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Knowledge and attitudes associated with visual inspection with acetic acid screening behaviour among women of reproductive age

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Abstract

Background: Cervical cancer remains a major preventable cause of morbidity and mortality among women. Participation in visual inspection with acetic acid (VIA) screening remains low in many primary-care settings.
Purpose: To examine the associations of knowledge and attitude with VIA screening behaviour among women of reproductive age.
Method: This analytical cross-sectional study included 85 women of reproductive age selected by purposive sampling in the service area of Dwikora Jaya Community Health Centre. Knowledge, attitude, and previous VIA screening were assessed by questionnaire. Fisher's exact test was used for the knowledge analysis and the Pearson chi-square test for the attitude analysis, with statistical significance set at $p < 0.05$.
Results: Adequate knowledge was reported by 62 women (72.9%), a favorable attitude by 45 women (52.9%), and 12 women (14.1%) had ever been screened with VIA. Knowledge was associated with VIA screening behaviour ($p = 0.031$); the prevalence of never being screened was 1.240 times higher among women with inadequate than adequate knowledge (95% CI, 1.098–1.401). A favorable attitude was associated with higher odds of previous VIA screening (OR = 5.429; 95% CI, 1.111–26.517; $p = 0.023$).
Conclusion: Knowledge and attitude were associated with VIA screening behaviour, but the cross-sectional design does not establish causality. The wide confidence interval for the attitude association indicates substantial uncertainty in its magnitude.

Keywords: Attitude; Cervical Cancer; Knowledge; Visual Inspection with Acetic Acid; Women of Reproductive Age.

INTRODUCTION

Cervical cancer is a major public-health problem and is largely caused by persistent infection with high-risk human papillomavirus (HPV). In 2022, an estimated 660,000 women were diagnosed with cervical cancer worldwide and about 350,000 died from the disease (Bray, Laversanne, Sung, Ferlay, Siegel, Soerjomataram, & Jemal, 2024; World Health Organization [WHO], 2024).

The burden is concentrated disproportionately in lower-resource settings, where access to screening and treatment remains limited (Arbyn, Weiderpass, Bruni, de Sanjosé, Saraiya, Ferlay, & Bray, 2020; Sung, Ferlay, Siegel, Laversanne, Soerjomataram, Jemal, & Bray, 2021). The WHO global elimination strategy identifies HPV vaccination, cervical screening, and treatment of precancer and invasive disease as complementary priorities (WHO, 2020).

Visual inspection with acetic acid (VIA; locally termed IVA) remains an accessible screening approach in many primary-care settings because the result is available immediately and the procedure requires limited equipment. Current WHO guidance prioritizes high-performance HPV testing where feasible, while VIA may still be used within appropriate screening and triage pathways (WHO, 2021). Indonesia also maintains national cervical-cancer management guidance and broader health-service programmes relevant to prevention and early detection (Ministry of Health of the Republic of Indonesia, 2018, 2024).

Screening uptake is influenced by knowledge, attitudes, perceived benefits and risks, social support, access, and perceived barriers. Indonesian studies have reported associations between knowledge, attitude, intention, and participation in VIA screening (Hanudji, Suparman, & Sondakh,

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2021; Nursanti & Ellina, 2022; Suhaid & Kusmiyanti, 2022; Hartati, Lathifah, Astriana, & Rachmawati, 2025). Community studies have also described relationships among knowledge, willingness, interest, and acceptance of VIA screening (Hassan, Armawan, & Arya, 2018; Komariyah, Rosidah, Sucipto, & Kristanto, 2023; Putri, Satyarsa, Wirahartato, Virayanti, Kenwa, Adiputra, & Sudarsa, 2018).

Despite the availability of VIA services, local evidence on behavioural factors associated with screening participation remained limited. This study therefore examined the associations of knowledge and attitude with VIA screening behaviour among women of reproductive age in the Dwikora Jaya Community Health Centre service area.

