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The Effect of Video-Based Education on Pregnant Women's Knowledge Regarding Triple Elimination Screening

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Abstract

Introduction: Maternal to child transmission of infectious diseases such as HIV, syphilis, and hepatitis B remains a major global health concern. The "Triple Elimination" program integrates early detection and prevention strategies for these infections within maternal health services. However, limited maternal knowledge and awareness impede optimal screening participation, especially in developing regions. Educational interventions using audiovisual media such as videos have shown promise in improving maternal understanding and promoting health-seeking behavior.
Objective: To determine the effect of video-based education on the knowledge of pregnant women regarding triple elimination screening at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu.
Method: A quasi-experimental study with a one-group pretest-posttest design was conducted among 32 pregnant women attending antenatal care (ANC) during October–November 2025. Participants received an educational intervention using a health education video about triple elimination. Data on knowledge were collected using a validated questionnaire, and statistical analysis was performed using the Wilcoxon signed-rank test with a significance level of $p < 0.05$.
Result: The median knowledge score before the intervention was 13 (minimum 5; maximum 15), while after the intervention it increased to 16 (minimum 13; maximum 16). Statistical analysis revealed a significant difference in pretest and posttest scores ($p < 0.001$), indicating that video-based education effectively improved maternal knowledge.
Conclusion: Video-based education significantly enhances pregnant women's knowledge regarding triple elimination screening. The use of audiovisual media in maternal health education should be integrated into antenatal services to strengthen awareness and early detection of HIV, syphilis, and hepatitis B.

Keywords: pregnant, upper respiratory tract infection, video-based education

Introduction

Maternal and child health has long been a global priority under the Sustainable Development Goals (SDG 3), which aim to ensure healthy lives and promote well-being for all at all ages. One of the most pressing challenges within this goal is the prevention of mother-to-child transmission (MTCT) of infectious diseases such as human immunodeficiency virus (HIV), syphilis, and hepatitis B. These infections continue to cause preventable morbidity, mortality, and long-term complications in infants worldwide, particularly in low- and middle-income countries (WHO, 2022). Despite the availability of effective screening and preventive interventions, many women still do not undergo the recommended tests during pregnancy due to limited awareness, accessibility, and education (Wardana & Triguno, 2022).

In response, the Indonesian Ministry of Health launched the Triple Elimination Program, which integrates screening for HIV, syphilis, and hepatitis B into routine antenatal care (ANC) services (Kementerian Kesehatan RI, 2019). This program is part of a global movement endorsed by the World Health Organization (WHO) to achieve the elimination of MTCT of these infections by 2030. However, the success of such initiatives is highly dependent on the knowledge and attitudes of pregnant women toward the importance of screening. Several studies have shown that insufficient maternal knowledge remains a critical barrier to effective implementation of triple elimination strategies, resulting in persistently low testing rates across several Indonesian regions (Ayunda et al., 2023; Warliana, 2022).

Knowledge serves as the foundation for behavioral change in health promotion. According to Notoatmodjo's (2018) Health Behavior Theory, awareness and understanding are essential precursors to motivation and compliance. Pregnant women who are well informed about the risks of vertical transmission are more likely to consent to testing, adhere to preventive measures, and seek timely treatment. Unfortunately, health education practices in many healthcare settings remain limited to verbal counseling or printed materials, which often fail to engage or effectively convey complex biomedical information. This gap highlights the need for innovative, engaging, and culturally appropriate educational strategies that can enhance comprehension and retention.

Video-based education has emerged as a promising approach in this regard. By combining visual and auditory stimuli, video media deliver health information in an interactive and easily understandable format. Studies have demonstrated that audiovisual learning significantly improves knowledge acquisition, motivation, and behavioral intentions among pregnant women compared to traditional education methods (Ismail & Yona, 2023; Nuraeni, 2023). Furthermore, videos can standardize the quality of educational messages, ensuring that all recipients receive consistent, evidence-based information regardless of the educator's communication style or time constraints (Chelberg & Mahoney, 2023).

In developing regions such as East Nusa Tenggara, Indonesia, challenges such as low health literacy, limited health personnel, and geographic isolation hinder effective health communication. At RSUD Mgr. Gabriel Manek, SVD., Atambua one of the main referral hospitals in Belu Regency antenatal services are provided to women from both urban and rural areas, many of whom have limited access to reliable health information. Implementing video-based educational interventions in this context may therefore serve as a practical and sustainable solution to overcome these barriers. Through culturally tailored videos presented during ANC visits, healthcare providers can efficiently communicate essential messages about triple elimination screening in a way that resonates with local communities.

