

# Visual inspection with acetic acid screening use determinants: a systematic literature review

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## Abstract

**Purpose:** In Indonesia, in 2022, of 36,964 cervical cancer cases, 56% ended in death due to cervical cancer. Cervical cancer can be identified at an early stage through routine examinations, allowing for more effective treatment and increasing the chances of cure. The visual inspection of acetic acid (VIA) screening has emerged as a simple, effective, and affordable option.

**Methods:** The research method uses a systematic literature review, carried out using primary studies from PubMed, Proquest, and Google Scholar using the keywords "woman; VIA; preventing cervical cancer" published between 2019 and 2024, full text and open access articles and according to the topic.

**Results:** 25,999 research articles were screened for eligibility, and 10 met the inclusion criteria. The coverage of the VIA screening was due to age, social norms, opinions, behavior of other people, the availability of health facilities, support from husbands, support from health workers, and economic conditions. **Conclusion:** Educational interventions at the community and health facilities are needed to increase VIA examination coverage. Socialization and education involving women and men are expected to help increase public participation in VIA examinations and reduce morbidity and mortality due to cervical cancer.

**Keywords:** cervical cancer; screening; visual inspection with acetic-acid

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## INTRODUCTION

Cervical cancer, a prevalent disease among women globally, particularly in developing countries, poses a significant health challenge to our society. The urgency of addressing this issue is underscored by its high incidence rates.

The latest data from The World Health Organization (WHO) said that the cancer cervix occupies position number four and frequently occurs in women

worldwide, with 604,000 cases of new deaths and 342,000 deaths in 2020 [1]. Furthermore, in Indonesia, in 2022, there were 36,964 cervical cancer cases with 20,708 deaths, which means more than 56% of cases of cancer cervix ended in death cases [2].

The main cause of cervical cancer is persistent infection by Human Papillomavirus (HPV). Cervical cancer can be identified at an early stage through routine examinations, thus allowing more effective treatment and increasing the chances of recovery. As

well as height prevalence, human papillomavirus (HPV) and HIV infections are added to the scarcity of screening programs, and Cancer cervix is a very important issue [3].

More of the 85% of women who died because of cancer in the cervix live in multiple low-income countries, low and middle-class (LMIC) [4]. There are various testing methods for detecting early cancer cervix. However, VIA is proven to be one of the simplest, most effective, and most affordable methods.

Visual Inspection with Acetic Acid (VIA) is frequently used in screening or detecting early cervical cancer [5]. VIA involves the use of acetate to identify change cells in the neck and possibly uterus that become signs of lesion pre-cancerous or cervical cancer [6].

No VIA examination needs expensive equipment or a complicated laboratory. With sour acetate, officer health can easily identify and change suspicious cells, possibly detecting early and action-appropriate seven precautions [7].

Although the importance of the VIA examination has been acknowledged, its scope still needs to improve in some areas. The explanation says that several factors influence public participation in the inspection. These social determinants are important in determining whether someone will follow the VIA examination.

From 2020 to 2022, there was an increase in the incidence of cervical cancer by 331 cases. Previous studies have identified the benefits of VIA screening. Previous research found that knowledge level, attitudes, economy, and husband support influence VIA screeningport. Very few studies discuss how to increase the coverage of VIA screening to reduce the incidence of cervical cancer.

Therefore, to fill the above gap, this study examines the determinants affecting the coverage of VIA. Based on the findings of our systematic literature review, we have formulated intervention recommendations that have the potential to significantly increase the coverage of VIA screening. These evidence-based recommendations can serve as a robust foundation for the development of more effective health policies and programs, thereby making a substantial contribution to public health.

Understanding the determinants affecting VIA screening coverage is a crucial first step in designing effective intervention strategies. By identifying community participation factors, we can develop strategic steps to overcome existing obstacles and encourage greater participation in VIA examinations.

This underscores the importance of community involvement in reducing overall morbidity and mortality from cervical cancer and improving women's health and well-being.

## METHODS

This research uses literature methods reviews, which consist of three steps: 1) search strategy, 2) selection criteria, and 3) data extraction and quality assessment.

