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Health Education Interventions to Improve Cervical Cancer Screening Behavior: A Scoping Review

Firda Dwi Anugrah[1*], Ditya Yankusuma Setiani[2], Durrotul Qomariyah[3], Siti Romlah[4], Eka Suryaning Tyas[5]
[1,4,5] School of Nursing, Bhakti Al-Qodiri College of Health Sciences
[2] Panti Kosala College of Health Sciences
[3] Dharma Praja Bondowoso Midwifery Academy
**Corresponding author: pipir798@gmail.com*

ABSTRACT

Background: Cervical cancer is one of the most common cancers and the fourth leading cause of death among women worldwide. Several factors influencing cervical cancer screening behavior include knowledge and attitudes toward screening, relationships between patients and health care providers, and fear of test results.

Purpose: This study aimed to identify the provision of health interventions in improving cervical cancer screening behavior.

Methods: The method used in this study was a scoping review of 11 selected articles. The findings showed that six articles reported health education using audio visual media, which significantly increased cervical cancer screening behavior. Three articles examined the use of social media, although one study found that social media did not significantly improve screening behavior. In addition, three articles used conventional educational methods and demonstrated significant improvements in cervical cancer screening behavior.

Results: Overall, the review indicates that increasing knowledge is a key factor in encouraging women to participate in cervical cancer screening.

Conclusion: Adequate understanding can improve awareness, willingness, and ability to undergo screening. Future studies are recommended to compare the effectiveness of various health education media to support their implementation in health services. Nurses, as educators and counselors, have an important role in providing sufficient information and influencing the community regarding the importance of cervical cancer screening.

Keywords: Cancer, Cervical, Education, Intervention, Screening

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BACKGROUND

Cervical cancer is the most common cancer and is the fourth cause of death among women in the world (Meshack, 2022). Estimated 604,000 new cases and 342,000 deaths in 2020. The majority (90%) of these cases occurred in Low and Middle Income Countries, Sub-Saharan African countries have the highest regional burden of incidence and mortality rates (WHO, 2021 ; Sung et al., 2021) (WHO, 2021). Even though cervical cancer is a malignant disease that has a vaccine to prevent it, this cancer is still the main cause of death from cancer compared to other types of cancer (Sung, 2021).

Poor access to prevention, screening and treatment leads to delayed presentation, which in turn leads to poor treatment outcomes, low survival rates and high mortality rates from cervical cancer in Africa. According to the World Health Organization (WHO), and several cancer survival studies and clinical registries, developed countries with well-regulated cervical cancer programs have achieved significant reductions in cervical cancer incidence and mortality, but developing countries with vaccine coverage low levels and the lack of an organized cervical cancer screening program have not achieved this reduction (Makadzange, 2022). Knowledge and attitudes towards cervical cancer screening, patient – health care provider relationship, and fear of test results are some of the factors reported to influence cervical cancer screening (Meshack, 2022). Several recent studies show that women's low knowledge and awareness about cervical cancer is something that contributes to low levels of cervical cancer screening (Makadzange, 2022). As in previous research, it was found that almost three quarters (72.1 %) had insufficient knowledge about the signs and symptoms of cervical cancer (Meshack, 2022).

Health education is an activity to provide or increase public knowledge in maintaining and improving health. The basic concept of education is a learning process. Through health education, a person becomes knowledgeable, aware, able and willing to overcome health problems. (Beale, 2017).

Health education is a dynamic process of behavior change, meaning that this change occurs with awareness from within the individual or society itself. Health education is a term applied to the planned use of educational processes to achieve health goals (Snelling, 2014). Health education is a component of health programs and medical programs that are planned to improve behavior, individuals, groups and communities by carrying out promotive and preventive efforts without ignoring curative and rehabilitative efforts.(Edelman, 2018)
Based on Gejir and Agung (2017), health education media is essentially an educational aid used by educators in delivering educational/teaching materials (Gejir, 2017). Media is an intermediary that transmits information between sources and recipients. Messages, ideas, notions or information conveyed by teachers or speakers will be easily accepted if they are given using correct and good methods and media.

