

FACTORS ASSOCIATED WITH FREE HPV DNA SCREENING UTILIZATION AMONG WOMEN OF REPRODUCTIVE AGE

Leni Halimatusyadiah¹, Agriyaningsih Oktaviana Hadi², Fathiyati³, Intan Noviana⁴, Eko Prasetyo⁵

^{1,2,3,4}Bachelor of Midwifery Study Program, Sekolah Tinggi Ilmu Kesehatan Salsabila Serang, Indonesia

⁵Departement of Public Health, Institut Teknologi Kesehatan Cendekia Utama Kudus, Indonesia

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ABSTRACT

Utilization of free HPV DNA screening for early cervical cancer detection remains suboptimal among women of reproductive age. This cross-sectional study examined factors associated with free HPV DNA screening utilization among 300 women in Curug Manis Village, Serang City, Banten, Indonesia selected via simple random sampling. Data were collected using a validated questionnaire (Cronbach's $\alpha = 0.852$) and analyzed using Chi-square and binary logistic regression ($p < 0.05$). Overall, 62.3% of respondents had utilized the screening service. Bivariate analysis showed significant associations with knowledge, attitude, perception, family support, healthcare provider support, and healthcare access (all $p < 0.05$; OR range 1.68–1.95). Multivariable analysis identified knowledge (AOR = 1.94) and healthcare access (AOR = 1.83) as the strongest predictors. Screening utilization was influenced by both individual and healthcare service factors, with knowledge and access being most significant. Strengthening health education, improving service access, and enhancing family and provider engagement may increase screening coverage and support cervical cancer prevention in primary healthcare.

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Corresponding Author:

Leni Halimatusyadiah

Bachelor of Midwifery Study Program,

Sekolah Tinggi Ilmu Kesehatan Salsabila Serang,

Email: leni.halimatusyadiah@gmail.com

1. INTRODUCTION

Cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women worldwide despite being largely preventable through effective screening and timely treatment of precancerous

lesions. Persistent infection with high-risk human papillomavirus (HPV) is recognized as the necessary cause of almost all cervical cancer cases. Consequently, the World Health Organization (WHO) recommends HPV DNA or HPV nucleic acid amplification tests (HPV NAATs) as the preferred primary screening method because of their higher sensitivity for detecting high-grade cervical lesions compared with conventional cytology or visual inspection methods [1], [2]. Recent evidence further demonstrates that HPV-based screening provides superior long-term protection against cervical cancer and has become the cornerstone of the WHO strategy to eliminate cervical cancer as a public health problem [3], [4].

Indonesia has strengthened its commitment to the global cervical cancer elimination initiative by gradually implementing HPV DNA-based screening within primary healthcare services. The Ministry of Health has targeted women aged 30–69 years for HPV DNA screening and continues to expand access through community-based services, subsidized screening programs, and self-sampling initiatives [5],[6], [7], [8], [9]. Nevertheless, increasing service availability alone does not guarantee high participation. Reports from several regions indicate that the utilization of free HPV DNA screening remains below the expected national target, suggesting that behavioral and health system barriers continue to limit screening uptake even when financial barriers have been removed.

Health service utilization is influenced by a complex interaction of predisposing, enabling, and reinforcing factors as described in the PRECEDE–PROCEED model developed by Green and Kreuter [10]. Knowledge, attitudes, and health perceptions shape an individual's readiness to seek preventive care, whereas service accessibility functions as an enabling factor, and family and healthcare provider support reinforce health-related decision making. These behavioral determinants have consistently been associated with participation in cervical cancer screening programs across different settings [11], [10], [12], [13].

