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Scoping review of interventions to increase VIA test uptake in Indonesia

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Abstract

Purpose: Cervical cancer remains a major public health concern in Indonesia. Although the VIA (Visual Inspection with Acetic Acid) screening program has been introduced, the national target of 75% coverage has not yet been achieved. Enhancing public participation requires more effective health promotion strategies. This study reviews public health intervention studies conducted in Indonesia aimed at increasing VIA screening uptake. **Methods:** Literature published between 2015 and 2025 in English and Indonesian was searched using PubMed and Google Scholar. Inclusion criteria focused on peer-reviewed intervention studies with transparent methodologies and outcome assessments related to VIA uptake. Qualitative studies and other types of studies not published in peer-reviewed journals were excluded from the analysis. Data were extracted and synthesized narratively based on target intervention and outcomes. **Results:** From 114 retrieved articles, 22 studies met the inclusion criteria. All were cross-sectional studies conducted across 12 Indonesian provinces, primarily in Java and Sumatera. Sample sizes ranged from 12 to 121 participants, totaling 1,278 individuals. Most studies targeted women (n = 19), while a few involved local women cadres (n = 2) or both (n = 1). Knowledge (n = 14) and attitude (n = 11) were the most frequently measured outcomes. All interventions (n = 22) reported positive results. **Conclusion:** These findings highlight a critical gap in health intervention strategies targeting women's social support, especially husbands. Further research should design intervention research focusing on male partners and employ longitudinal designs to assess the long-term impact of these strategies on VIA test uptake.

Keywords: gynaecologic cancer; health promotion; visual inspection with acetic acid

INTRODUCTION

At the global level, cervical cancer remains one of the most common malignancies. In 2020, there were an estimated 604,127 new cases and 341,831 deaths, with disproportionately higher incidence rates observed in low- and middle-income countries (LMICs). In the context of Indonesia, it is reported the highest cervical cancer incidence in Asia, at 24.4 cases per 100,000 women-years [1].

The observed rise in cervical cancer incidence in Indonesia may reflect improved case detection following the introduction of the National Health Insurance Scheme or *Jaminan Kesehatan Nasional* (JKN) in 2014, which expanded access to diagnosis and treatment [2].

Cervical cancer screening plays a significant role to reduce mortality, with up to 83% of cervical cancer deaths potentially preventable through regular screening [3]. In addition, the World Health Organization (WHO) has urged countries to pursue the 90-70-90 targets—90% of girls fully vaccinated against HPV by age 15, 70% of women screened for cervical cancer by age 35, and 90% of women with cervical disease receiving appropriate treatment—with the goal of eliminating cervical cancer as a public health problem by 2030 [4]. In low resource settings, the Visual Inspection with Acetic Acid (VIA) test is widely recognized as a feasible and cost-effective alternative for cervical cancer screening. The VIA test involves applying a 3–5% acetic acid solution to the squamocolumnar junction (SCJ) of the cervix using a cotton swab, followed by a one-minute wait to observe any acetowhite changes indicative of a pre-cancer or cancer lesion, as observed by a trained healthcare worker [5]. Its relatively high sensitivity, ease of implementation, and minimal infrastructure requirements make it a practical option for expanding screening coverage where access to cytology-based methods is limited [6,7].

In Indonesia, however, cervical cancer screening rate remains far below the target. The Indonesian Ministry of Health has introduced the National Action Plan (NAP) for Cervical Cancer Elimination (2023–2030), which includes a target of achieving 75% cervical cancer screening coverage among women aged 30–69 years in 2030 [8]. As of 2020, coverage stood at just 9.3% of the target population, with significant disparities between provinces. Although the VIA test is a free cervical cancer screening service available at primary healthcare facilities in Indonesia, public awareness remains extremely low. A survey conducted in six major cities revealed that only 1% of respondents were familiar with the VIA test, indicating a significant gap in public knowledge and the effectiveness of outreach efforts [9].

Barriers to the low uptake of cervical cancer screening are multifaceted and can be categorized into demand-side and supply-side factors. Demand-side barriers include a lack of knowledge, fear, logistical challenges, and limited spousal support. On the supply side, challenges include a shortage of trained personnel, insufficient resources, and inadequate promotional efforts [10]. This situation calls for efforts and effective strategies to improve cervical cancer uptake in Indonesia. Evidence from a global scoping review suggests that strategy involving community health workers or one-on-one patient interactions demonstrated the largest effect sizes in improving screening uptake; however, the review did not include studies on interventions conducted in Indonesia [11].