Empirical evidence supports the integration of audiovisual education into maternal health programs. A study by Puspasari (2019) found that educational interventions

significantly increased maternal participation in HIV, syphilis, and hepatitis B screening programs. Similarly, research by Campani et al. (2023) on mobile health applications in Tanzania showed that digital health tools enhanced women's understanding and engagement during pregnancy. In the Indonesian context, Nuraeni (2023) reported a marked improvement in pregnant women's knowledge and willingness to participate in triple elimination screening after exposure to video-based education. These findings collectively indicate that multimedia learning is not only effective but also adaptable across diverse socio-cultural environments.

Beyond individual benefits, the application of video-based education has broader public health implications. It supports national digital transformation strategies and aligns with WHO's call for innovative approaches to accelerate the elimination of MTCT (WHO, 2022). By reducing dependency on human resources and offering a scalable, cost-effective mode of delivery, video-based education can enhance the efficiency of ANC services. Once developed, videos can be disseminated widely through hospital waiting areas, community health centers, or mobile platforms, maximizing outreach while minimizing additional costs. Such integration also promotes equity, ensuring that even women in remote areas receive the same quality of information as those in urban centers.

Despite its advantages, the utilization of video-based education in maternal health in Indonesia remains limited. Few studies have systematically examined its effectiveness within the triple elimination framework, particularly in low-resource settings such as Atambua. Understanding its impact is therefore crucial for informing future program development and policy-making. Moreover, evidence-based insights into how audiovisual tools influence maternal knowledge can contribute to refining health education strategies and achieving Indonesia's triple elimination targets.

Given these considerations, the present study was conducted to evaluate the effect of video-based education on pregnant women's knowledge regarding triple elimination screening at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu. This study seeks to answer the question: Does video-based education significantly improve the knowledge of pregnant women about triple elimination screening compared to their baseline understanding? The findings are expected to provide empirical support for the adoption of video-assisted learning as an innovative health promotion strategy within antenatal care, ultimately contributing to the national effort to eliminate vertical transmission of HIV, syphilis, and hepatitis B.

Objective

To analyze the effect of video-based education on the knowledge of pregnant women regarding triple elimination screening at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu.

Method

Design and Setting

This research employed a quasi-experimental design with a one-group pretest-posttest approach. The study was conducted at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu, during October to November 2025.

Population and Sampling

The study population included all pregnant women attending their first antenatal care (ANC) visit at RSUD Mgr. Gabriel Manek, SVD. A total of 32 respondents were selected through purposive sampling, meeting the inclusion criteria of being in their first or second trimester, able to communicate in Indonesian, and willing to participate voluntarily.

Instrument and Measurement

Data were collected using a structured knowledge questionnaire about triple elimination, adapted from previous validated instruments (Budiman & Riyanto, 2012; Notoatmodjo, 2018). The questionnaire consisted of 16 items covering the definition, objectives, benefits, and timing of triple elimination screening, as well as knowledge about HIV, syphilis, and hepatitis B.The instrument had been tested for validity (r = 0.75–0.89) and reliability (Cronbach's α = 0.86), ensuring consistent measurement of maternal knowledge.

Data Collection and Analysis

The intervention involved showing participants a 10-minute educational video explaining the triple elimination program. Pretest questionnaires were administered before the video, followed by the posttest immediately after. Data were analyzed using SPSS version 26.0, applying the Wilcoxon signed-rank test to compare pre- and post-intervention scores, with significance set at $p < 0.05$.

Result

Table 1. Knowledge Scores Before and After Video-Based Education

Variable	Median	Minimum	Maximum	p-value
Pretest	13	5	15	<0.001
Posttest	16	13	16	

The results show a significant improvement in pregnant women's knowledge after receiving video-based education, as indicated by the Wilcoxon test ($p < 0.001$).

Discussion

The findings of this study demonstrate that video-based education significantly improves the knowledge of pregnant women regarding triple elimination screening at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu. Statistical analysis revealed a highly significant difference between pretest and posttest knowledge scores ($p < 0.001$), indicating that video media are an effective educational tool for enhancing understanding and awareness among expectant mothers. These findings are consistent with previous studies reporting that audiovisual educational interventions significantly improve maternal knowledge related to the triple elimination program. Nuraeni (2023) showed that pregnant women who received video-based education experienced greater knowledge improvement compared to those who received conventional counseling, while Ismail and Yona (2023) emphasized that audiovisual materials increase engagement, motivation, and information retention among pregnant women. The present study supports and extends these findings by demonstrating the effectiveness of video-based education in a resource-limited setting in East Nusa Tenggara, highlighting that technology-assisted education can be successfully implemented even in rural or peripheral health systems.