Step 1: Search strategy. This systematic review was written based on the Preferred guidelines Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to report events evaluated based on healthcare interventions and behaviors. Questions regarding population, intervention, control, and outcomes (PICO) used in the systematic review are P (population): Woman, I (intervention): VIA, C (comparison/control): -, O (Outcome): Preventing Cervical Cancer. The articles used were taken from online databases PubMed and ProQuest (enter via remote access to the University of Indonesia library). Google Scholar uses the same keywords: Woman, VIA, and Preventing Cervical Cancer.

Step 2: Selection criteria: Identify relevant articles using inclusion and exclusion criteria. Inclusion criteria articles are published in 2019-2024 and can be accessed in full/open access/full text and research articles. Meanwhile, the exclusion criteria are qualitative articles, dissertation articles, reports, opinions, literature reviews, articles whose topic does not match the purpose of the review, and articles that are not full text.

Step 3: Data extraction and quality assessment. The article using PRISMA-SR 2020 was chosen as a reference for this literature review study because it has a complete and detailed checklist [17].

## RESULTS

After a literature search from the PubMed, ProQuest, and Google Scholar databases, these were filtered again according to predetermined inclusion criteria; ten articles were found suitable for further review. The stages of search results and article selection are displayed using the PRISMA diagram in **Figure 1**.

Of the ten selected articles, six were conducted in Indonesia, one in India, one in northern Tanzania, one in southern Ethiopia, and one in Kampala, Uganda. All articles used quantitative research methods.

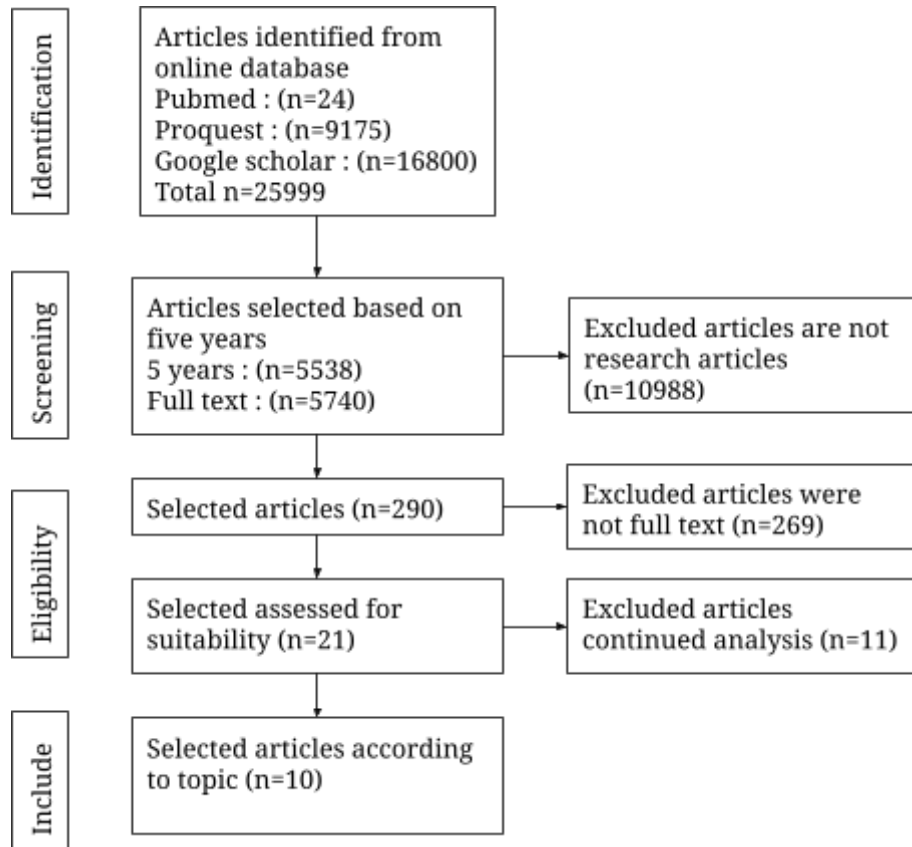


Figure 1. PRISMA diagram of the search process article

Cancer cervix is caused by the Human Papillomavirus (HPV) Infection; the incidence of cancer cervix is increasing all over the world. Natural history development disease ranges between 10 to 20 years. Therefore, effective screening can help detect early and prevent fatal complications. There are several methods of prevention and treatment of cancer cervix. However, the VIA examination is more accurate in diagnosis than the Pap smear cytology inspection. VIA testing can be applied as a tool for screening the main thing that can be done. Lesion praema line and malignant often occur in women who continue living in a low social status economy. Therefore, women in this group must be effectively reachable and protected through targeted screening programs [8].

