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Cervical Cancer Awareness and Its Association with VIA (Visual Inspection with Acetic Acid) Screening Behaviors Among Women of Reproductive Age: A Cross-Sectional Study at Simpang Limun Primary Health Center

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ABSTRACT

Background: Cervical cancer is a malignant disease that affects the cervix and ranks as the fourth most common cause of cancer globally, according to the World Health Organization. Women over the age of 15 are at high risk, with the most affected age group being 25–64 years. Early detection through screening, such as visual examination tests, plays a crucial role in reducing cervical cancer morbidity and mortality. **Objectives:** This study aims to determine the relationship between the knowledge of women of childbearing age about cervical cancer and VIA tests, and their behavior (attitudes and actions) regarding VIA examination as a screening method for cervical cancer. **Methods:** This analytical descriptive study used a cross-sectional design. Data were collected through questionnaires distributed to women of childbearing age who visited the Simpang Limun Primary Health Center. The study population included women of childbearing age in the health center's working area. A total of 100 participants were selected using the one-population hypothesis sampling formula. Data were analyzed using the Chi-square test in SPSS. **Results:** The findings indicate a significant relationship between knowledge about cervical cancer and VIA tests and the behavior (attitudes and actions) of women of childbearing age towards undergoing VIA examinations. **Conclusion:** Enhancing knowledge about cervical cancer and tests can positively influence the behavior of women of childbearing age, leading to increased participation in cervical cancer screening.

Keyword: Cervical cancer, Screening, VIA test, Knowledge, Behavior

ABSTRAK

Latar Belakang: Kanker serviks merupakan penyakit ganas yang menyerang leher rahim dan menempati peringkat keempat sebagai penyebab kanker tersering di dunia menurut World Health Organization. Wanita berusia di atas 15 tahun berisiko tinggi, dengan kelompok usia yang paling banyak terkena adalah 25–64 tahun. Deteksi dini melalui skrining, seperti pemeriksaan IVA, berperan penting dalam menurunkan angka kesakitan dan kematian akibat kanker serviks. **Tujuan:** Penelitian ini bertujuan untuk mengetahui hubungan antara pengetahuan wanita usia subur tentang kanker serviks dan tes IVA dengan perilaku (sikap dan tindakan) mereka terhadap pemeriksaan IVA sebagai metode skrining untuk kanker serviks. **Metode:** Penelitian deskriptif analitik ini menggunakan desain *cross-sectional*. Data dikumpulkan melalui kuesioner yang dibagikan kepada wanita usia subur yang berkunjung ke Puskesmas Simpang Limun. Populasi penelitian mencakup wanita usia subur di wilayah kerja puskesmas tersebut. Sebanyak 100 partisipan dipilih menggunakan rumus *one-population hypothesis sampling formula*. Data dianalisis menggunakan uji *Chi-square* dengan bantuan program *SPSS*. **Hasil:** Hasil penelitian menunjukkan adanya hubungan yang signifikan antara pengetahuan tentang kanker serviks dan pemeriksaan IVA dengan perilaku (sikap dan tindakan) wanita usia subur terhadap pemeriksaan IVA. **Kesimpulan:**

Peningkatan pengetahuan tentang kanker serviks dan tes IVA dapat berpengaruh positif terhadap perilaku wanita usia subur, sehingga meningkatkan partisipasi dalam melakukan skrining kanker serviks.