Several studies have shown that by providing interventions in the form of health education there is an increase in cervical cancer screening which is beneficial for cancer prevention efforts. A comprehensive approach to the prevention and control of cervical cancer including health education interventions is needed. A review of evidence-based interventions can guide policymakers to optimize cervical cancer prevention. Therefore, the aim of this article is to review the literature and identify potentially effective health education interventions to increase knowledge, awareness, and use of cervical cancer screening and vaccination (Makadzange, 2022).

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OBJECTIVE

The aim of this research is to identify the provision of health interventions in increasing screening behavior for cervical cancer.

METHODS

This article is a *scooping review* . Searching for articles in this *scooping review* uses the PICO model to make it easier for writers to identify keywords in finding articles that match the research topic.

Table 1. PICO (Population, Intervention, Comparison, Outcome)

Elements	Key Words
P (Problem)	Cervical Cancer
I(Indicators/Intervention)	Health Education, Intervention of Health Education, Health Education Intervention
C (Comparation)	-
O (Outcome)	Screening Behavior

The literature search in this research used databases including Cambridge, Wiley, Proquest, and Sciencedirect. Search using the keywords *"Cervical Cancer* ", " *Cervical Cancer Screening", "Knowledge of Cervical Cancer" "Health Education for Screening in Cervical Cancer"* with Boolean search methods such as "AND," "OR," and "NOT" to make it easier for authors to find articles that are relevant and appropriate to the study material.

This scooping review is limited by several inclusion criteria, namely articles that discuss providing interventions in the form of health education that can increase screening behavior for cervical cancer. Articles that are original research with quantitative methods. Articles were published in the database between 2018 and 2024. Researchers ensure that articles are available in full text and use English from reputable journals and are indexed by Scopus. This article was reviewed based on published articles so no ethical tests were carried out.

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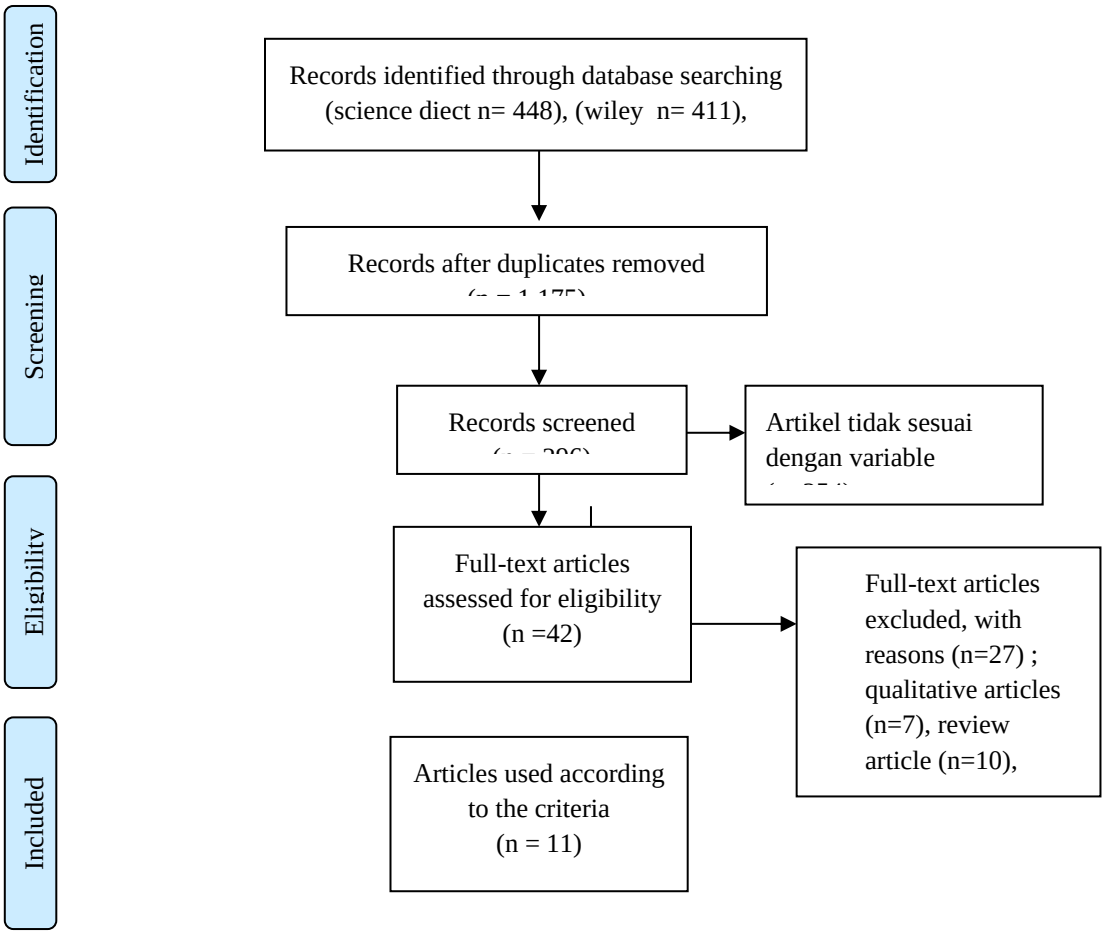