RESEARCH METHOD

This quantitative analytical study used a cross-sectional design and was conducted in the service area of the BLUD UPTD Dwikora Jaya Non-Inpatient Community Health Centre, Gunung Agung District, West Tulang Bawang Regency. The study population comprised women of reproductive age in the health-centre catchment area, and 85 respondents were recruited using purposive sampling. In this dataset, the operational age range represented under the study label "women of reproductive age" was 15–59 years.

Knowledge, attitude, and VIA screening behaviour were assessed using questionnaires. Screening behaviour was defined as whether the respondent had ever undergone VIA examination. The source manuscript did not report the data-collection period, numerical cutoffs used to define adequate/inadequate knowledge or favorable/unfavorable attitude, or questionnaire validity and reliability estimates; the categories are therefore reported as originally classified in the dataset.

Categorical data were summarized using frequencies and percentages. Fisher's exact test was used for the knowledge-by-screening table because one cell contained zero observations, while the Pearson chi-square test was used for the attitude analysis. A prevalence ratio (PR) for never being screened was reported for knowledge, and an odds ratio (OR) for ever being screened was reported for attitude, each with a 95% confidence interval. Statistical significance was set at $p < 0.05$.

RESEARCH RESULTS

Table 1. Participant characteristics (N = 85)

Variable	Results
Estimated age, years, mean ± SD	34.55 ± 8.73
Age (n/%)	
15–19 years	1/1.2
20–40 years	64/75.3
41–59 years	20/23.5
Employment status (n/%)	
Employed	50/58.8
Unemployed	35/41.2
Educational attainment (n/%)	
Primary school	19/22.4
Junior high school	33/38.8
Senior high school	33/38.8
Parity (n/%)	
>3	7/8.2
≤3	78/91.8

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As presented in Table 1, the estimated mean age was 34.55 ± 8.73 years, calculated from the midpoints of the reported age categories (15–19, 20–40, and 41–59 years). This is an approximation from grouped data and not a directly observed individual-level mean. Most respondents were aged 20–40 years (64 participants, 75.3%) and were employed (50 participants, 58.8%). Junior high school and senior high school were the most common educational levels (33 participants, 38.8% each), and 78 respondents (91.8%) had a parity of three or fewer.

Table 2. Distribution of knowledge, attitude, and VIA screening behaviour (N = 85)

Variable	Results
Knowledge (n/%)	
Adequate	62/72.9
Inadequate	23/27.1
Attitude toward VIA screening (n/%)	
Favorable	45/52.9
Unfavorable	40/47.1
VIA screening uptake (n/%)	
Ever screened	12/14.1
Never screened	73/85.9

As presented in Table 2, adequate knowledge was reported by 62 respondents (72.9%), a favorable attitude by 45 respondents (52.9%), and only 12 respondents (14.1%) had ever been screened with VIA.

Table 3. Association between knowledge and VIA screening behaviour (N = 85)

Knowledge	Ever screened	Never screened	Total	PR (95% CI)	*p* value
Adequate	12/19.4	50/80.6	62	1.0	0.031
Inadequate	0/0.0	23/100.0	23	1.240 (1.098–1.401)	

Table 3 shows that 12 of 62 women with adequate knowledge (19.4%) had ever been screened with VIA, whereas none of the 23 women with inadequate knowledge had been screened. Knowledge was associated with VIA screening behavior (p = 0.031). The prevalence of never being screened was 1.240 times higher among women with inadequate than adequate knowledge (95% CI, 1.098–1.401).