Kata Kunci: Cervical cancer, Screening, VIA test, Pengetahuan, Sikap

1. Introduction

Cervical cancer is a malignant neoplasm originating from the epithelial cells of the cervix, which constitutes the lower third of the uterus. Anatomically, the cervix is cylindrical in shape and serves as the anatomical bridge between the uterine cavity and the vaginal canal, connected via the external uterine ostium. This anatomical position exposes the cervix to both external and internal carcinogenic factors, rendering it particularly susceptible to oncogenic transformation. Globally, cervical cancer continues to be a significant public health burden. According to the World Health Organization (WHO), it is currently ranked as the fourth most frequently diagnosed cancer and the fourth leading cause of cancer-related mortality among women worldwide. In 2020, there were an estimated 604,000 new cases of cervical cancer and approximately 342,000 deaths attributed to the disease, reflecting its substantial contribution to the global cancer burden, particularly in low- and middle-income countries where screening and vaccination programs remain limited or underutilized.[1] In Indonesia, cervical cancer represents a critical national health concern. Based on data from the Global Cancer Observatory (Globocan) in 2020, cervical cancer is the second most prevalent malignancy among women after breast cancer. That year, 36,633 new cases were documented, and cervical cancer was responsible for 21,003 deaths, highlighting significant gaps in early detection, public awareness, and access to appropriate treatment modalities.[2] Epidemiologically, women aged 15 years and older are considered at increased risk for developing cervical cancer, with the highest incidence observed in those between 25 and 64 years of age. This age group encompasses the majority of women in their reproductive years, who may also be socioeconomically active and bear important roles in their families and communities. [3]

Beyond its epidemiological impact, cervical cancer poses substantial challenges to women's physical, psychological, and social well-being. The disease often leads to considerable morbidity characterized by chronic pelvic pain, abnormal vaginal bleeding, and discomfort during intercourse. Moreover, the emotional and psychological burden, frequently manifesting as anxiety, fear of death, social stigma, and clinical depression, profoundly affects patients' quality of life and can complicate treatment adherence and recovery.[4] One of the most significant etiological factors contributing to the development of cervical cancer is persistent infection with the Human Papillomavirus (HPV). According to the WHO, approximately 95% of cervical cancer cases are attributable to HPV infection, making it the most common causative agent of this malignancy.[5] HPV is a non-enveloped, double-stranded DNA virus that primarily targets the basal epithelial cells of the anogenital region. Among the over 100 identified HPV genotypes, at least 14 are classified as high-risk types due to their oncogenic potential. Specifically, HPV types 16 and 18 are implicated in nearly 70% of all cervical cancer cases worldwide. These high-risk strains are associated with persistent infections that can result in high-grade cervical intraepithelial neoplasia (CIN 2/3), which, if left untreated, may progress to invasive carcinoma over several years. The progression from initial HPV infection to invasive cervical cancer is a multifactorial process influenced by host immune response, co-infections, sexual behavior, hormonal influences, and genetic predisposition.[6] Despite being preventable through effective vaccination, routine screening programs, and timely clinical intervention, cervical cancer continues to thrive in many settings where these preventive strategies are inadequately implemented or culturally stigmatized.

Visual Inspection with Acetic Acid (VIA) has emerged as one of the most widely implemented and accessible methods, particularly in low-resource settings. The VIA test involves the application of acetic acid to the cervix, which causes abnormal epithelial cells to turn white, allowing for visual identification of potential precancerous lesions. This technique is highly valued for its simplicity, affordability, and rapid results, making it an attractive option for widespread screening programs where more advanced cytological or molecular testing may not be feasible. Despite these advantages, awareness of the VIA test and participation rates among women of reproductive age remain suboptimal, thereby limiting the potential public health impact of this screening strategy. Several psychosocial and structural barriers contribute to this low uptake.[7] Among these, feelings of embarrassment and discomfort related to the intimate nature of the examination often deter women from seeking screening services. Additionally, the absence of overt symptoms in the early stages of cervical neoplasia fosters a false sense of security, leading many women to underestimate their vulnerability and delay

or forgo screening altogether. Moreover, there exists a pervasive perception among some populations that cervical cancer screening is unnecessary unless symptoms manifest, underscoring a critical gap in knowledge and health education.[7]

Knowledge, particularly cognitive awareness of cervical cancer and its preventability, plays a pivotal role in shaping women's attitudes and behaviors toward VIA screening. The acquisition of accurate information empowers women to recognize the importance of early detection and fosters proactive health-seeking behaviors. Cognitive awareness itself is influenced by a constellation of intrinsic and extrinsic factors. Intrinsic factors include demographic variables such as educational attainment and age, which often correlate with health literacy and receptiveness to health messages. Extrinsic factors encompass broader environmental and socio-cultural influences, including community norms, familial support, access to healthcare facilities, and parity, which may affect perceived risk and motVIAtion to undergo screening.[7] Furthermore, equitable access to reliable health information is essential for facilitating informed decision-making and enhancing participation rates in cervical cancer screening programs. This access is mediated by the availability of health education initiatives, mass media campaigns, community outreach, and healthcare provider communication. In the absence of adequate information dissemination, misconceptions and stigma may persist, further impeding screening uptake. Therefore, addressing these multifaceted determinants of knowledge and behavior is crucial for improving the effectiveness of VIA-based cervical cancer prevention strategies and ultimately reducing the disease burden among women of reproductive age.[7]