Therefore, this study aims to identify interventions in Indonesia that focus on strategies to improve the uptake of the VIA test. This focus is chosen because the VIA test is widely available across the country and is offered free of charge by the government when conducted at primary health centers. Although several interventions to increase VIA uptake have been developed and implemented in Indonesia, these vary in terms of geographic location, cultural context, sample size, and the media or strategies used. The findings from this review can guide the development of more effective, large-scale interventions that are tailored to the needs of Indonesian women, with the ultimate goal of reducing cervical cancer incidence.

METHODS

A scoping review was conducted to identify and synthesize literature on interventions aimed at increasing the uptake of the VIA test for cervical cancer screening in Indonesia. The database search was conducted in April-May 2025 using PubMed and Google Scholar. All literature published between 2015 and 2025 was covered, and grey literature was included if applicable. The selection of the study period ensures that all included studies were conducted after the implementation of the JKN scheme. The articles searched were in both English and Indonesian.

For PubMed, the search strategy combined keywords related to cervical cancer, screening methods, interventions, and geographic relevance. The following search term combinations were used [[Cervical cancer] OR [Cervical cancer screening] OR [Visual Inspection with Acetic Acid] OR [VIA test]] AND [[Intervention] OR [program] OR [strategy] OR [approach]] AND [[Indonesia*] OR [Southeast Asia] OR [ASEAN] AND [[healthcare] OR [public health] OR [screening uptake] OR [awareness]] AND [[prevention] OR [detection] OR [diagnosis] OR [treatment]]. For Indonesian-language literature accessed through Google Scholar, the search terms included: “tes IVA” and “deteksi dini kanker serviks” or translated as VIA test and cervical cancer early detection.

The studies were included in this scoping review if they met the following criteria: (1) Peer-reviewed articles indexed in Scopus for English language articles or SINTA (Science and Technology Index) for Indonesian articles; (2) Intervention studies aimed at increasing VIA test uptake and/or improving factors related to the test (e.g., knowledge, attitudes, motivation, or intention); (3) Articles with full-text availability; and (4)Studies with clearly defined

research methodologies and statistical analyses that assess the effect size or impact of the intervention. Studies were excluded if they met any of the following criteria: (1) Qualitative studies; (2) Editorials, commentaries, reviews or conference abstract without original research; and (3) Theses or dissertations not published in peer-reviewed journals. The flow chart detailing the study selection process is presented in Figure 1.

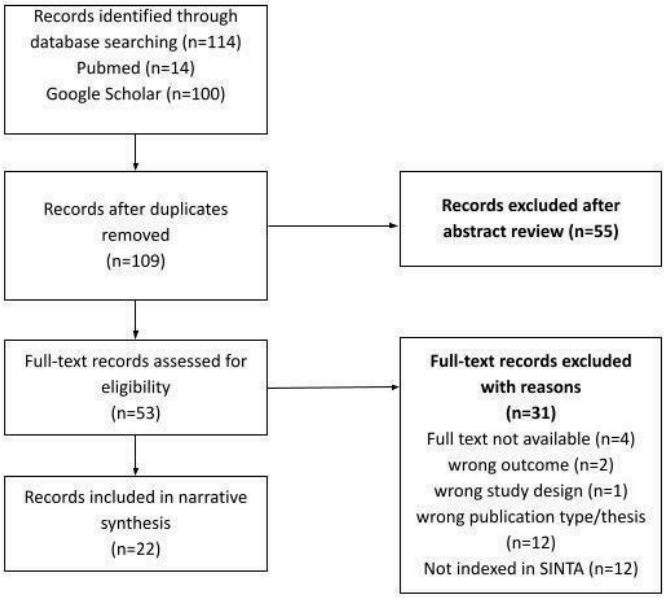

Figure 1. Flow chart of article selection and screening process for scoping review of interventions to increase VIA test uptake in Indonesia

Retrieved articles were entered into Rayyan software to facilitate the screening process and identify duplicates, which were subsequently removed. Two independent reviewers (AR and BDP) reviewed the titles and abstracts using predetermined eligibility criteria. Articles that met the inclusion requirements were reviewed in full text. Discrepancies or disagreements that arose throughout the selection process were resolved through discussions.

Data extraction was independently performed by two reviewers (AR and BDP) using a predefined format prepared in Microsoft Excel. Extracted information was summarized narratively and included the name of the first author, publication year, intervention location, strategy and media, intervention description and outcomes. Discrepancies during data extraction were resolved through discussions to ensure accuracy. This scoping review does not require ethical approval.

RESULTS

A comprehensive database search yielded a total of 114 articles. After removing 5 duplicates, 109 articles remained to be screened based on title and abstract. 55 items were now eliminated due to their failure to meet the inclusion criteria. Of the remaining 53 papers, 31 were removed for a variety of reasons, including a lack of access to the full-text article (n = 4), an irrelevant outcome (n = 2), an inadequate study design (n = 1), the improper publishing type (n = 12), and not being indexed in Scopus or Sinta (n = 12). Finally, 22 articles were considered in the final review as described in Table 1.