Previous studies have reported that women's knowledge, attitudes, self-efficacy, perceived benefits, husband or family support, and healthcare provider encouragement significantly influence cervical cancer screening behavior [14], [15], [16],[17]. However, most existing evidence has focused on visual inspection with acetic acid (VIA) or Pap smear screening, or has examined cervical cancer screening behavior in general. These screening approaches differ substantially from HPV DNA testing in terms of diagnostic performance, target population, screening interval, implementation strategy, and public perception. As countries transition from VIA- and cytology-based screening to HPV DNA-based primary screening, determinants of service utilization may also differ. Recent international studies have emphasized that successful implementation of HPV-based screening requires understanding not only test performance but also behavioral and health system factors affecting women's acceptance and utilization of HPV DNA testing [3], [4].

Despite the rapid expansion of free HPV DNA screening in Indonesia, evidence regarding factors associated with the utilization of free primary HPV DNA screening at the community level remains limited, particularly among women who already have physical access to the service. This represents an important knowledge gap because identifying barriers after service availability has been established is essential for improving program effectiveness and achieving the national cervical cancer elimination targets.

Therefore, this study aimed to analyze factors associated with the utilization of free HPV DNA screening among women of reproductive age in Curug Manis Village, the working area of Curug Primary Health Center, Serang City, Banten, Indonesia. The findings are expected to provide evidence for strengthening community health education, improving healthcare accessibility, and optimizing family and healthcare provider involvement to increase participation in HPV DNA screening programs.

2. RESEARCH METHOD

2.1 Study Design and Setting

This analytical quantitative study employed a cross-sectional design to identify factors associated with the utilization of free HPV DNA screening among women of reproductive age. Because exposure and outcome variables were measured simultaneously, this design allows identification of statistical associations but does not permit causal inference. The study was conducted between January and April 2026 in Curug Manis Village, the working area of Curug Primary Health Center, Serang City, Banten, Indonesia where a government-funded HPV DNA screening program had been implemented.

2.2 Population and Sampling

The target population consisted of all married women of reproductive age (20–49 years) registered in Curug Manis Village ($N = 1,206$). The required sample size was calculated using the Slovin formula with a 95% confidence level and a 5% margin of error, resulting in a minimum sample of 300 participants. Although the Slovin formula was used to determine the minimum sample size based on the population size, it does not specifically account for the outcome proportion or the number of predictors included in a multivariable logistic regression model. Therefore, the adequacy of the multivariable logistic regression model was additionally assessed using the Hosmer–Lemeshow goodness-of-fit test.

A complete sampling frame was obtained from the family registration database maintained by Curug Primary Health Center and verified through village administrative records and community health volunteers (kader kesehatan). Each eligible woman was assigned a unique identification number, and participants were selected using a computer-generated simple random sampling procedure.

Women meeting the inclusion criteria were contacted through community health volunteers and invited to participate. When an eligible woman declined participation, could not be contacted after three separate visits on different days, or did not complete the questionnaire, she was classified as a non-respondent. Non-respondents were replaced by the next randomly selected identification number from the reserve sampling list that had been generated using the same randomization procedure. This approach ensured that every eligible woman had an equal probability of selection while minimizing potential selection bias.

2.3 Eligibility Criteria

The inclusion criteria were women aged 20–49 years who were married or had ever engaged in sexual intercourse, were registered as residents of Curug Manis Village, agreed to participate voluntarily, and signed written informed consent.

Women who had undergone total hysterectomy, experienced cognitive or communication impairment, withdrew during data collection, or returned incomplete questionnaires were excluded from the analysis.

2.4 Study Variables and Measurement

The dependent variable was utilization of free HPV DNA screening, defined as self-reported history of receiving HPV DNA screening through the government-funded program at Curug Primary Health Center.

Independent variables included:

- a. Age
- b. Educational level
- c. Employment status
- d. Knowledge
- e. Attitude
- f. Perception
- g. Family support
- h. Healthcare provider support
- i. Healthcare access

Questionnaires were developed based on previous studies and health behavior theories, particularly the PRECEDE–PROCEED model. Prior to data collection, the instrument underwent content validation by public health and reproductive health experts, followed by pilot testing among women outside the study area. Reliability testing demonstrated good internal consistency (Cronbach's $\alpha = 0.852$).