Therefore, the primary objective of this study was to comprehensively examine the extent to which the level of knowledge and awareness regarding cervical cancer influences the screening behaviors of women of reproductive age, with a particular focus on their participation in Visual Inspection with Acetic Acid (VIA) screening. This investigation was conducted within the context of the Simpang Limun Primary Health Center, aiming to elucidate the multifaceted relationship between cognitive understanding of cervical cancer risk factors, symptoms, and prevention methods, and the actual behavioral outcomes related to the acceptance and utilization of VIA as a cervical cancer early detection tool. By exploring these dynamics, the study seeks to contribute valuable insights into how educational and informational interventions may be optimized to enhance screening uptake, ultimately supporting efforts to reduce the burden of cervical cancer in this population.

2. Methods

Study Design

This study employed an analytical cross-sectional design, wherein the assessment of participants' knowledge, attitudes, and behaviors was conducted at a single point in time.

Population and Sample

The study population comprised women of reproductive age (25–50 years) attending the Simpang Limun Health Center. A total of 100 respondents were recruited using purposive sampling. Inclusion criteria were women aged 25–50 years, willing to complete the questionnaire and participate in the study and currently visiting the Simpang Limun Health Center. Exclusion criteria included individuals who were unmarried or unwilling to complete the questionnaire.

Data Measurement

Knowledge regarding cervical cancer and the Visual Inspection with Acetic Acid (VIA) screening method was evaluated using a structured questionnaire consisting of 25 items covering topics such as etiology, epidemiology, definitions, diagnostic procedures, prognosis, laboratory assessments, and treatment modalities. Attitudes and behaviors related to VIA screening were assessed using a separate questionnaire, comprising 10 items for attitude evaluation and 4 items for behavioral assessment. Responses were scored and categorized into three levels: adequate, moderate, and inadequate. The instruments used in this study had been previously validated and demonstrated acceptable reliability.

Statistical Analysis

Data analysis was performed using SPSS version 22.0 for Windows. Descriptive statistics were presented in tabular form. The Chi-square test was employed to examine associations between the independent and dependent variables, with a significance level set at *p < 0.05*.

Ethical Approval

The study protocol was reviewed and approved by the Research Ethics Committee of Universitas Sumatera Utara, Indonesia (Approval No: 358/KEPK/USU/2023). All participants provided informed consent prior to participation.

3. Result

Respondent Age Characteristics

The respondents in this study were women of childbearing age, ranging from 25 to 50 years, with a mean age of 36.2 ± 8.17 years. The most common age among respondents was 28 years, which falls within the peak reproductive period. The average age of 36 years suggests that the majority of participants were within an age group that actively engages with reproductive health services. Age is an important determinant of health status and can influence an individual's need for and utilization of healthcare services. This distribution reflects a representative sample of women in their reproductive years.

Table 1. Age Frequency Distribution of Women of Childbearing Age at Simpang Limun Health Center

Variable	Mean	Median	Mode	SD	Min-Mak
Age	36.2	34.5	28	8.17	25-50

As presented in Table 2, the majority of respondents had attained a senior high school education, with 59 out of 100 participants (59%) reporting this as their highest educational qualification. This indicates that a significant portion of the women of childbearing age at the Simpang Limun Health Center have completed secondary education, which may influence their health literacy and receptiveness to health promotion efforts. In terms of occupational status, 56 respondents (56%) identified as housewives. This suggests that over half of the participants are not engaged in formal employment outside the home, which may affect their availability for healthcare appointments and their access to health information. Regarding parity, the largest proportion of respondents (33%) had two children, reflecting a moderate family size typical of reproductive-aged women in Indonesia. Parity can be a factor influencing a woman's awareness and motivation toward cervical cancer screening practices such as the VIA examination. Additionally, when examining the occupations of the respondents' husbands, the most frequently reported job was construction work, cited by 41 respondents (41%). This may reflect the socioeconomic background of the sample, potentially influencing healthcare access and decision-making within the household. These sociodemographic factors, education level, occupational status, number of children, and spousal employment are important contextual variables that may impact knowledge, attitudes, and behaviors related to cervical cancer prevention and screening.

