Original Article

Addressing Barriers to HPV Screening Among Women: A Study Overview

Budiman Bela,[*,] Soni Hartono,[**] Ekawati Betty Pratiwi,[**] Hesti Pramesti Cahyani,[**] Silvia Tri Widyaningtyas[**]**

[*]*Microbiology Department Faculty of Medicine Universitas Indonesia*
[**]*Virology and Cancer Pathobiology Research Centre Faculty of Medicine, Universitas Indonesia*

Abstract

Introduction: *A major challenge in the success of HPV screening programs is achieving 70% coverage of women aged 30-69. This study conducted a survey to examine the factors influencing the willingness of woman in that age group to actively engage HPV screening program.*
Method: *Socio-demographic data, knowledge levels, cervical cancer screening uptake, and willingness to participate in the government's routine screening program were collected digitally using cross-sectional study. Factors associated with knowledge, participation, and willingness to engage program measured using logistic regression analysis.*
Result: *Among the 87 eligible respondents, 96.6% had heard about cervical cancer mostly via internet, and 51% categorized as having low level knowledge. The percentage of participants willingness to participate in program was 67.82% below the percentage government target coverage. Factors correlated with willingness included: age group 36-40 (aOR = 1.865, 95% CI = 0.567-6.129) and 41-45 (aOR = 2.93, 95% CI = 0.762-11.272), monthly household expense (aOR = 1.682, 95% CI = 0.684-4.138), having relatives suffer cervical cancer (aOR = 2.764, 95% CI = 0.790-9.672), history of HPV vaccination (aOR = 1.187, 95% CI = 0.593-7.539).*
Conclusion: *Respondent willingness to participate in HPV screening program remains to be improved. Various ways to increase participation in screening programs need to be developed to reach various populations of women.*

Keywords: *HPV, Screening program, Level knowledge, Willingness to participate*

Korespondensi: **Budiman Bela**
E-mail: *budiman.bela@ui.ac.id*

Mengatasi Tantangan Skrining HPV pada Perempuan: Sebuah Kajian Umum

Budiman Bela,[,**] Soni Hartono,[**] Ekawati Betty Pratiwi,[**] Hesti Pramesti Cahyani,[**] Silvia Tri Widyaningtyas[**]*

**Departemen Mikrobiologi, Fakultas Kedokteran, Universitas Indonesia*
***Pusat Riset Virologi and Kanker Patobiologi, Fakultas Kedokteran, Universitas Indonesia*

Abstrak

Pendahuluan: *Tantangan utama keberhasilan program skrining HPV adalah mencapai cakupan 70% perempuan usia 30-69. Dalam Studi ini dilakukan survei untuk meneliti faktor-faktor yang memengaruhi tingkat pengetahuan, kesadaran, partisipasi dalam pengujian, dan kemauan perempuan untuk terlibat aktif dalam program skrining.*
Metode: *Data social demografi, tingkat pengetahuan, partisipasi dan kemauan untuk terlibat dalam program skrining dikumpulkan secara digital menggunakan studi cross-sectional. Faktor yang berpengaruh pada pengetahuan, partisipasi, dan kemauan untuk terlibat dalam program dianalisis dengan regresi logistik.*
Hasil : *Dari 87 responden yang memenuhi syarat, 96,6% pernah mendengar tentang kanker serviks terutama melalui internet, dan 49% diantaranya dikategorikan memiliki pengetahuan tinggi. Mayoritas (67,82%) menyatakan bersedia untuk berpartisipasi dalam program skreening. Faktor-faktor yang berkorelasi positif dengan kemauan meliputi: kelompok usia 36-40 (aOR = 1,865, 95% CI = 0,567-6,129) dan 41-45 (aOR = 2,93, 95% CI = 0,762-11,272), pengeluaran rumah tangga bulanan (aOR = 1,682, 95% CI = 0,684-4,138), memiliki kerabat yang menderita kanker serviks (aOR = 2,764, 95% CI = 0,790-9,672), riwayat vaksinasi HPV (aOR = 1,187, 95% CI = 0,593-7,539).*
Kesimpulan: *Kesadaran responden untuk berpartisipasi dalam program skrining HPV masih perlu ditingkatkan. Berbagai cara untuk meningkatkan partisipasi dalam program skrining perlu dikembangkan agar dapat menjangkau berbagai populasi perempuan.*

Kata Kunci: *HPV, Screening program, Level knowledge, Willingness to participate*

Introduction

According to the Global Cancer Observatory (Globocan), cervical and uterine cancers rank as the 8th most common cancers worldwide, with 662,301 reported cases and 348,874 deaths. In 2024, approximately 60% of these cases (397,082) occurred in Asia, contributing to a mortality rate of 199,798, or 57.3% of global deaths due to cervical and uterine cancer. Among Asian countries, Indonesia ranks 6th in both cases and mortality, following Bangladesh, Bhutan, Myanmar, Sri Lanka, and India. In 2024 alone, Asia recorded 220,226 cases of cervical and uterine cancers, with 114,248 deaths.[1]