Picture. 1 PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)

RESULTS

Table 1. Review Articles

No	Author / Year	Location	Aims	Population/Sample	Method	Results
1.	Haeok Lee, et al. (2024)	Malawi, East Africa	To develop and evaluate a mHealth delivered, theory-guided, and culturally adapted storytelling intervention (STN) to increase cervical cancer screening among the	The sample consisted of 3 groups, namely group 1 which was given video-based intervention (mHealth) with STN (n=60) ;\ Group 2: mHealth with non-narrative videos Group 3: control group who only read non-narrative educational	Quasi Experiment	Both groups 1 and 2 had almost twice the VIA uptake rate as group 3 (51.0 % and 50% vs. 35.0%, p= 0.01) at 2 month follow-up but there was no difference between groups from

			Malawian community	material directly (n=60)		follow-up. continue 2 to 6 months. All groups showed significant increases in knowledge about risk factors, intentions and uptake of VIA.
2.	Matthew Asare (2024)	Ghana, West Africa	effectiveness of behavioral interventions in promoting cervical cancer screening in women living with HIV (WLWH) in Ghana	74 samples divided into 37 in each group	Pragmatic two-group blinded controlled trial (RCT) design single and two groups..	The intervention group had a screening rate of 100%, and the control group had a screening rate of 14.63%
3.	Susan Folsom (2023)	Colposcopy Clinic, New York	Testing interventions to assess feasibility, acceptability, knowledge, and follow-up of abnormal Paps	Sample: 84 Respondents	Quasi Experimen t	There was an increase in knowledge scores after providing intervention in the form of education via the web, namely the Patient Activated Learning System (PALS). The most significant increase was seen in questions about HPV risk factors (P b 0.001) and management of abnormal Pap (P b 0.01) .
4.	F. Zheng , K. Wang (2023)	United States of America	determine possible ways to encourage appropriate screening	Sample : 911 respondents	Cross-sectional	Factors influencing high-frequency screening and guideline-

			with guidelines and reduce health disparities			compliant screening differ. Just efficacy (odds ratio [OR] ¼ 1.16; 95% confidence interval [CI] ¼ 0.98, 1.37) which had a significant positive relationship with high frequency screening behavior. Social media engagement (OR ¼ 0.57; 95% CI ¼ 0.33, 0.96) was shown to have impact on guideline-concordant screening.
5.	Thahirabanuibrahim (2021)	Chengalpattu district	To compare changes in knowledge and attitudes, percentage of screening rates, after health education interventions	Sample; 370 women	Quasi experiment	Significant differences were found on factors, warning signs (p-value = 0.03; MD = 7.59; CI = 3.27–3.29), Risk factors (p-value = 0.02; MD = 21.32; CI = 21 .2 –21.4) and attitudes towards screening (p-value = 0.003; MD = 0.85; CI = 0.79–0.81). Screening rate percentage was 31.1% after health education.