Table 2. Distribution of Respondents by Educational Attainment, Number of Children, and Occupation Among Women of Childbearing Age at Simpang Limun Health Center

Characteristic	Frequency(n)	Presentation(%)
Education		
Elementary School	2	2
Junior High School	4	4
Senior High School	59	59
Diploma (associate degree)	27	27
Bachelor's Degree	8	8
Occupation		
IRT	56	56
Employee	24	24
Self-employed	10	10
Nurse	8	8

Teacher	2	2
Number of Children	23	23
1 Children	17	17
2 Children	33	33
3 Children	20	20
4 Children	3	3
5 Children	1	1
6 Children	3	3
Husband's Job		
Employee	32	32
Teacher	3	3
Laborer	12	12
Craftsman	41	41
Driver	3	3
Self- employed	6	6
Labourer	3	3
Total Respondents	100	100.0

Distribution of Knowledge Levels Regarding Cervical Cancer and VIA Examination Among Women of Childbearing Age at Simpang Limun Health Center

The results of the analysis presented in Table 3 indicate that 19 respondents (19%) demonstrated good knowledge, 25 respondents (25%) had sufficient knowledge, and the majority 56 respondents (56%) exhibited poor knowledge regarding cervical cancer and the VIA (Visual Inspection with Acetic Acid) examination. These findings suggest that most women of childbearing age at the Simpang Limun Health Center possess inadequate knowledge about cervical cancer prevention and screening methods, highlighting the need for targeted health education interventions.

Table 3 Distribution of the frequency of knowledge of Women of Childbearing Age on cervical cancer and the VIA test at the Simpang Limun Health Center

Knowledge Level	Frequency(n)	Presentation (%)
Sufficient	19	19.0
Moderate	25	25.0
Insufficient	56	56.0
Total	100	100

Assessment of Attitudinal Disposition Toward Visual Inspection with Acetic Acid (VIA) Screening Among Women of Reproductive Age at Simpang Limun Health Center

The analysis presented in Table 4 shows that 20 respondents (20%) demonstrated a positive (good) attitude toward the VIA (Visual Inspection with Acetic Acid) examination, 52 respondents (52%) exhibited an adequate attitude, and 28 respondents (28%) showed a poor attitude. These results indicate that the majority of women of childbearing age at the Simpang Limun Health Center held an adequate attitude toward the VIA

examination, reflecting a moderate level of acceptance and awareness that could be improved with further health education and counseling initiatives.

Table 4 Frequency distribution of Women of Childbearing Age attitudes towards the VIA test at the Simpang Limun Health Center

Attitude	Frequency(n)	Presentation (%)
Sufficient	20	20.0
Moderate	52	52.0
Insufficient	28	28.0
Total	100	100

Evaluation of Behavioral Compliance Toward VIA Examination Among Women of Reproductive Age at Simpang Limun Health Center

The analysis in Table 5 reveals that 27 respondents (27%) demonstrated good compliance with VIA examination practices, 24 respondents (24%) exhibited moderate engagement, while the majority, 49 respondents (49%), showed poor adherence to recommended VIA examination behaviors. These findings indicate a need to enhance behavioral interventions to improve participation in cervical cancer screening among women of reproductive age at the Simpang Limun Health Center.

