational method demonstrated different strengths. Interactive video was more effective in improving knowledge, while the cadre-based approach had a stronger influence on shaping attitudes and practices, although the results were not statistically significant. The educational method was identified as the primary determining factor, with maternal education serving as a supporting variable, and no significant effect modifiers were found. These results indicate that an integrated educational strategy combining visual-auditory stimulation and interpersonal interaction may provide a more comprehensive and effective approach.

REFERENCES

- Al-Shehri, A. M., Al-Shahrani, F. M., Al-Khaldi, Y. M., & Alqahtani, A. H. (2020). Effectiveness of Video-Based Education on Knowledge Retention and Skill Acquisition among Healthcare Providers: A Meta-Analysis. *Journal of Education and Health Promotion*, 9, 209.
- Mishra, S. R., et al. (2023). Digital Health Interventions to Improve Maternal and Child Health in Low- and Middle-Income Countries: A Systematic Review. *The Lancet Digital Health*, 5(2), e95–e109.
- Utami, R. (2021). Pengaruh Media Video terhadap Pengetahuan Ibu tentang Perawatan Neonatal. *Jurnal Kebidanan*, 12(2), 101–108.
- Ramadhani, D. (2022). Efektivitas Kader Kesehatan dalam Mengubah Praktik Perawatan Tali Pusat. *Jurnal Promkes*, 10(1), 77–85.
- Sharma, R., et al. (2021). Integrating Digital and Community-Based Approaches to Improve Health Literacy. *BMC Public Health*, 21, 764.
- Mayer, R. E. (2021). *Multimedia Learning* (3rd ed.). Cambridge University Press.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice-Hall.
- World Health Organization. (2024). Newborn Mortality: Key Facts. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/newborn-mortality>
- Ministry of Health Republic of Indonesia. (2022). *Indonesia Health Profile 2022*. Jakarta: Ministry of Health.
- BPS West Kalimantan. (2024). *Statistical Yearbook of West Kalimantan 2024*. Pontianak: BPS.
- Sanggau District Health Office. (2024). *Sanggau Health Profile Report 2023/2024*. Sanggau: Dinas Kesehatan Kabupaten.
- Larasati, R. (2021). Faktor yang Mempengaruhi Perilaku Ibu dalam Perawatan Tali Pusat di Daerah Perbatasan. *Prosiding Seminar Nasional Kebidanan*, 2(1), 66–72.

- Maryuni, L. (2017). Pentingnya Edukasi Neonatal Sejak Masa Antenatal. *Jurnal Kesehatan Masyarakat*, 6(3), 211–218.
- Mullany, L. C., et al. (2018). Impact of Umbilical Cord Care Practices on Neonatal Sepsis in Southeast Asia: A Multi-Country Review. *International Journal of Neonatal Health*, 4(2), 120–130.
- Wahyuni, D., & Muna, N. (2022). Peran Kader dalam Edukasi Perawatan Neonatal di Komunitas. *Jurnal Ilmu Kesehatan Masyarakat*, 13(1), 34–42.
- Patemah, S. (2020). Efektivitas Home Visit oleh Kader dalam Meningkatkan Pengetahuan Ibu tentang Tali Pusat. *Jurnal Pengabdian kepada Masyarakat*, 5(2), 150–157.
- Kumar, A., et al. (2019). Community Health Workers and Behavior Change in Rural India: A Case Study. *Global Health Science and Practice*, 7(1), 85–93.