Other risks have been identified related to low scope VIA examination, including the habit of smoking, increased amount of children ever birth (parity), social status economy low, and turnover partner sexual. There is a connection between norm

subjective and belief self in the implementation of screening detection early cancer cervix with the IVA technique, which can influence the behavior of a mother for screening detection cancer cervix early [9].

**Subjective norms factor**

Research conducted against 60 female respondents in the Puskesmas of Rejosari area found that most respondents' norms are subjective. This matter is the study. Another study also found the trend respondents' own characteristics norm subjective medium and high [10]. The study also found that most respondents trust high self and norms highly subjective, showing a trend for following the behavior and opinions of others. There is a connection between norm subjective with certainty of detection of early cancer cervix use of VIA technique in women of childbearing age [9,10]. It is recommended that information be utilized to influence the behavior of Mothers in detecting early cancer cervix.

**Table 1. Summary article selected**

Author, Location	Title	Method	Sample	Results
A1 [3], Tanzania	Performance of HPV testing, Pap smear, and VIA in women attending cervical cancer screening in Kilimanjaro region, Northern Tanzania: a cross-sectional study nested in a cohort	Quantitative, Cross-Sectional	Sample of 1620 responden	Of the 1620 women enrolled, 229 (14.1%) were HPV positive, and 222 of them underwent advanced inspection, together with 290 (20.8%) women with negative HPV tests. In IVA, 17.6% were positive. On pap smear, 8.0% were classified as lesion intraepithelial squamous degrees tall.
A2 [4], Uganda	Visual inspection with acetic acid (VIA) positivity among female sex workers: a cross-sectional study highlighting one-year experiences in early detection of pre-cancerous and cancerous cervical lesions in Kampala, Uganda	Quantitative, Cross-Sectional	Sample 842 respondents	In customized analysis with age, more IVA positivity Possible occurred in women who reported having > 100 pairs lifetime alive ( aOR = 3.34, 95%CI: 1.38-8.12) and women with HIV positive ( aOR = 4.55; 95% CI: 2.12-9.84)
A3 [7], Indonesia	The Relationship between Mothers' Knowledge of Childbearing Age Couples and the Iva Test in the Padang Pasir Health Center Work Area	Quantitative, Descriptive Analytic	A sample of 82 respondents	The research results showed that 96.3% of respondents had good knowledge, and 91.5% had never taken an IVA test. There is no relationship between knowledge and progress in the IVA examination (p=1,000). This research concludes that no relationship was found between knowledge of mothers of childbearing age (PUS) and progress in the IVA examination.
A4 [8], India	A Comparative Analysis of Visual Inspection With Acetic Acid, Cervical Cytology, and Histopathology in the Screening and Early Detection of Premalignant and Malignant Lesions of the Cervix	Quantitative, Analysis Comparative	Sample of 500 respondents	Based on the results of the comparative analysis, sensitivity and specificity inspection of Pap Smear cytology were 89.5% and 65.2%, respectively. The sensitivity and specificity of IVA were found to be 94.7% and 88%, respectively. The accuracy of the IVA test _ overall (93.2%) is more significant than that of the Pap smear test (68%).
A5 [9], Indonesia	The Relationship between Subjective Norms and Confidence for Early Detection of Cervical Cancer with Visual Inspection Acetic Acid Technique	Quantitative, Descriptive Correlation	A sample of 60 respondents	38 respondents have norm subjective height with confidence high (63,3%), 2 Respondents have norm subjective low by confidence high (3.3%), and 20 Respondents have norm subjective low by trust self-low (33.3%). Result P-Value = 0,000. A relationship was found between standard subjectivity and certainty of location of early cancer cervix using the IVA Technique in women aged fertile.
A6 [11], Indonesia	Preventing Cervical Cancer by Increasing Coverage of Visual Inspection with Acetic acid and Cryotherapy in Public Health Centres	Quantitative Cross-Sectional	A sample of 45 respondents	Product in study: IVAIVA test and examination cryotherapy at the Community Health Center Wonoayu. The analysis shows a gap between exa expectations and perceptions of IVA patients against the product. It means services provided _ to IVA patients already by his hope.