Further support for these findings comes from Puspasari (2019), who reported that educational interventions significantly influence maternal participation in HIV, syphilis, and hepatitis B screening programs. Education plays a crucial role in empowering pregnant women to make informed decisions regarding their own health and that of their unborn

children. This aligns with Notoatmodjo's Health Behavior Theory (2018), which explains that behavior change follows a hierarchical process beginning with knowledge acquisition, followed by attitude formation and behavioral practice. Therefore, the significant increase in knowledge observed in this study represents not only an academic outcome but also an essential foundation for behavioral change, particularly in improving compliance with antenatal screening recommendations.

The results further showed that the median knowledge score increased from 13 to 16 after the video-based educational intervention, approaching the maximum possible score. This indicates that the intervention achieved near-optimal knowledge levels among participants. The minimal variation in posttest scores suggests that the video was uniformly effective across different age and educational backgrounds. This effectiveness can be attributed to key characteristics of video-based learning, including the integration of visual illustrations and narrative explanations that simplify complex biomedical concepts, standardization of message delivery that minimizes variability in counseling quality, and the opportunity for self-paced learning that enhances comprehension. These findings are also consistent with Bandura's Social Cognitive Theory (1986), which emphasizes observational learning as a critical mechanism for behavior acquisition. Through video demonstrations, pregnant women can observe simulated health behaviors, such as undergoing antenatal screening and interacting with healthcare providers, thereby enhancing self-efficacy and motivation to adopt similar behaviors.

The contextual setting of this study in Atambua, East Nusa Tenggara, further strengthens its significance. This region faces persistent challenges related to health literacy, limited access to healthcare information, and lower levels of digital exposure compared to urban areas. Nevertheless, the results indicate that well-designed educational videos can function as an effective equalizer, bridging information gaps and facilitating equitable health communication. These findings suggest that integrating video-based education into routine antenatal care services may enhance the efficiency of knowledge dissemination while reducing dependence on limited human resources. Moreover, the use of culturally adapted video content incorporating local language, community figures, and relevant examples could further improve engagement and sustainability of health promotion efforts.

In relation to the national triple elimination program, which aims to prevent mother-to-child transmission of HIV, syphilis, and hepatitis B, this study provides empirical support for strengthening health literacy interventions. Despite national efforts, screening coverage remains suboptimal, with maternal knowledge deficits identified as a major barrier (Kemenkes RI, 2019). Video-based education offers a scalable and efficient model for antenatal counseling in both public and private health facilities and may accelerate progress toward achieving the World Health Organization's 2030 target for elimination of mother-to-child transmission.

From a clinical and public health perspective, integrating educational videos into antenatal care services has multiple advantages. Clinically, it can standardize counseling quality and ensure consistent delivery of critical information, even in high-volume or resource-constrained settings. From a public health standpoint, video-based education is cost-effective, scalable, and allows repeated exposure to health messages, reinforcing learning and supporting long-term retention. This approach also has potential applicability for other maternal health initiatives, including breastfeeding promotion, birth preparedness, and family planning education, and aligns with Indonesia's National Digital Health Transformation Strategy.

Despite its strengths, this study has limitations, including the use of a single-group pretest–posttest design without a control group and the assessment of knowledge outcomes immediately after the intervention, which limits conclusions regarding long-term retention and behavior change. Future studies should employ randomized controlled designs, larger sample sizes, longer follow-up periods, and outcome measures that include actual screening behavior and service utilization. Cultural and linguistic adaptations should also be considered to enhance inclusivity and effectiveness.

In conclusion, this study provides strong evidence that video-based education is a feasible, effective, and transformative approach to maternal health education. The significant improvement in knowledge among pregnant women underscores the critical role of innovative digital media in addressing health literacy gaps and supporting preventive health programs. Integrating video-based education into antenatal services should therefore be prioritized as a strategic intervention to strengthen the implementation of the triple elimination program and promote digital health empowerment within Indonesia's healthcare system.

Conclusion

Video-based education significantly improved pregnant women's knowledge about triple elimination screening at RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu. This approach represents an effective, scalable, and engaging method to strengthen health literacy and promote preventive maternal behaviors. Integrating audiovisual health education into ANC services is strongly recommended to support the achievement of national triple elimination targets.

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Author Contribution

All authors contributed equally to the study design, data analysis, and manuscript preparation.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Clearance

Ethical approval for this study was obtained from the Institutional Review Board of RSUD Mgr. Gabriel Manek, SVD., Atambua, Belu (Approval No.: 2025/EC-RSUD/10/025).

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