Knowledge was assessed using 15 true–false questions and categorized as good ($\geq 75\%$ correct) or poor ($< 75\%$). Attitude, perception, family support, healthcare provider support, and healthcare access were measured using Likert-scale items (1–4), with total scores categorized into high/low or positive/negative based on the median score.

2.5 Operational Definitions

Table 1: Operational Definition of Study Variables

Variable	Operational Definition	Measurement	Categories	Scale
HPV DNA Screening Utilization	Self-reported participation in free HPV DNA screening	Questionnaire	Yes / No	Nominal
Age	Respondent's age (years)	Questionnaire	20–34; ≥ 35	Ordinal
Education	Highest educational attainment	Questionnaire	Low; High	Ordinal

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Table 1 – continued from previous page

Variable	Operational Definition	Measurement	Categories	Scale
Employment	Current employment status	Questionnaire	Employed; Unemployed	Nominal
Knowledge	Understanding of HPV, cervical cancer and HPV DNA screening	15 items	Good; Poor	Ordinal
Attitude	Positive evaluation toward HPV DNA screening	15 Likert items	Positive; Negative	Ordinal
Perception	Perceived susceptibility, benefit and barriers	15 Likert items	Positive; Negative	Ordinal
Family Support	Emotional, informational and instrumental support	12 Likert items	High; Low	Ordinal
Healthcare Provider Support	Information, recommendation and encouragement from health workers	12 Likert items	Good; Poor	Ordinal
Healthcare Access	Accessibility and convenience of obtaining HPV DNA screening	10 Likert items	Easy; Difficult	Ordinal

2.6 Data Collection

Data were collected through face-to-face interviews conducted by trained enumerators using structured questionnaires. Enumerators received standardized training on interview techniques, research ethics, questionnaire administration, and confidentiality procedures before field implementation. Supervisors reviewed completed questionnaires daily to ensure completeness and consistency.

2.7 Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 24. Descriptive statistics were used to summarize respondent characteristics and study variables. Associations between independent variables and HPV DNA screening utilization were examined using the Chi-square test, with odds ratios (ORs) and 95% confidence intervals (CIs).

Variables with a p -value < 0.25 in the bivariate analysis were entered into a multivariable binary logistic regression model using the backward likelihood ratio method to identify factors independently associated with HPV DNA screening utilization. Adjusted odds ratios (AORs) with 95% confidence intervals were reported. Statistical significance was established at $p < 0.05$.

2.8 Ethical Considerations

The study received ethical approval from the Health Research Ethics Committee of Universitas Muhammadiyah Purwokerto (Approval No. KEPK/UMP/19/V/2026). At the time of the study, STIKes Salsabila Serang did not have an institutional health research ethics committee; therefore, ethical review was obtained from the Health Research Ethics Committee of Universitas Muhammadiyah Purwokerto. Written informed consent was obtained from all participants before enrollment. Participation was voluntary, and participants were free to withdraw at any stage without consequences. Personal identifiers were removed from the dataset to ensure confidentiality and anonymity throughout the study.

3. RESULT AND ANALYSIS

3.1 Participant Characteristics

A total of 300 women of reproductive age were included in the final analysis. Overall, 187 participants (62.3%) had utilized the free HPV DNA screening service, whereas 113 (37.7%) had never undergone HPV DNA screening.

Most respondents were aged 20–34 years (61.3%), had low educational attainment (61.0%), and were employed (57.0%). Regarding behavioral variables, 56.3% had poor knowledge, 56.3% had a positive attitude, 58.3% had positive perceptions, 57.3% reported high family support, 54.7% reported good healthcare provider support, and 56.3% reported easy access to HPV DNA screening services (Table 2).

