



Multimedia Health Education for Community Health Cadres: Promoting Cervical Cancer Awareness and Prevention

Endar Timiyatun¹  , Eka Oktavianto¹ , Woro Ispandiyyah² 

¹*Nursing Science Program, Sekolah Tinggi Ilmu Kesehatan (STIKes) Surya Global, Yogyakarta, Indonesia*

²*Public Health Study Program, Sekolah Tinggi Ilmu Kesehatan (STIKes) Surya Global, Yogyakarta, Indonesia*

 Corresponding author: endartimiyatun2@gmail.com

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ABSTRACT

Health education related to cervical cancer is essential for community empowerment, with community health cadres playing a pivotal role in delivering health education at the grassroots level. The use of appropriate educational media has been shown to effectively enhance community knowledge. This study aimed to analyze the effectiveness of educational modules and videos in improving cadres' knowledge and skills in delivering health education on cervical cancer prevention. This quasi-experimental study employed a one-group pretest–posttest design involving 25 community health cadres. The intervention comprised two 90-minute cadre training sessions. The first session included a lecture followed by a question-and-answer discussion, while the second session involved a health education demonstration. Educational videos and modules were used as instructional media. Knowledge data were collected using a structured questionnaire, whereas skills data were assessed using a standardized observation checklist. Data were analyzed using the Wilcoxon signed-rank. The results showed that knowledge score increased from 48.00 (pretest) to 94.00 (posttest), with a mean difference of 46.00 ($p < 0.05$). Similarly, the mean skills score improved from 37.20 (pretest) to 87.20 (posttest), with a mean difference of 50.00 ($p < 0.05$). Educational modules and videos are effective media for enhancing the knowledge and skills of community health cadres in providing health education on cervical cancer prevention. Their use should be integrated into training programs to strengthen cervical cancer prevention efforts at the community level.

Keyword: Cervical cancer, Health education, Cadres, Module, Video, Prevention



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1. Introduction

Cervical cancer is one of the leading causes of mortality among women worldwide, including in Indonesia. Low- and middle-income countries (LMICs) continue to bear the highest burden of cervical cancer-related deaths (Choi et al., 2020). According to the International Agency for Research on Cancer (IARC), there were 408,661 new cases and 242,988 deaths from cancer in Indonesia in 2022. Furthermore, IARC has projected a 77% increase in cancer cases by 2050 (Kemenkes RI, 2024a). Cervical cancer remains a major health threat for women in Indonesia, with more than 90% of cervical cancer incidence and mortality occurring in LMICs (Choi et al., 2020; Sung et al., 2021). Data from GLOBOCAN 2020 reported approximately 36,633 new cervical cancer cases in Indonesia, representing 9.2% of all cancers, with 21,003 deaths (9%) (Sung et al., 2021). Globally, the World Health Organization (WHO) ranked cervical cancer as the fourth most common

cancer among women in 2024, with nearly 350,000 deaths, and noted that almost 99% of cases are linked to human papillomavirus (HPV) infection. In Indonesia, cervical cancer is the second leading cause of cancer-related death among women, with an estimated 36,000 new cases and 21,000 deaths annually (WHO, 2024).

The high incidence and mortality of cervical cancer in Indonesia are largely attributed to the low coverage of screening and delayed detection (Domingo et al., 2008; Tjokroprawiro et al., 2024; Wahidin et al., 2022). Limited awareness and knowledge among women about the importance of Pap smear examinations, combined with socioeconomic and educational barriers, contribute significantly to this issue (Siahaan et al., 2024). In Indonesia, only about 10% of women undergo Pap smear screening. A study at Dr. Soetomo General Hospital in 2023 revealed that among 215 cervical cancer patients, 85.58% had never participated in routine screening, while only 1.86% (n=4) reported regular screening. Moreover, 51.16% of patients experienced diagnostic delays exceeding 12 months after symptom onset (Tjokroprawiro et al., 2024). This problem is closely linked to limited knowledge about the signs and symptoms of cervical cancer and the importance of regular screening (Novelia & Usman, 2025; Siahaan et al., 2024; Tjokroprawiro et al., 2024). Therefore, enhancing women's knowledge regarding cervical cancer and the necessity of early detection through routine screening is essential to prevention efforts (Mirzanie et al., 2019).