6.	Emma C. Cooper (2020)	Ilemela District, Mwanza Region, Tanzania from 2 July 2018 to 6 July 2018	To determine whether a 10-minute instructional video-based intervention can improve basic knowledge about human papillomavirus infection and specific sequelae of cervical cancer	Female Population 18 years old in the region Sample: 764 women	Quasi experiment	Post-video scores increased significantly significant regardless of age group, clinic location, primary language, level of education, literacy, or access to service providers health (P<0.0001). Score changes after watching the video live significantly greater in participants from urban areas (1,992.07) compared to participants from rural areas (1,071.95) (P<.0001).
7	Tanzania (2019)	Tanzania	to compare effectiveness SMS messages (short message service) communicatio n behavior change (BCC) and BCC SMS messages delivered with an electronic voucher transportation (eVoucher) in increasing usage CCS versus control group	The target population of this study includes women aged between 25 and 49 year olds who have access to mobile phones live in the coverage area of the Mawenzi Regional Referral Hospital and Meru Regional Hospital. The sample was 866 which was divided into 3 groups	Quasi experiment	Group participants interventionist s were more likely to attend than participants control group

8	Nancy Innocentia Ebu (2019)	Ghana, West Africa	To determine the effect of health education interventions on cervical cancer and perceptions screening of women in the Komenda, Edina, Eguafo and Abirem (KEEA) Districts of the Central Region of Ghana	Sample: the sample required for this research is 394 people divided into an intervention group and a control group	Quasi Experiment	Comparison of differences in mean pre-Comparison of the difference in mean pre-post-test scores of the intervention and control groups showed statistically significant differences for knowledge about cervical cancer (t = 6.22, df = 780, p = 0.001), knowledge about cervical cancer screening (t = 5.96, df = 780, p = 0.001), perceived seriousness (t = 3.36, df = 780, p = 0.001), perceived benefits (t = 9.19, df = 780, p = 0.001), and perceived barriers (t = 3.19, df = 780, p = 0.001). However, the perception of vulnerability in the intervention group was reduced, as evidenced by a decrease in the mean (mean = ÿ0.12) compared to the control group (mean = 0.93) and this was statistically

						significant (t = 2.72, df = 780, p = 0.007)
9	A. Lidofsky (2018)	Tanzania	To determine the effectiveness of health education sensitive education programs to culture using evidence-based methods	Sample: 200 women	Quasi experiment	Maasai participants showed a significantly greater increase in knowledge (21 .4 %, p < 0.001) after the educational sessions, compared to women and non-Maasai health workers. Non-Maasai women also showed moderate to significant progress.
10	Anayawa Nyambe (2018)	Lusaka	To find out to what extent the film is effective in disseminating information about cervical cancer and its prevention to women and men in Lusaka.	Sample: 83 divided into control group and intervention group	Quasi experiment	Short information films can be an effective means of disseminating information about cervical cancer and its prevention to women and men
11	Chinyere Mbachu (2018)	Nigeria	To assess the effectiveness of peer health education on perceptions, willingness to screen and use of screening cervical cancer by women	Sample; 300 samples	Quasi experiment	Statistically significant differences were observed in participants' individual risk perceptions for cervical cancer and perceived benefits of early detection through screening. Cervical cancer screening practices increased by

	6.8% and the observed difference was statistically significant (p = 0.02) . This is significantly related to marital status, education level, employment status and parity (p <0.05) .