Table 5. Frequency Distribution of Behavioral Responses Toward VIA Examination Among Women of Childbearing Age at Simpang Limun Health Center

Behavior	Frequency(n)	Percentation (%)
Sufficient	27	27.0
Moderate	24	24.0
Insufficient	49	49.0
Total	100	100

Relationship Between Knowledge and Attitude Toward VIA Examination Among Women of Childbearing Age

The bivariate analysis using the Chi-square test, as shown in Table 6, yielded a p-value of 0.000 ($p < 0.05$), indicating that the null hypothesis (Ho) was rejected. This result demonstrates a statistically significant association between knowledge and attitude toward the VIA examination. The findings revealed that a majority of respondents (56%) possessed insufficient knowledge, and 49% exhibited a negative attitude toward the VIA test. Furthermore, respondents with inadequate knowledge predominantly displayed unfavorable attitudes toward the screening procedure. These results underscore the critical influence of knowledge on shaping attitudes regarding cervical cancer screening.

Table 6. Bivariate Analysis of the Relationship Between Knowledge and Attitude Toward VIA Examination Among Women of Childbearing Age

Knowledge	Attitude			Total	p value
	Insufficient	*Moderate*	*Sufficient*		
Insufficient	23	28	5	56	
Moderate	1	19	5	25	*0.000*
Sufficient	4	5	10	19	
Total	49	24	27	100	

Relationship Between Knowledge and Behavior Toward VIA Examination Among Women of Childbearing Age

The bivariate analysis using the Chi-square test, as presented in Table 7, yielded a p-value of 0.000 (p < 0.05), indicating rejection of the null hypothesis. This signifies a statistically significant relationship between knowledge and behavior regarding the VIA examination. The data showed that 56% of respondents had insufficient knowledge, while 49% exhibited inadequate behavior toward the VIA test. Moreover, respondents with low knowledge levels predominantly demonstrated poor behavioral practices related to the VIA screening. These findings highlight the importance of enhancing knowledge to improve health-related behaviors among women of reproductive age.

Table 7. Bivariate Analysis of the Relationship Between Knowledge and Behavior Toward VIA Examination Among Women of Childbearing Age

Knowledge	Behavior			Total	p value
	Insufficient	*Moderate*	*Sufficient*		
Insufficient	48	7	1	56	
Moderate	1	12	12	25	*0.000*
Sufficient	0	5	14	19	
Total	49	24	27	100	

4. Discussion

According to theoretical frameworks, age refers to the duration of an individual's life measured from birth and is a key factor influencing knowledge acquisition. This aligns with the World Health Organization (WHO) recommendation for early cervical cancer screening, particularly targeting women aged 25–50 years.[8] Educational background also plays a significant role in influencing health behavior. Research by Rahma and Prabandari showed that higher levels of education are associated with greater interest and willingness to undergo VIA (Visual Inspection with Acetic Acid) screening, while lower education levels are linked to decreased participation due to limited knowledge and decision-making capacity.[9] In this study, most respondents (56%) were housewives. Employment status can influence autonomy and access to health services, which in turn affects decision-making regarding health screenings. These findings are consistent with a study by Mirayasi in Pontianak, which reported that 37.5% of women interested in early cervical cancer detection were housewives.[10] Additionally, the study found that most respondents had two children (33%), consistent with findings by Nova Ari, who reported that women with two children were more likely to participate in VIA screening Theoretically, a higher number of childbirths increases the risk of HPV (Human Papillomavirus) infection due to repeated cervical trauma, which can predispose women to cervical cancer.[11] In conclusion, age, education, occupation, and parity are critical sociodemographic factors influencing women's knowledge, attitudes, and behaviors toward cervical cancer screening. These variables must be considered in public health strategies to improve VIA screening uptake.

Although an individual's understanding of a health issue forms the foundation for behavioral change, the desired action may not occur without adequate motivation to act upon that knowledge.[12] In this study, respondents with higher levels of knowledge regarding cervical cancer and VIA (Visual Inspection with Acetic Acid) examination were more likely to exhibit increased awareness and a proactive approach toward improving their health status by participating in screening. Conversely, those with limited knowledge were often unaware of the risks associated with cervical cancer and the importance of early detection, which served as a barrier to undergoing VIA screening. The low rate of VIA examination participation observed may also be influenced by insufficient health education initiatives at the Simpang Limun Health Center. A lack of structured counseling on VIA procedures and limited dissemination of information regarding cervical cancer risks may hinder public engagement in preventive services.