To address this burden, WHO has launched a global strategy to eliminate cervical cancer by 2030, with one of its targets being 70% screening coverage among women aged 35–45 years. The Indonesian Ministry of Health (Kemenkes RI) supports this initiative through the National Action Plan (Rencana Aksi Nasional/RAN) for Cervical Cancer Elimination (Kemenkes RI, 2024b, 2024a). Despite the government's efforts to promote cervical cancer prevention programs, several challenges persist, particularly the low participation of communities. The main obstacles are insufficient public awareness, attitudes, and behaviors toward screening, as well as limited knowledge about the program itself (Siahaan et al., 2024; Tjokroprawiro et al., 2024; Wahidin et al., 2022). Sen & Gencturk (2025), further emphasized that community participation and motivation in cervical cancer prevention remain inadequate. It is crucial for all women, especially those at greater risk, to acquire adequate knowledge regarding symptoms, risk factors, preventive measures, early detection, and treatment services for cervical cancer (Kim et al., 2019; Sen & Gencturk, 2025).

Community health workers, as the closest health representatives to the community, play a critical role in cervical cancer prevention. Their involvement and capacity must be strengthened to reduce the emergence of new cases. Given their role as primary health providers at the grassroots level, cadres serve as vital bridges between health services and the community. Health education modules play an important role in dispelling myths and reducing stigma by providing detailed and evidence-based information in a structured format. By incorporating illustrations, narratives, testimonials from individuals with lived experience, and real-world case studies, modules can enhance comprehension and relevance for community members. Previous studies have confirmed the effectiveness of this approach in correcting misconceptions related to cervical cancer (Choi et al., 2020). Educational videos can serve as an effective medium to enhance cadres' capacity to deliver information to the public. The success of community health education relies heavily on appropriate learning components, particularly instructional media. Health education becomes more effective when supported by suitable methods and engaging media (Notoatmodjo, 2018; Oktavianto et al., 2024). Videos, by combining moving images and audio, offer a dynamic dimension to the learning process, enabling communities to better understand and remain engaged (Alamsyah et al., 2020; Setiyawati et al., 2022). Appealing and persuasive media can shape cognitive, affective, and psychomotor domains, aligning with the goals of health education (Notoatmodjo, 2018). This study aimed to analyze the effectiveness of educational modules and videos in improving cadres' knowledge and skills in delivering health education on cervical cancer prevention.

2. Methods

This study employed a quasi-experimental design with a one-group pretest–posttest approach. The design was selected to evaluate the effect of health education interventions using module and video media on improving knowledge and skills of community health cadres in providing health education for cervical cancer prevention. The study involved 25 community health cadres, recruited using purposive sampling. The inclusion criteria were: (1) active participation as a community health or posyandu cadre, (2) willingness to attend the entire training session, and (3) ability to read and understand Indonesian language. The intervention devided into 3 stage. Preparation stage: development of the educational module and video, followed by content validation by experts. The educational media were developed based on stunting prevention guidelines published by the Ministry of Health of the Republic of Indonesia and the World Health Organization (WHO). The two experts comprised one specialist in educational media and one specialist in maternity nursing,