Table 4. Association between attitude and VIA screening behavior (N = 85)

Attitude	Ever screened	Never screened	Total	OR (95% CI)	*p* value
Favorable	10/22.2	35/77.8	45	5.429 (1.111–26.517)	0.023
Unfavorable	2/5.0	38/95.0	40	1.0	

Table 4 demonstrates that 10 of 45 women with a favorable attitude (22.2%) had ever been screened with VIA, compared with 2 of 40 women with an unfavorable attitude (5.0%). Attitude was associated with VIA screening behavior (p = 0.023). The odds of having previously undergone VIA screening were 5.429 times higher among women with a favorable attitude (95% CI, 1.111–26.517), although the wide confidence interval indicates substantial uncertainty.

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DISCUSSION

Knowledge and VIA screening behavior

Knowledge was associated with VIA screening behavior (p = 0.031). All respondents with inadequate knowledge had never been screened with VIA, while 80.6% of those with adequate knowledge had also never been screened. Accordingly, the PR of 1.240 refers specifically to the prevalence of never being screened among women with inadequate versus adequate knowledge. This pattern supports an association between knowledge and participation but also shows that knowledge alone is insufficient to ensure screening uptake.

The finding is consistent with Indonesian studies reporting links between knowledge and VIA-related behaviour, intention, or uptake (Hanudji et al., 2021; Hartati et al., 2025; Jingsung, 2025; Rotua, Mamuroh, & Yamin, 2024). Educational interventions may improve knowledge and attitudes, although actual participation also depends on access, social support, perceived barriers, and opportunity (Burhan, Chaniago, Abdillah, Zulviyanda, Triananda, & Zachraina, 2025; Gumilang, Sundayani, & Remami, 2026).

Evidence on willingness and interest in VIA screening likewise suggests that awareness does not automatically translate into participation (Hassan et al., 2018; Komariyah et al., 2023; Putri et al., 2018). Increasing screening uptake therefore requires accessible services, clear referral pathways, community engagement, and strategies that reduce embarrassment, fear, and practical barriers.

Attitude and VIA screening behavior

Attitude was also associated with VIA screening behaviour (p = 0.023). Women with a favorable attitude had higher odds of having previously undergone VIA screening (OR = 5.429), but the 95% confidence interval was wide (1.111–26.517). The point estimate should therefore be interpreted cautiously because only 12 women in the sample had ever been screened with VIA.

The Theory of Planned Behavior proposes that a positive attitude can strengthen intention, but action also depends on perceived behavioural control and social influence (Ajzen, 2020). This may help explain why 77.8% of women with a favorable attitude in the present study still had never been screened with VIA. Other studies have similarly identified knowledge, attitude, motivation, and perceived behavioural control as factors related to VIA interest or participation (Wijayanti & Raidanti, 2023; Nursanti & Ellina, 2022; Suhaid & Kusmiyanti, 2022).

LIMITATIONS

Several limitations should be considered. The cross-sectional design cannot establish temporal order or causality, and purposive sampling from one health-center area limits generalisability. Knowledge and attitude were self-reported and may be affected by social desirability or recall bias. The analyses were bivariate and unadjusted, so possible confounding by education, parity, partner support, access, and socioeconomic conditions was not addressed. Only 12 respondents (14.1%) had ever undergone VIA screening. This low event frequency produced a zero cell in the knowledge table and a wide confidence interval for the attitude odds ratio, limiting precision of the effect estimates.

CONCLUSION

Most respondents had adequate knowledge and a favorable attitude, but only 14.1% had ever been screened with VIA. Knowledge and attitude were both associated with screening behavior. Women with inadequate knowledge had a higher prevalence of never being screened, while a favorable attitude was associated with higher odds of previous screening. Because the study was cross-sectional and the analyses were unadjusted, these findings should not be interpreted as causal.

SUGGESTION

Dwikora Jaya Community Health Center should combine regular cervical-cancer education with practical strategies that make screening easier to access, including community outreach, partner and family engagement, reminders, and clear referral pathways. Future research should use larger multicentre samples and multivariable analyses and should examine access, partner support, perceived barriers, self-efficacy, and socioeconomic factors. Prospective or mixed-methods designs would help clarify how these factors influence actual screening uptake.

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