DISCUSSION

Interpretation of the findings

The increasing incidence of cervical cancer in low- and middle-income countries, accompanied by low screening rates, has prompted the development of various educational interventions to improve women's knowledge and awareness of cervical cancer. The findings of the studies discussed in this section indicate that educational interventions, whether delivered through audio-visual media, social media, or conventional methods, generally have a positive effect on cervical cancer screening-related outcomes. This suggests that improving women's access to information is an important strategy to address low screening participation. The rationale for such interventions is consistent with available literature indicating that lack of knowledge or awareness is one of the common barriers to cervical cancer screening in low- and middle-income countries (Lott, 2020). Health education can be delivered through electronic media, print media, or billboards (Notoadmodjo, 2014).

Research conducted by Anita Kulkarnia using web media, namely PALS (Patient Activated Learning System), found that the post-intervention knowledge score was higher than the initial score. This study suggests that enjoyable health education can reduce anxiety and increase knowledge about cervical cancer across demographic and socio-economic groups. These free and widely viewed videos can reach diverse populations and improve colposcopy knowledge and follow-up, with the goal of reducing cervical cancer disparities (Kulkarnia, 2023). The results of the research conducted by Lee (2024) also found that the sample in the study was glued to the tablet screen and actively involved in watching the video and observing how the data collector marked the answers on the tablet. The collector stated that the stories were particularly enlightening because the storyteller was a Malawian. The results of this research are also supported by research conducted by Nyambe (2018), which showed that short information films can be an effective means of disseminating information about cervical cancer and its prevention to women and men. An intervention study in Nigeria found that the level of awareness of cervical cancer and screening increased to 100%, and the proportion of women with very good knowledge rose from 2 to 70.5% following structured health education based on films.

The same research using video media showed that short video-based educational interventions increased basic knowledge about the consequences of human papillomavirus

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infection in the population studied (Cooper, 2020). Researchers believe that videos can increase public awareness because they provide confidence that the information conveyed is true. Other research also conveys the same result, namely that after health education using audio-visual media, cervical cancer screening rates increased from 6.2% to 31.1% (Thahirabanuibrahim, 2021). Research conducted by Ganeshkumar (2022) in India through a multicentric survey across 69 centers in 14 states also showed that after audio-visual training using a standardized video developed in regional languages, the proportion of women who showed willingness to undergo periodic cervical cancer screening reached 84.4%, with significant improvement in knowledge scores across all demographic groups ($p < 0.05$).

Not all of the six studies above directly measured screening behavior as their primary outcome, as some studies such as Kulkarnia (2023) and Cooper (2020) focused on improvements in knowledge and awareness, while others such as Thahirabanuibrahim (2021) and Ganeshkumar (2022) reported a more direct effect on screening intention and participation. Nevertheless, audio-visual media consistently demonstrated a positive effect on the key determinants of screening behavior across all six studies. This finding indicates that audio-visual media can function not only as an educational tool but also as a behavioral stimulus that increases women's readiness to participate in screening. The influence can be explained through the Health Belief Model, in which audio-visual media acts as a cue to action that increases perceived susceptibility and perceived severity of cervical cancer, reduces perceived barriers by familiarizing viewers with the screening process, and strengthens self-efficacy. Social Cognitive Theory further supports this by explaining that observational learning through video, particularly when the role model shares the same cultural background as the viewer, effectively promotes behavior change by enhancing both knowledge and self-efficacy toward cervical cancer screening.

Similar research using social media methods in the form of WhatsApp by sending voice messages modified with the 3 R model (Reframing, Reprioritizing, and Reforming) showed that the intervention group had a screening rate of 100%, while the control group had a screening rate of 14.63% (Asare, 2024). Another study also used social media in the form of modified SMS, and it was found that intervention group participants were more present than control group participants during cervical cancer screening examinations (Erwin, 2019). Different research results were obtained by Zheng (2023), namely that women with a tertiary education level were less likely to undergo examinations in accordance with guidelines but were more likely to have high-frequency cervical cancer screening compared to women with secondary school education.

This study confirms the impact of social media on women's cancer screening behavior; however, it also found that online health information seeking and social media participation negatively impacted guideline-concordant screening, which is contrary to previous research. This can stem from factors such as information overload and the digital divide, leading to inaccuracies in online information that adversely impact filtering habits. The concept of the digital divide is often interpreted as the gap between people who have access to information and communication technology and those who are not able to access it. However, although computers and the internet are very easy to use, not everyone will take full advantage of the opportunities these technologies provide. It is difficult for people to identify the information they really need and use it effectively, thereby contributing to the emergence of an empowerment gap.