specifically in the area of reproductive health. Implementation stage: training sessions for health cadres, including delivery of educational content using module and video media, and practical exercises on health counseling skills. The cadre training process was evaluated based on participant satisfaction, presenter competence, and the quality of facilities and infrastructure. The intervention consisted of two 90-minute cadre training sessions designed to enhance health education delivery skills. The first session utilized a lecture method accompanied by a structured question-and-answer discussion, whereas the second session emphasized practical learning through a health education demonstration. Educational videos and printed modules served as the primary instructional media. Evaluation stage: administration of pretest prior to the intervention and posttest after the intervention to assess cadres' knowledge and skills. Knowledge pretests and posttests were administered immediately before and after the cadre training, whereas cadre skills were assessed within a few days prior to the intervention and reassessed several days following its completion. The instruments used in this study consisted of: Cervical cancer prevention module, validated by a panel of experts in maternal nursing/reproductive health, health education media, and representatives of community health cadres. Educational video on cervical cancer prevention, presented in an animated format with a duration of approximately 10 minutes. The educational video had a duration of 10 minutes, as it comprehensively covered key content related to covering definition, causes, signs and symptoms, complications, prevention efforts, and cervical cancer screening. The video was shown at the beginning of the training, while the module was used throughout. Knowledge data were obtained using a validated structured questionnaire, while skills data were evaluated through direct observation using a standardized observation checklist designed to assess performance during health education activities. Knowledge and skill questionnaires for cadres, administered during the pretest and posttest sessions to measure changes following the intervention. The questionnaire and observation checklist were developed by the research team, and its content validity was evaluated by experts in maternity nursing. A total of 30 cadres participated in the validity and reliability testing of the questionnaire. The range of validity values was from 0.362 to 0.758 and reliability value was 0.856. Normality of the data was tested using the Shapiro-Wilk test. Since several variables were not normally distributed, the comparison of pretest and posttest scores was analyzed using the Wilcoxon signed-rank test. A significance level of $p < 0.05$ was applied. Ethical standards were upheld by obtaining informed consent from all prospective participants. Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any time without any consequences. Strict confidentiality was maintained by anonymizing respondent data through the use of identification codes rather than names. All participants were treated equally throughout the study. This study received ethical approval from the health research ethics committee STIKes Surya Global Yogyakarta, under approval number 7.29/KEPK/SSG/VII/2025.

3. Results

The study results consist of the validity assessment of the educational module and video, respondent characteristics, and the evaluation of cadres' knowledge and skills in delivering health education. Before being implemented, the module underwent content validity testing by experts in maternal nursing, particularly reproductive health, and by experts in health education media, namely lecturers in medical education. In addition, the module was also assessed by cadres to evaluate readability and comprehensibility. The results of the validity test for the module are presented in Table 1

Table 1 Results of the validity test of the cervical cancer prevention educational module by aspect

Aspect	Number of Indicators	Maximum Score	Obtained Score	Conclusion
Content/Material	5	25	24	Valid
Language	4	20	20	Valid
Presentation	5	25	24	Valid
Visual Design	4	20	19	Valid
Total	18	90	87	Valid

Table 1 presents the results of the module validity test, showing that all aspects scored close to the maximum. The module was therefore considered highly valid and feasible for use as an educational medium in cervical cancer prevention

The video underwent a similar content validity assessment by experts in reproductive health, health education media, and cadres. The results of the validity test for the video are presented in Table 2.

Table 2 Results of the validity test of the cervical cancer prevention educational video by aspect

Aspect	Number of Indicators	Maximum Score	Obtained Score	Conclusion
Content/Material	5	25	24	Valid
Language	4	20	20	Valid
Presentation	5	25	24	Valid
Audio-Visual Design	5	25	24	Valid
Total	19	95	92	Valid

Table 2 shows the validity results of the educational video. Similar to the module, all aspects scored near the maximum, indicating that the video is also highly valid and suitable for use in health education programs.

Table 3 Characteristics of respondents (n = 25)

Characteristics	f	%
Age		
19-59 years	21	84
60-69 years	4	16
Education		
Primary school	0	0
Junior high school	3	12
Senior high school	16	64
Higher education	6	24
Occupation		
Employed	3	12
Unemployed	22	88
Received Cervical Cancer Information		
Yes	18	12
No	7	88
Received Counseling Training		
Yes	8	32
No	17	68
Ever Providing Counseling		
Yes	4	16
No	21	84

The results of the normality test, as a prerequisite for comparative analysis, are shown in Table 4.

Table 4 Results of data normality test (n=25)

Variable	p-value	Conclusion
Knowledge (pretest)	0.013	Not normally distributed
Knowledge (posttest)	0.000	Not normally distributed
Skills (pretest)	0.084	Normally distributed
Skills (posttest)	0.006	Not normally distributed

The data normality test results are shown in Table 4. Knowledge (pretest and posttest) and skills (posttest) were not normally distributed ($p < 0.05$). Therefore, the Wilcoxon non-parametric test was applied for subsequent comparative analyses.

The results of the comparison of cadres' knowledge before and after the training intervention are presented in Table 5.