Table 2: Characteristics of Study Participants (n = 300)

Variable	Category	n	%
HPV DNA screening utilization	Yes	187	62.3
	No	113	37.7
Age	20–34 years	184	61.3
	≥35 years	116	38.7
Education	Low	183	61.0
	High	117	39.0
Employment	Employed	171	57.0
	Unemployed	129	43.0
Knowledge	Good	131	43.7
	Poor	169	56.3
Attitude	Positive	169	56.3
	Negative	131	43.7
Perception	Positive	175	58.3
	Negative	125	41.7
Family support	High	172	57.3
	Low	128	42.7
Healthcare provider support	Good	164	54.7
	Poor	136	45.3
Healthcare access	Easy	169	56.3
	Difficult	131	43.7

3.2 Association Between Independent Variables and HPV DNA Screening Utilization

The bivariate analysis is presented in Table 3. There were no statistically significant associations between HPV DNA screening utilization and age ($p = 0.251$), educational level ($p = 0.228$), or employment status ($p = 0.193$). Significant associations were identified between HPV DNA screening utilization and: Knowledge (OR = 1.95; 95% CI: 1.20–3.17; $p = 0.006$); Attitude (OR = 1.75; 95% CI: 1.09–2.80; $p = 0.020$); Perception (OR = 1.68; 95% CI: 1.05–2.70; $p = 0.031$); Family support (OR = 1.76; 95% CI: 1.10–2.83; $p = 0.018$); Healthcare provider support (OR = 1.75; 95% CI: 1.09–2.81; $p = 0.019$); and Healthcare access (OR = 1.85; 95% CI: 1.15–2.97; $p = 0.010$). Detailed frequencies, odds ratios, confidence intervals, and p-values are presented in Table 3.

Table 3: Bivariate Analysis of Factors Associated with HPV DNA Screening Utilization among Women of Reproductive Age (n = 300)

Variable	Category	Yes n (%)	No n (%)	OR	95% CI	p-value
Age	20–34 years	110 (59.8)	74 (40.2)			
	≥35 years	77 (66.4)	39 (33.6)	0.753	0.464–1.223	0.251
Educational level	Low	119 (65.0)	64 (35.0)	1.340	0.832–2.158	0.228
	High	68 (58.1)	49 (41.9)			
Employment status	Employed	112 (65.5)	59 (34.5)	1.367	0.853–2.189	0.193
	Unemployed	75 (58.1)	54 (41.9)			
Knowledge	Good	93 (71.0)	38 (29.0)	1.953	1.203–3.169	0.006
	Poor	94 (55.6)	75 (44.4)			
Attitude	Positive	115 (68.0)	54 (32.0)	1.745	1.088–2.798	0.020
	Negative	72 (55.0)	59 (45.0)			
Perception	Positive	118 (67.4)	57 (32.6)	1.680	1.046–2.698	0.031
	Negative	69 (55.2)	56 (44.8)			
Family support	High	117 (68.0)	55 (32.0)	1.763	1.098–2.829	0.018
	Low	70 (54.7)	58 (45.3)			
Healthcare provider support	Good	112 (68.3)	52 (31.7)	1.752	1.093–2.807	0.019

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Table 3 – continued from previous page

Variable	Category	Yes n (%)	No n (%)	OR	95% CI	p-value
Healthcare access	Poor	75 (55.1)	61 (44.9)	1.850	1.153–2.968	0.010
	Easy	116 (68.6)	53 (31.4)			
	Difficult	71 (54.2)	60 (45.8)			

3.3 Multivariable Logistic Regression

Variables selected from the bivariate analysis were entered into the multivariable logistic regression model. As shown in Table 4, two of the three variables retained in the final model were significantly independently associated with HPV DNA screening utilization. Women with good knowledge were more likely to utilize HPV DNA screening than those with poor knowledge (AOR = 1.94; 95% CI: 1.18–3.18; $p = 0.009$). Likewise, respondents reporting easy healthcare access were more likely to utilize HPV DNA screening than those reporting difficult access (AOR = 1.83; 95% CI: 1.13–2.96; $p = 0.015$). Healthcare provider support showed a positive association with HPV DNA screening utilization; however, the association did not reach statistical significance after adjustment (AOR = 1.60; 95% CI: 0.99–2.60; $p = 0.056$).