Table 1. Description of included studies (n = 22)

Characteristics of research	n	References
Population sample sizes		
0 - 49	14	(13–24)
50 - 99	6	(25–29)
> 99	2	(30,31)
Population sample		
WRA	19	(13–17,19–21,23–29,31–34)
Cadre	2	(18,30)
WRA & Cadre	1	(22)
Provinces		
Bali	2	(32,34)
Banten	1	(19)
Bengkulu	4	(21,24–26)
Central Java	4	(16,18,29,31)
Lampung	1	(20)
North Kalimantan	1	(33)
North Sumatra	2	(17,27)
Riau	1	(15)
South Sulawesi	1	(28)
West Java	2	(13,23)
West Kalimantan	1	(14)
West Sumatra	2	(22,30)
Time frame of publication		
2015 - 2019	6	(13,26–28,31,34)
2020 - 2025	16	(14–25,29,30,32,33)
Type of component*		
Health education	9	(14,19,20,22,27,28,30,31,33)
Printed / AV media	11	(13,15,17,23–26,29–32)
Others	5	(16,18,21,33,34)

*studies counted more than once per category;
WRA: women of reproductive age

This scoping review included 22 primary studies conducted across Indonesia. All articles are in Bahasa Indonesia, with sample sizes ranging from 12 to 121 participants, yielding a total of 1,278 participants. Studies were spread across 12 provinces out of the 38 provinces in Indonesia specifically Bali (n = 2), Banten (n = 1), Bengkulu (n = 4), Central Java (n = 4), Lampung (n = 1), North Kalimantan (n = 1), North Sumatera (n = 2), Riau (n = 1), South Sulawesi (n = 1), West Java (n = 2), West Kalimantan (n = 1), and West Sumatra (n = 2).

These findings indicate that most studies were carried out on the islands of Java and Sumatera—Indonesia's relatively economically developed regions [12]. Unfortunately, no studies included in this review were conducted in the eastern part of the country.

All studies employed a cross-sectional research design. Half of the articles (n = 11) were studies using control groups, and the remaining half were one-group interventions using pre- and post-test evaluation. Two articles focused on intervention targeting local cadres, 19 articles focused on women residing within the study area, and one article combined both local cadres and women. Most of the studies also involved local Primary Health Centers (PHCs) to recruit participants (n = 14), while others were community-based interventions with a scope ranging from as small as the village to higher regional levels, such as sub-districts or kecamatan. Details of the interventions are described in Table 2.

Table 2. Intervention description and outcome(s) for each study

First author (year)	Intervention description	Outcome(s)
Alamsyah (2020) [13]	Audiovisual Media	Increased knowledge, attitude, and practice of VIA test
Andriani (2019) [14]	Movie in local language	Increased knowledge and motivation to VIA test
Aribowo (2019) [15]	Comparing two groups, receiving audio visual and visual media respectively	Both interventions increased knowledge of VIA test
Daulay (2019) [16]	Community education	Increased knowledge and attitude of VIA test
Hutagalung (2023) [17]	Video animation	Increased intention to screen VIA test
Idhayanti (2024) [18]	Health education through one-on-one assistance (3 visits)	Increased knowledge and practice of VIA test
Maretta (2022) [19]	Community education and video	Increased knowledge and attitude of cadre
Nurbaiti (2020) [20]	Cadre training for IVA socialization	Increased knowledge, attitude, and practice of VIA test of women cadre
Nurnilawati (2020) [21]	Comparing two groups receiving audiovisual (film) and visual education (leaflet/flip chart)	Increased attitude to VIA test
Pratiwi (2024) [22]	Two community education sessions in one day	Increased knowledge and attitude to VIA test
Pratiwi (2024) [23]	45 minutes of community education session using flash card	Increased motivation for VIA test
Purwaningsih (2021) [24]	Health education	Increased attitude to IVA test
Puspita (2017) [25]	Comparing two groups, receiving community education or leaflet respectively	Both interventions increased practice of VIA test
Putri (2020) [26]	Community education	Increased motivation of VIA test
Rahayu (2020) [27]	Wish and drive method (combining education, counseling and family support)	Increased knowledge, attitude, and intention to screen VIA test
Safaringga (2024) [28]	Community education and educational media	Increased knowledge and intention to screen VIA test of women and cadre
Solikhah (2023) [29]	Homevisit	Increased practice of VIA test
Sophia (2022) [30]	Video based education	Increased knowledge and attitude to VIA test
Sudarwaty (2018) [31]	Health education	Increased knowledge, attitude, and practice of VIA test
Sulastri (2023) [32]	Booklet and card	Increased knowledge of VIa test
Trisnowati (2020) [33]	Booklets	Increased knowledge of VIA test
Yanti (2018) [34]	Three sessions with peer educator	Increased intention to screen VIA test