Of the three studies above, not all of them showed a uniformly positive effect on screening behavior. Asare (2024) and Erwin (2019) demonstrated that social media interventions directly increased screening participation, while Zheng (2023) found that social media use could

paradoxically reduce guideline-concordant screening behavior, particularly among more educated women. This suggests that the effect of social media on screening behavior is not absolute and is heavily influenced by the quality, clarity, and cultural relevance of the information delivered. Theoretically, the influence of social media on screening behavior can be explained through Social Cognitive Theory, in which repeated exposure to health messages via familiar platforms such as WhatsApp and SMS reinforces self-efficacy and outcome expectations by providing accessible role models and social reinforcement. The Theory of Planned Behavior also supports this, as social media shapes subjective norms by creating a perception that screening is an accepted and expected behavior within one's social environment, which in turn strengthens the intention to act. However, as shown by Zheng (2023), when information is excessive or poorly filtered, it can disrupt the decision-making process and undermine the positive behavioral intentions that social media otherwise promotes.

Similar research also found that health education can increase cervical cancer screening rates; the difference is that this research still uses conventional methods (Ebu, 2019). This is also in line with the results of research using conventional methods carried out by peers, which are considered effective in increasing women's perceptions of the benefits of early detection of cervical cancer through screening. It is also effective for improving cervical cancer screening practices (Mbachu, 2018). Different research carried out by Lidofsky (2019) provided health education conventionally using a cultural approach. Through culturally sensitive and accessible patient education programs, Maasai women gained knowledge about cervical cancer screening and treatment.

All three studies above demonstrated a positive effect on cervical cancer screening behavior, although through different mechanisms and target outcomes. Ebu (2019) and Mbachu (2018) showed direct improvements in screening rates and practices, while Lidofsky (2019) focused on knowledge and cultural acceptability as the pathway through which conventional education influences screening behavior. This indicates that conventional interventions remain effective across diverse populations, particularly when the approach is tailored to the social and cultural context of the target group. Theoretically, this influence can be explained through the Health Belief Model, in which face-to-face conventional education directly addresses perceived susceptibility and perceived severity by delivering personalized information, while simultaneously reducing perceived barriers through interpersonal reassurance and trust between the educator and the participant. Social Cognitive Theory further supports this by explaining that peer-led conventional interventions, as demonstrated by Mbachu (2018), are particularly effective because observational learning and social reinforcement from trusted peers within the same community strengthen self-efficacy and normalize screening as an expected health behavior.

Comparison with previous studies

When compared with previous studies, the findings of the present discussion are generally consistent with the broader literature that identifies educational interventions as effective tools for increasing cervical cancer screening awareness, intention, and participation. The audio-visual interventions discussed above align with previous evidence showing that accessible and engaging educational materials can improve women's knowledge and screening-related behavior. Studies using web media, short films, and standardized videos, such as those conducted by Kulkarnia (2023), Lee (2024), Nyambe (2018), Cooper (2020), Thahirabanuibrahim (2021), and Ganeshkumar (2022), all support the view that visual and interactive learning materials are effective in improving knowledge and motivating women to undergo screening. These results are

also in line with the general understanding that repeated exposure to health messages can strengthen awareness and readiness for action.

The findings related to social media also resemble previous studies showing that digital platforms can increase screening participation. Asare (2024) and Erwin (2019) support this conclusion by showing better screening outcomes in the intervention groups. However, Zheng (2023) presents a different pattern, since online health information seeking and social media participation were associated with lower guideline-concordant screening. This contrast suggests that previous findings are not entirely uniform and that digital interventions may be beneficial only when the information is accurate, accessible, and easy to interpret. In other words, the current discussion is consistent with earlier studies in showing that social media can influence screening behavior, but it also highlights that the direction of that influence may depend on the quality of the message and the user's ability to process it appropriately.