Table 4: Multivariable Logistic Regression Analysis of Factors Associated with HPV DNA Screening Utilization among Women of Reproductive Age ($n = 300$)

Variable	β	SE	Adjusted OR (AOR)	95% CI	p-value
Knowledge (Good vs. Poor)	0.663	0.252	1.94	1.18–3.18	0.009
Healthcare provider support (Good vs. Poor)	0.471	0.246	1.60	0.99–2.60	0.056
Healthcare access (Easy vs. Difficult)	0.602	0.247	1.83	1.13–2.96	0.015

Model diagnostics indicated adequate goodness-of-fit based on the Hosmer–Lemeshow test ($\chi^2 = 5.857$, $df = 8$, $p = 0.663$). The final model had a Nagelkerke R^2 of 0.080. No evidence of problematic multicollinearity was observed, with tolerance values ranging from 0.982 to 0.992 and VIF values ranging from 1.008 to 1.019.

3.4 Discussion

This study demonstrated that knowledge and healthcare access were the strongest factors associated with the utilization of free HPV DNA screening among women of reproductive age. Although the screening program was offered free of charge, utilization was determined not only by service availability but also by women's readiness to seek preventive healthcare. These findings support the PRECEDE–PROCEED model, which explains that health service utilization results from the interaction between predisposing, enabling, and reinforcing factors rather than from the availability of services alone [2], [10], [13].

Knowledge was identified as the most influential determinant of HPV DNA screening utilization. Women with good knowledge were almost twice as likely to utilize HPV DNA screening as women with poor knowledge. Adequate knowledge improves women's understanding of HPV infection, cervical cancer risk, and the benefits of early detection, thereby facilitating informed decision-making. This finding is consistent with previous studies reporting that knowledge is one of the strongest predictors of cervical cancer screening participation across different countries and healthcare systems [14], [15], [18], [19].

Healthcare access also remained independently associated with HPV DNA screening utilization. Although HPV DNA screening was provided without charge, barriers related to travel distance, transportation, service availability, waiting time, and convenience may still reduce women's willingness to participate. Previous international studies have shown that increasing accessibility through community-based services, primary healthcare integration, and self-sampling strategies substantially improves HPV screening uptake. Therefore, expanding geographical and organizational access remains an essential component of cervical cancer elimination programs [1], [2], [3], [20].

Attitude, perception, family support, and healthcare provider support were significantly associated with HPV DNA screening utilization in the bivariate analysis but were no longer statistically significant after multivariable adjustment. This finding suggests that these psychosocial variables may exert indirect effects through knowledge and healthcare access. Within the PRECEDE–PROCEED framework, attitudes and perceptions function as predisposing factors, whereas family support and healthcare provider support reinforce health-related decision-making. When knowledge and healthcare access are simultaneously considered, the independent contribution of some reinforcing factors may become attenuated, potentially reflecting conceptual overlap among these determinants rather than problematic multicollinearity, which was not observed in the final multivariable model [10], [13], [18].

An important finding of this study was that age, educational level, and employment status were not significantly associated with HPV DNA screening utilization. Although these sociodemographic characteristics are frequently associated with preventive health behavior, several explanations may account for the present findings. First, the implementation of a free community-based screening program may have reduced socioeconomic inequalities in service utilization. Second, health promotion activities delivered through primary healthcare services may have provided relatively similar information across demographic groups. Third, formal educational attainment does not necessarily reflect HPV-related health literacy, particularly when health education is delivered directly through community outreach activities [18], [19], [21].