Regarding the interventions, half of the included studies utilized media support, either audiovisual, printed materials, or a combination of both (n = 11). Audiovisual media, such as short films, were the most commonly used (n = 7), including one intervention that utilized a film in the local language. Other studies used printed media such as leaflets (n = 2), booklets (n = 2), and flashcards (n = 1). Health education, either as a standalone intervention or supported by media, was conducted in nearly half of the studies (n = 10), with most involving community education sessions (penyuluhan). Other methods (n = 5) included participant assistance, cadre training, home visits, the 'wish and drive' approach, and peer education.

Most of these studies (n = 13) measured knowledge as an outcome, followed by attitude (n = 9), practice (n = 6), intention (n = 4), motivation (n = 3), and cadre capacity (n = 3). It is important to note that a single study may measure more than one outcome. All interventions (n = 22) resulted in positive outcomes.

DISCUSSION

Target intervention

According to the WHO, women of reproductive age are 15–49 years old [35]. However, most studies target women in their mid-20s to early 40s—an age group more likely to be married. The VIA procedure, which requires speculum use to visualize the cervix, is relatively invasive [36]. Although all sexually active women of reproductive age should access VIA screening, Indonesian cultural norms often limit it to married women.

Health cadres—community volunteers who support primary health center (PHC) activities—play a central role in promoting VIA screening [37]. Female cadres educate their peers, encourage attendance at outreach events, and sometimes arrange transport. They also act as role models, and their reluctance to seek post-test treatment may discourage others from doing the same [38]. This influence is likely due to shared social identity and familiarity between cadres and other women [39].

While cadre knowledge and attitudes toward VIA are critical, their ability to provide counseling and emotional support is equally important [10]. However, most studies focused only on increasing knowledge, with limited efforts to strengthen these additional support skills.

Another key factor is the husband's role. In Indonesia, where spousal permission is often required for medical procedures, the husband's attitude can greatly affect a woman's decision to undergo VIA screening [10,40–42]. Spousal support also enhances women's self-efficacy, increasing their likelihood of participating in screening [43]. Thus, interventions targeting male partners or improving their knowledge and attitudes should be considered.

Outcomes

Most interventions aimed to increase women's knowledge about the VIA test and cervical cancer. This is justified, as knowledge is a key predisposing factor influencing health behaviors [44]. In Indonesia, knowledge has the strongest influence on women's participation in VIA screening [42]. A lack of understanding of cervical cancer causes, risk factors, symptoms, and screening procedures contributes to low uptake [45]. According to the Health Belief Model, knowledge affects perceived severity and benefits, which are linked to greater screening intent [46,47]. Yet, evidence shows knowledge about VIA in Indonesia remains low [38,48], highlighting the need for continued education efforts.

All interventions reviewed showed improvement in attitude and practice outcomes. This is consistent with previous findings that positive attitudes toward VIA significantly correlate with both one-time and repeated screening practices [42]. Conversely, negative attitudes contribute to low screening participation [49].

Currently, review papers on VIA interventions focus primarily on global settings, excluding research from Indonesia. This study addresses that gap by synthesizing local evidence—especially critical as Indonesia has yet to meet its national screening target, despite recommendations to achieve 75% coverage by 2030. This scoping review can inform the development of more culturally and contextually tailored intervention strategies.

This review is limited by the nature of included studies, which are mostly cross-sectional, with little to no follow-up to assess whether gains in knowledge or attitude translate into actual VIA uptake. Moreover, most articles lacked detailed information on intervention components—such as educational materials, media used, or implementation protocols. This lack of transparency makes it difficult to assess the quality, consistency, or scalability of interventions and hinders meaningful comparisons across studies.

CONCLUSION

This scoping review provides a comprehensive summary of the existing evidence on health intervention strategies to promote VIA test use. Even though there is already a vast amount of research on interventions targeting women, and a few research targeting the cadre, there is still a research gap regarding the involvement of women's social support, particularly from male partners. Social support around women has been proven in several studies as a facilitator of VIA test uptake.

According to the findings, there are several health intervention techniques aimed at boosting knowledge, attitude, and practice of cervical screening detection. While all of the included studies suggest favorable improvements following intervention, more research is needed to evaluate whether the observed changes have a long-term impact. The utilization of longitudinal research to examine the effect of health intervention measures may provide more solid evidence for initiatives to improve VIA test use in Indonesia.

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