The findings of this study are consistent with those reported by Imma (2020), which indicated that the majority of respondents demonstrated an adequate or negative attitude toward VIA (Visual Inspection with Acetic Acid) screening.[13] Attitude is defined as an individual's favorable or unfavorable disposition toward a particular object or behavior. A negative attitude typically manifests as avoidance, dislike, or disapproval, whereas a positive attitude reflects acceptance and preference. In this context, respondents with a positive attitude were generally those who understood the importance and benefits of VIA screening. Conversely, negative attitudes were associated with a lack of understanding regarding the purpose and significance of the procedure. Attitudes are influenced by several factors, including personal experience, level of knowledge, and social influences, particularly from figures deemed important, such as healthcare providers. The prevalence of negative attitudes observed in this study may be attributed to the lack of health education provided by healthcare workers at the Simpang Limun Health Center. Many respondents reported that they had never received education or counseling regarding VIA screening, leading to insufficient information and thereby negatively affecting their attitudes. Knowledge plays a foundational role in shaping attitudes and, subsequently, behavior. According to health behavior theories, knowledge constitutes a critical domain in the development of attitudes and is directly linked to overt behavior. Individuals tend to develop attitudes that are congruent with their level of understanding, meaning that insufficient knowledge often correlates with negative perceptions and reduced health-seeking behavior.[12,13]

A considerable number of respondents exhibited negative attitudes towards the VIA (Visual Inspection with Acetic Acid) test, primarily because most reported that health workers had never provided adequate health education regarding the procedure. This lack of information likely influenced respondents' attitudes toward the VIA test negatively. Attitudes are strongly influenced by knowledge levels, as knowledge constitutes a fundamental domain in shaping both attitudes and overt behavior. Individuals tend to develop attitudes that align with their knowledge, often conforming to what they understand or believe to be true.[14] These findings are consistent with previous research which examined the relationship between knowledge and early detection behavior among couples of reproductive age. The study reported that most respondents did not undergo screening, indicating low participation in VIA examinations. The low participation rate among women of reproductive age may be attributed to inadequate counseling and limited awareness about cervical cancer and VIA screening. Furthermore, the absence of routine counseling and regular screening programs at local health centers likely contributes to insufficient knowledge and awareness regarding cervical cancer prevention.[15]These outcomes align with theoretical perspectives suggesting that individuals tend to develop attitudes consistent with their knowledge base. The availability of health facilities for early cervical cancer detection also plays a critical role. Although some health centers have implemented early detection programs using VIA tests, the promotion and accessibility of these programs remain limited, reducing community-wide awareness and participation. Attitudes are also influenced by the availability of health services and the behavior of healthcare providers. Supporting this, other studies have found a significant relationship between knowledge about cervical cancer and women's attitudes toward VIA testing. Individuals with knowledge about the disease's causes, symptoms, risk factors, transmission, and complications tend to have more positive attitudes toward early detection efforts, including VIA screening

In a study conducted by Kompang (2018), a correlation was found between women's knowledge about cervical cancer and participation in VIA screening. Among respondents, those with good knowledge were more likely to participate in screening compared to those with limited knowledge. However, some respondents with adequate knowledge still did not undergo the test, suggesting that knowledge alone does not guarantee action. MotVIAtion and support, particularly from healthcare workers such as midwives, are critical for encouraging knowledgeable women to participate in screening programs. This highlights that participation in VIA screening is influenced by multiple factors, including access to information, spousal support, and community

involvement.[16] Furthermore, a study by Change (2020) reported that among respondents with poor knowledge, the vast majority did not undergo VIA testing, while a smaller proportion of those with good knowledge also failed to participate. Statistical analysis confirmed a significant relationship between knowledge and participation in VIA screening. [17]

5. Conclusion

This study found that most women of childbearing age at Simpang Limun Health Center had completed high school, were housewives, had two children, and had spouses working in construction. The majority demonstrated insufficient knowledge (56%) about cervical cancer and VIA examination, with corresponding moderate attitudes (52%) and inadequate behaviors (49%) toward screening. Bivariate analysis revealed a significant relationship (*p = 0.000*) between knowledge and both attitudes and behaviors. These findings underscore the importance of improving health education to enhance knowledge, which can positively influence attitudes and encourage participation in cervical cancer screening.

6. Acknowledgments

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