The absence of significant associations between age, education, and employment status is consistent with recent international evidence showing that psychosocial and healthcare system factors often explain cervical cancer screening behavior more strongly than demographic characteristics. A recent umbrella review reported that knowledge, perceived susceptibility, social support, and healthcare accessibility consistently predict screening uptake, whereas associations with age and education vary considerably across countries depending on healthcare systems and screening policies. Similarly, studies evaluating HPV-based primary screening have concluded that behavioral determinants become increasingly important as financial and structural barriers are reduced [19], [21], [20].

Compared with previous studies, this research provides additional evidence by specifically investigating the utilization of free primary HPV DNA screening, whereas most previous studies evaluated VIA, Pap smear, or cervical cancer screening behavior in general. HPV DNA testing differs from conventional screening methods because it has higher diagnostic sensitivity, longer recommended screening intervals, and has become the WHO-recommended primary screening method. Consequently, determinants influencing participation in HPV DNA screening may differ from those influencing participation in VIA or cytology-based screening programs [1], [2], [3], [22].

From a public health perspective, these findings indicate that improving cervical cancer screening coverage requires comprehensive interventions addressing both individual and healthcare system determinants. Community-based health education should strengthen women's knowledge regarding HPV infection and cervical cancer prevention, while health authorities should improve service accessibility through outreach activities, flexible clinic schedules, and integration of HPV DNA screening into routine reproductive health services. Strengthening family engagement and healthcare provider communication may further enhance women's participation and contribute to achieving the WHO cervical cancer elimination targets [2], [4], [8], [20].

This study has several methodological limitations. The cross-sectional design limits the ability to establish causal relationships between the independent variables and HPV DNA screening utilization. In addition, the sample size was determined using the Slovin formula, which does not specifically account for outcome prevalence or the number of predictors included in multivariable analysis. Therefore, this limitation should be considered when interpreting the multivariable findings. Nevertheless, the adequacy of the final multivariable model was additionally assessed using the Hosmer–Lemeshow goodness-of-fit test and multicollinearity diagnostics.

4. CONCLUSION

This study demonstrated that the utilization of free HPV DNA screening among women of reproductive age was primarily associated with knowledge and healthcare access, highlighting the relevance of both individual health literacy and service accessibility to cervical cancer screening uptake. These findings suggest that, alongside the availability of free screening services, strengthening community awareness and addressing potential access barriers may be important for improving screening participation. In primary healthcare settings, HPV education, counseling by healthcare workers, and collaboration with community health volunteers may be considered as strategies to reach women who have not yet participated in screening. Such integrated community- and primary care-based approaches may contribute to improving HPV DNA screening coverage and supporting Indonesia's cervical cancer elimination program.