A7 [12], Ethiopia	Visual inspection with acetic acid (VIA) service utilization and associated factors among women in Hawassa city, southern Ethiopia: a community-based cross-sectional study	Quantitative, Cross-Sectional	A sample of 49 respondents	Done against 411 women aged 30 to 49, with a level response of 98.1%. Service test sour visual acetate (IVA) was used by 85 women (20.7%). Analysis regression logistics Multivariate show that service-related VIA screening is significant with age more old and historical infection infectious sexual.
A8 [13], Indonesia	Factors Associated with Early Detection of Cervical Cancer with the IVA Method at the Padang City Health Center	Quantitative, Cross-Sectional	A sample of 110 respondents	In a study, 60% of respondents never underwent the IVA test. Statistical test results show that there is a significant relationship between level knowledge and IVA examination (p-value = 0.000), attitude and IVA examination (p-value = 0.041), access information and IVA examination (p-value = 0.000), support husband and VIA examination (p-value = 0.000), and IVA test results.
A9 [14], Indonesia	Factors Associated with Visual Inspection Coverage for Acetic Acid (IVA) in Kendari City	Quantitative Case-Control	A sample of 83 respondents	There is a relationship between the level of knowledge and low IVA examination in Kendari City. There is a connection between attitude and humility in the IVA examination in Kendari City. Supporting the husband in Kendari City is related to a low IVA examination. Supporting health workers are also in touch with low IVA examinations in Kendari City. Besides that, economic conditions are also related to the low IVA examination in Kendari City.
A10 [15], Indonesia	The Relationship between Understanding and Motivation of Women of Childbearing Age (WUS) with Acetic Acid (IvaVisual ) Inspection Examination in Sungai Tuan Ulu Village, Kab. Banjar in 2022	Quantitative, Analytical Correlation	A sample of 50 respondents	Spearman's analysis rho, with P value = 0.04 ( $\alpha = 0.05$ ), accepts the alternative hypothesis (HA). This research concludes a relationship between the motivation and understanding of women of childbearing age and the IVA examination.

### **Accessibility factor**

Some articles show that most patients have difficulty reaching the health center by public transportation, which affects the coverage of VIA examinations at the health center. Patients also find it difficult to understand promotions related to VIA. They consider the price to be unaffordable, the examination room to be messy, and the VIA process to be painful. Therefore, there is a need for education and health promotion regarding VIA examinations so that people are more confident in undergoing these examinations [10].

### **Sociodemographic factor**

Research conducted by Ganitet to evaluate the extent to which women in Hawassa City, Southern Ethiopia, use service visual inspection with sour acetate and related factors. The population study covers 411 residents of Hawassa between 30 and 49 years old [11]. Information about characteristic features sociodemographic, variables reproduction and behavior, the consciousness of cancer cervical and VIA screening, and practice VIA screening. Study This shows that the use of service-related VIA screening is significant with older age-old and historical infection infectious sexually transmitted infections (STIs) [12].

### **Husband support factors**

Other findings indicate that the scope of VIA examination was reported low. A connection between support husband and support officer health with low VIA has been identified. This matter is consistent with research on one community health center in Padang City, which shows that variable support husband is the most dominant variable with a p-value of 0.000 and Odds Ratio of 46.693 in influencing participation of women in the detection of early cancer through the VIA test. The results showed that respondents their husbands supported were 46 times taller. For VIA tests, they were compared with those who did not get support from their husbands. The study confirms that supporting the husband has proven its significant influence, whereas the respondent her husband supports tends more to do VIA examination [13].

### **Economic factor**

Economic conditions influence women of childbearing age to undergo VIA examinations because the costs incurred by WUS include not only the examinations but also transportation, parking, and food. The relationship between economic conditions and low levels of VIA examinations has been identified [13].

### **Knowledge factor**

Some findings show that intervention at educational and clinical levels in community and facilities health must be strengthened to increase knowledge of the risk of cancer cervix and push women to inspect the cancer

cervix at an approved site to increase utilization of service [12].

Other findings show that intervention education at the level of community and facilities health must be strengthened to increase knowledge of the risk of cancer cervix and push women to inspect the cancer cervix at an approved site to increase utilization of the service [14].