Table 5 Comparison of cadres' knowledge before and after training (n=25)

Variabel	Mean	Min-Max	ΔMean	Z -value	Std . Deviation	p-value
Knowledge	Pretest	48.00	35-80	46.00	-4.388	10.000-4.546
	Posttest	94.00	80-100			0.000*

*Wilcoxon: negative range = 0; positive range = 25; ties = 0

Table 5 presents the comparison of cadres' knowledge before and after training. The mean posttest score (94.00) was significantly higher than the pretest score (48.00), with a mean difference of 46.00 ($p < 0.05$).

The results of the comparison of cadres' skills in providing health education before and after training are presented in Table 6.

Table 6 Comparison of cadres' skills before and after training (n=25)

Variabel	Mean	Min-Max	ΔMean	Z -value	Std . Deviation	p-value
Cadres' Skills	Pretest	37.20	25-55	50.00	-4.425	6.627-5.965
	Posttest	87.20	75-95			0.000*

*Wilcoxon: negative range = 0; positive range = 25; ties = 0

Table 6 shows the comparison of cadres' skills before and after training. The mean posttest score (87.20) was significantly higher than the pretest score (37.20), with a mean difference of 50.00 ($p < 0.05$)

4. Discussion

This study demonstrated that health education provided to community health workers (cadres) using video and module-based media improved their knowledge and skills in delivering health education to the community, particularly to women of reproductive age. The primary purpose of implementing health education and training activities was to provide cadres with a comprehensive understanding of cervical cancer, including its definition, causes, signs and symptoms, complications, preventive measures, screening, and early detection. In addition, the training also focused on technical counseling skills such as communication techniques, responding to questions, discussion methods, planning, and the effective use of educational media. Once equipped with these competencies, cadres are better prepared to provide effective health education to the community, especially to women.

Several studies have emphasized the importance of structured health education and training using appropriate media. Evidence suggests that such interventions can significantly improve knowledge, motivation, awareness, and participation in cervical cancer prevention efforts. This improvement is largely attributable to the delivery of valid and interactive information during training sessions (Sen & Gencturk, 2025; Zhang et al., 2019). Health education and training programs encourage women to undergo Pap smear examinations and to utilize health facilities for the prevention and treatment of cervical cancer. Furthermore, community awareness regarding screening practices has been shown to increase following health education interventions (Thompson et al., 2017).

The educational media developed and tested in this study included both modules and educational videos. The module served as a valuable tool to support cervical cancer prevention and early detection. As an educational resource, the module offered several advantages, such as providing comprehensive information on cervical cancer and its prevention. Its portability allowed participants to review the content as needed, reinforcing their knowledge when forgotten. According to Choi et al., (2020), modules are an essential component of health information dissemination. Effective health education through such materials enhances health literacy and strengthens community confidence in cervical cancer prevention and the importance of screening. To be effective, modules must also take into account the characteristics of the target population and be culturally relevant. Research by Mhalungekar et al., (2025), demonstrated that instructional modules were effective in improving knowledge and attitudes toward cervical cancer prevention. Their pretest results showed that 23% of respondents held negative attitudes and 74% held positive attitudes; following the intervention, 94% reported positive attitudes and only 6% negative. In terms of knowledge, 55% of respondents initially scored below average, but post-intervention results indicated no respondents scored below average, with 75% scoring at average and 25% above average.

Health education using modules also has the potential to correct misconceptions and reduce negative stigma within the community. Modules can present extensive information supplemented with visuals, narratives, or testimonials from individuals with personal experiences, as well as real-life case examples. Choi et al., (2020), confirmed the effectiveness of modules in dispelling misunderstandings about cervical cancer. Their qualitative study evaluated the effectiveness of health education interventions that provided information on cervical cancer, encouraged HPV screening, and delivered prevention-focused messages. Although the intervention lasted only 10 minutes and was conducted by healthcare providers, including nurses, it was considered effective based on qualitative feedback from participants. The findings highlighted improvements in knowledge and reductions in stigma and misconceptions after reviewing the module.