The conventional education studies also compare favorably with previous research. Ebu (2019), Mbachu (2018), and Lidofsky (2019) support the argument that face-to-face or culturally adapted health education remains relevant and effective in promoting screening behavior. These findings are particularly important because they show that even without digital or audio-visual tools, conventional methods can still generate meaningful behavioral change when delivered in a culturally appropriate way. Therefore, the present findings are in line with previous literature, but they also broaden the understanding that the effectiveness of education is not determined solely by the medium used; rather, it is influenced by content relevance, cultural fit, and the way the intervention is delivered.

Possible explanations for differences

The differences observed across the studies can be explained by several factors. First, not all studies measured the same outcomes. Some studies focused on knowledge and awareness, while others assessed screening intention, attendance, or actual screening behavior. This variation in outcome measurement may explain why the effects of the interventions appear stronger in some studies than in others. For example, Kulkarnia (2023) and Cooper (2020) mainly assessed changes in knowledge, whereas Thahirabanuibrahim (2021), Ganeshkumar (2022), Asare (2024), and Erwin (2019) reported more direct behavioral effects.

Second, the intervention media differed in accessibility, presentation style, and user engagement. Audio-visual media may be more effective because it combines narration, images, and demonstration, which make the material easier to understand and remember. Social media interventions may produce different results depending on whether the content is delivered in a structured and culturally appropriate way. The study by Zheng (2023) suggests that when users are exposed to excessive or confusing online information, the intended behavioral effect may weaken or even become negative. This may be related to information overload, the digital divide, or limited skill in evaluating online health information.

Third, participant characteristics also likely contributed to the differences. Educational level, digital literacy, cultural background, and prior knowledge may shape how women respond to health education. The fact that Lee (2024) found strong engagement partly because the storyteller shared a similar cultural background supports the idea that familiarity and cultural relevance improve acceptance. Likewise, Ganeshkumar (2022) used regional languages, which may have increased comprehension and willingness to screen. In conventional interventions, the trust built through direct interaction may also explain why culturally sensitive education was effective in Ebu (2019), Mbachu (2018), and Lidofsky (2019). Thus, differences across studies

may reflect not only the intervention type but also the fit between the intervention and the target population.

Implications for nursing practice

These findings have important implications for nursing practice, particularly in health promotion and cervical cancer prevention. Nurses play a central role in educating women, correcting misconceptions, and encouraging participation in screening programs. The evidence suggests that nurses can use audio-visual media, social media, and conventional counseling as complementary approaches to increase awareness and screening uptake. Because each method has its own strengths, nurses should select educational strategies based on the characteristics of the target population, including age, literacy, digital access, and cultural background.

In practice, audio-visual education can be used in clinics, community health centers, and outreach programs to provide clear and engaging information about cervical cancer and screening procedures. Social media platforms such as WhatsApp or SMS can be used to provide reminders, reinforce health messages, and maintain contact with women who may otherwise not return for screening. At the same time, conventional face-to-face education remains essential, especially for populations with limited digital access or strong preferences for interpersonal communication. The findings also suggest that culturally sensitive education is particularly effective, so nurses should adapt language, examples, and teaching methods to the community they serve.

Overall, nurses should not rely on a single method of education. Instead, they should combine appropriate media, accurate content, and culturally relevant communication to strengthen women's knowledge, perceived benefits, and willingness to undergo cervical cancer screening. By doing so, nursing practice can contribute more effectively to early detection efforts and ultimately help reduce the burden of cervical cancer.

CONCLUSION

Based on the results of the journal review, it was found that the majority of journals stated that health education could increase screening behavior for breast cancer. The most basic thing in efforts to improve screening behavior for cervical cancer is the existence of knowledge about this matter, by knowing that someone will be aware, able and willing to do it. Nursing implications: Nurses as educators and counselors can provide sufficient information so that they can influence the community on the importance of screening for cervical cancer.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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