### **Motivation factor**

Furthermore, another finding states that understanding and motivating women's age fertility (WUS) is related to the VIA inspection [15]. Therefore, it is important to socialize about the IVA examination for women and men, including husbands, to increase women's motivation for the VIA test [15].

From a social perspective, many women have difficulty reaching health centers due to transportation constraints. The condition can reduce the scope of VIA examinations. It highlights the importance of increasing the accessibility of health services, especially for disadvantaged groups, because economic disadvantage can reduce participation in VIA screening. Therefore, subsidies or more affordable health service programs are needed to support low-income groups. Apart from that, education and promotion regarding IVA examinations are ineffective, causing many women not to understand the importance of early examinations. More comprehensive educational and promotional efforts are needed to increase awareness and participation. Education does not only target women but also involves husbands and the entire family to strengthen support for women's reproductive health so that it can increase motivation and participation in VIA examinations.

Understanding and addressing the determinants that influence VIA screening coverage is required. These findings guide the development of more effective health policies and programs. VIA screening has a significant impact on improving women's reproductive health, reducing death rates from cervical cancer, and improving the quality of life of society as a whole.

## **DISCUSSION**

The findings show that low-scope VIA is associated with some factors that influence it, such as age [12], existing norms in society [10], the opinions and behavior of other people, good family and environment, and facility and infrastructure facility health. Social factors such as husband's support, support from health workers, and economic conditions also influence VIA examination coverage [13].

Accessibility is one of the significant barriers to effective VIA examinations. Many women have difficulty reaching health centers due to transportation problems, reducing their participation in VIA screening programs [10]. There is a relationship between the accessibility of VIA examinations at the Benculuk Community Health Center. The lack of affordable health services and ineffective promotion of VIA exacerbates this problem. Many women do not receive adequate information about the importance of early screening, thus causing low participation rates in VIA examinations [16].

In addition, social factors, such as support from husbands and health workers, significantly impact the coverage of VIA examinations. Research conducted in Padang City shows that women who receive support from their husbands are 46 times more likely to undergo VIA examinations compared to those who do not receive support. Family involvement and support are crucial for increasing participation in cervical cancer screening [13]. These findings are consistent with previous research, which states that husband support influences how a person undergoes VIA examinations and the lack of interest among women of childbearing age in undergoing VIA examinations [18].

The lack of interest in VIA examinations is also associated with the low knowledge of women of childbearing age about VIA examinations and cervical cancer [12]. These results align with Notoatmodjo's theory (2012), which states that predisposing factors influencing a person's urge to carry out an examination include their knowledge level [19]. Knowledge impacts a person's behavior towards undergoing VIA examinations, and obtaining good knowledge is related to good education within the community [20].

Educational interventions at the community and health facility levels are needed to increase knowledge of cervical cancer risks and encourage women's participation age fertile in VIA examinations. No socialization and education involving only women and men, including husbands, is important to increase motivation and understanding of the importance of VIA examinations. Furthermore, educational interventions at both community and health facility levels are essential to increase awareness about the risks of cervical cancer and the importance of early detection through VIA. These findings provide valuable guidance for developing more effective health policies and programs by understanding and addressing the determinants affecting the coverage of VIA examinations. Such interventions can significantly improve women's reproductive health, reduce cervical cancer mortality rates, and enhance the overall quality of life in the community.

## CONCLUSION

The importance of early detection of cervical cancer through effective screening, which can prevent fatal complications as the disease progresses over 10 to 20 years. The VIA screening method is more accurate than a pap smear. It is highly effective for women with low socioeconomic status who are vulnerable to cervical cancer. Risk factors for cervical cancer include smoking habits, high parity, low socioeconomic status, and frequent changes in sexual partners.

Many patients face difficulties accessing public health centers and require better education and promotion related to VIA. Research in Hawassa, Ethiopia, shows that the use of VIA services is more common among older women and those with a history of sexually transmitted infections (STIs). Support from husbands, healthcare workers, and economic conditions also significantly increase women's participation in VIA screening.

The importance of educational and clinical interventions at the community level and health facilities to increase knowledge about the risks of cervical cancer and encourage women to undergo examinations at approved sites is emphasized. VIA examination socialization should include men, especially husbands, to increase women's motivation to undergo the VIA test.

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