This study also employed animated video as an additional educational medium. Animated video was chosen due to technological advancements that make it easily accessible on personal devices at any time. The video contained information about the definition of cervical cancer, signs and symptoms, risk factors, complications, preventive measures, and early detection. It also included motivational messages encouraging visual inspection with acetic acid (VIA) screening and cervical cancer prevention. The inclusion of visual animations accompanied by audio and text was intended to enhance participant engagement and comprehension. This aligns with Setiyawati et al., (2022), who emphasized that video is a form of audiovisual health education media that effectively conveys information by combining visual and auditory features. Such audiovisual approaches are often more appealing and easier for participants to understand (Alamsyah et al., 2020).

Videos also provide the advantage of repeatability, allowing participants to revisit the material to reinforce memory and comprehension. As noted by Oktavianto et al., (2025) and Salsabila et al., (2025), video-based education is both engaging and informative, while also offering the flexibility to be replayed when needed. Unlike single-session information delivery, which may be quickly forgotten, video allows for repeated exposure, thus improving retention and understanding, particularly regarding cervical cancer prevention. Video-based education has also been shown to influence behavioral change toward healthier practices. Ampofo et al. (2020), reported that video interventions increased knowledge and awareness of cervical cancer risk factors, while Pertiwi et al. (2020), found that video-based health education improved adolescents' knowledge and attitudes regarding cervical cancer prevention.

Furthermore, video media has been found to be more effective than traditional leaflets. Herlinadiyaningsih & Syaripahnoor (2020), demonstrated that video interventions were superior in enhancing knowledge, attitudes, awareness, and preventive behaviors related to cervical cancer compared to leaflets. One notable advantage of animated videos disseminated via social media is their ability to rapidly and broadly increase public knowledge about cervical cancer and its prevention. Community responses have been overwhelmingly positive, with 95.4% of women rating such videos as informative, easy to understand, engaging, and satisfactory. Participants also reported feeling inspired to take preventive measures and undergo early detection (Sen & Gencturk, 2025).

Other studies support the effectiveness of videos in increasing women's willingness to undergo screening. Drokow et al., (2021), reported that the proportion of respondents willing to undergo VIA increased from 47.5% to 81.7% following a video-based intervention. Their study also concluded that video-based education influenced perception, improved self-confidence, and enhanced understanding of cervical cancer screening and HPV vaccination. Video interventions can prevent negative health attitudes and behaviors, and although they contribute to long-term improvements in health-seeking behaviors, they must be tailored to specific demographic groups to achieve maximum impact. Moreover, videos serve as effective tools for healthcare providers to deliver counseling and education to both patients and the wider community (Austin et al., 2021; Li et al., 2020).

This study demonstrates that multimedia-based health education, combining validated modules and animated videos, effectively enhances community health workers' knowledge and counseling skills in cervical cancer prevention. By empowering frontline health workers, the intervention improves their ability to engage and educate women of reproductive age, fostering early detection and preventive behaviors. These findings highlight the potential of scalable, culturally appropriate, and evidence-based educational tools to strengthen community-level cervical cancer prevention programs in low- and middle-income settings.

This study has several methodological limitations that should be considered when interpreting the findings. First, the relatively small sample size may limit the generalizability of the results to broader populations of cadres or community settings. Second, the short interval between the pretest and posttest assessments may have influenced the observed improvements in knowledge, as immediate post-intervention gains may reflect short-term recall rather than sustained learning. Third, this study did not analyze potential confounding variables, such as participants' prior training experience, educational background, or length of service as cadres, which may have affected both knowledge and skill outcomes. Consequently, the findings should be interpreted with caution, and future studies are recommended to employ larger samples, longer follow-up periods, and more comprehensive analytical approaches to better assess the long-term effectiveness of the intervention.

5. Conclusion

Health education using module and video media was proven effective in improving the knowledge and skills of community health cadres in delivering health education for cervical cancer prevention, particularly among women of reproductive age. The module as a printed medium provides advantages in presenting information that can be repeatedly accessed, while the animated video offers interactive visual and audio features that enhance understanding. The combination of these two media can serve as a feasible educational strategy to strengthen the role of health cadres in cervical cancer prevention and early detection programs. Health cadres are encouraged to continuously utilize educational modules and videos as tools for routine counseling, particularly on cervical cancer prevention and early detection. It is recommended to conduct studies with stronger experimental designs and larger sample sizes, as well as to assess the long-term impact of module and video-based interventions on cervical cancer prevention behaviors in the community.

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