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REFERENCES

- [1] World Health Organization, "Who guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention," 2021. Available from: NCBI Bookshelf.
- [2] World Health Organization, "Human papillomavirus (hpv) nucleic acid amplification tests (naats) to detect cervical pre-cancer," 2022.
- [3] S. Desai *et al.*, "Cervical cancer prevention: Human papillomavirus testing as primary screening," *Cancer*, 2022.
- [4] Ministry of Health of the Republic of Indonesia, "Ministry of health determined speed up elimination cancer cervical," February 22 2024. Accessed January 28, 2026.
- [5] Ministry of Health of the Republic of Indonesia, "Deputy minister of health confirm commitment elimination cancer neck uterus 2030 through integrated hpv dna screening," January 27 2026. Accessed January 28, 2026.
- [6] Antara News, "Ministry of health: 666,000 people will undergo hpv dna screening by 2025 to prevent cancer cervix," January 27 2026. Accessed January 28, 2026.
- [7] Ministry of Health of the Republic of Indonesia, "National cancer plan 2024–2034," 2024.
- [8] Ministry of Health of the Republic of Indonesia, "National action plan for cervical cancer elimination in indonesia," 2023. Accessed January 28, 2026.
- [9] Ministry of Health of the Republic of Indonesia, "World cancer day: Detection early cancer more easy and cheap at the community health center," February 17 2024. Accessed January 28, 2026.
- [10] R. Harini *et al.*, "Husband support mediates the association between self-efficacy and cervical cancer screening among women in rural indonesia," 2021.
- [11] M. Munizar *et al.*, "Barriers to cervical cancer screening," *Asian Pacific Journal of Cancer Prevention*, 2025.
- [12] S. I. Putri *et al.*, "Associated factors of cervical cancer screening intention/behavior," 2025.
- [13] N. N. H. G. Wardani *et al.*, "A study of cervical cancer screening at community health center: Barriers, fear, knowledge, stigma, and organizational issues," 2025.
- [14] S. Notoatmodjo, *Science Behavior Health*. Jakarta: Rineka Cipta, 2014.
- [15] L. W. Green and M. W. Kreuter, *Health Program Planning: An Educational and Ecological Approach*. New York: McGraw-Hill Education, 4th ed., 2005.
- [16] R. Febriandriani, D. E. Anggreny, and Heriziana, "Related factors with interest woman age fertile do iva examination," *Aura Medical Journal*, vol. 3, no. 1, pp. 195–200, 2025.
- [17] R. Annisa, H. F. Manullang, and Y. O. Simanjuntak, "Determinants compliance use tool protector personal protective equipment (ppe) for pt. x project workers development 2019," *Jurnal Peneliti Kesehatan Masyarakat*, vol. 2, no. 2, pp. 25–39, 2020.
- [18] T. Rana, D. N. S. Chan, B. M. H. Law, S. Shrestha, and W. K. W. So, "Determinants of cervical cancer screening utilisation among women in the least developed countries: A systematic review and meta-analysis," *PLoS One*, vol. 20, no. 6, p. e0321627, 2025. <https://doi.org/10.1371/journal.pone.0321627>.
- [19] B. A. Mengistie *et al.*, "Uptake of cervical cancer screening and its determinants in africa: An umbrella review," *PLoS One*, vol. 20, no. 7, p. e0328103, 2025. <https://doi.org/10.1371/journal.pone.0328103>.
- [20] M. Smith *et al.*, "Uptake and performance of self-collection offered through primary care to all eligible participants in a national cervical screening programme in australia: A retrospective cohort study," *Lancet Public Health*, vol. 11, no. 2, pp. e101–e110, 2026. [https://doi.org/10.1016/S2468-2667\(25\)00304-4](https://doi.org/10.1016/S2468-2667(25)00304-4).
- [21] J. H. Lim, L. L. Yeap, P. S. Saw, K. Y. Ng, and Y. J. Wong, "Determinants of cervical cancer screening in southeast asia: A systematic review using the com-b model and the theoretical domains framework," *Preventive Medicine*, vol. 207, p. 108564, 2026. <https://doi.org/10.1016/j.ypmed.2026.108564>.
- [22] J. Dickinson *et al.*, "On the path toward cervical cancer elimination in canada: A national survey of factors influencing women's intentions to participate in human papillomavirus test-based primary cervical screening," *Lancet Regional Health – Americas*, vol. 34, p. 100901, 2024. <https://doi.org/10.1016/j.lana.2024.100901>.

- [23] Faisaluddin, *Psychology Textbook*. Purbalingga: Eureka Media Aksara, 2024.
- [24] A. Salim and Y. D. Setiyowati, “Relationship between knowledge and attitudes to behavior prevention cervical cancer in management program students at university x depok,” *Malahayati Nursing Journal*, vol. 8, no. 2, pp. 342–353, 2026.
- [25] I. K. Swarjana, *Concept Knowledge, Attitude, Behavior, Perception, Stress, Anxiety, Pain, Social Support, Compliance, Motivation, Satisfaction, COVID-19 Pandemic, Access Service Health*. Yogyakarta: Andi Publisher, 2022.