Approximately 95% of cervical cancers were associated with the infection of the human papillomavirus (HPV). Human papillomavirus (HPV) is a group of over 200 related viruses, and based on their ability to cause cancer, HPV was categorized into low-risk and high-risk types. Among the 18 types of high-risk groups, HPV types 16 and 18 are responsible for 70% of cervical cancer cases worldwide.[2]

In 2020, the World Health Organization announced a global strategy to eliminate cervical cancer, in which countries must achieve and maintain the HPV incidence rate below 4 per 100,000 women. Three main pillars that must be implemented to lower the incident rate are that 90% of girls by age 15 years must be fully vaccinated, 70% of women by age 35 must be screened for HPV using high-performance tests and repeated once by 45 years old, and 90% of women with cervical disease receive treatment.[3]

Referring to WHO guidelines, the Ministry of Health of the Republic of Indonesia published the National Action Plan to eliminate cervical cancers. The action was focused on HPV immunization for 5th and 6th grade girls, expanding the coverage of national immunization, and early screening of cervical cancer by detecting the HPV DNA and targeting 75% of women aged 30-69 years to get screened; 90% of girls aged 15 years get HPV immunization by 2027, and by 2028-2030 for boys.[4]

Awareness and knowledge of HPV will affect the success of early cervical cancer screening programs, which are one of the pillars that determine the success of HPV control. Australia and the United Arab Emirates (UAE) have significantly decreased cervical cancer incidence rates after implementing screening programs.[5] Since introducing in 1999, the National Cervical Screening Program (NCSP) has led to an 80% drop in cervical cancer incidence and mortality rate.[6]

Several studies have highlighted differences in women's awareness and knowledge of HPV. Surveys conducted among the general public in Pittsburgh, Pennsylvania, and Hampton, Virginia, as well as studies involving college students, revealed a high level of understanding and awareness.[7-9] Conversely, research in Great Britain (including England, Scotland, and Wales), India, Nigeria, and Indonesia showed a lower level of awareness and knowledge among women.[10-15]

HPV screening coverage in Indonesia remains low, with only about 7.02% of women aged 30-50 undergoing screening, far below the Ministry of Health target of 70% .[4,15] To boost community participation in the cervical cancer eradication program through routine screening, this study conducted a preliminary survey to assess the knowledge, awareness, and willingness of women aged 30-69 living in Jakarta. The study also examined factors influencing awareness and participation. Beyond providing insights into key aspects necessary for enhancing engagement in government initiatives, the findings can support questionnaire refinement and help to develop a more comprehensive set of questions for national surveys. Ultimately, this can generate more precise data, strengthening the effectiveness of the HPV screening program.

Metode

Study design and participants A cross-sectional study was used to assess the knowledge of cervical cancer among women aged 30-69 living Jakarta, Indonesia. The study has been approved by the Ethical Committee Faculty of Medicine Universitas Indonesia with Protocol Number 24-10-1589 and date of release 07 Januari 2025. Every respondent agreed to be involved in the survey by signing online informed consent at the start of the survey. The survey was conducted anonymously. The classification of middle-class and lower-income households in Indonesia is determined based on monthly household expenditures, as reported by the World Bank.[17]

Questionnaire Design The questionnaire comprises questions that address 1) socio-demographic characteristics such as age, education, occupation, monthly household expense, experience having a family member suffering from from cervical cancer, history of HPV vaccination, 2) awareness of HPV including the knowledge related to HPV infection, clinical signs and therapy methods 3) the behavior of cervical screening , willingness to undergo cervical screening, and obstacles to getting screened.

Statistical Analysis Descriptive statistics were applied to analyze socio-demographic characteristics, awareness, and screening behavior, presented as numbers and percentages. Cervical cancer knowledge was evaluated using a scoring system, where one point was awarded for each correct answer, and no points were given for incorrect responses. Respondents were classified into low- and high-knowledge groups based on the median knowledge score. To identify factors influencing knowledge, willingness, and uptake of cervical screening, univariate and multivariate logistic regression analyses were conducted. Data processing was performed using SPSS version 23 software (IBM Corp, 2013), with a significance level set at $p < 0.05$.

Result

Total individual browsing the questionnaire were 95, 94 signed an informed consent and completed the questionnaire. In addition, 7 respondents were excluded due to age that does not meet the survey criteria, 5 respondents were under 30-year-old and 2 respondents were over 65 years old. Table 1 shows the demography data of the respondents involved in study. A total 87 women included into analysis Around 35.63% holding college degree. Majority of respondents are housewife (78.16%), 18.39 % were employee either as civil service or private sectors, and only 3.45% were job seekers. Nearly 51.72 % monthly expense were more than 2.040.000

rupiah. Most respondents (78.16%) did not have any relatives, friends, or acquaintances who have been diagnosed with cervical cancer and 81.61% had not received the HPV vaccine.

Table 1. Characteristic of Respondents

Characteristics	N	%
Age group		
30–35	34	39.08
36–40	19	21.84
41–45	17	19.54
46–65	17	19.54
Education		
High school and below	56	64.37
College and above	31	35.63
Occupation		
Housewife	68	78.16
Private employee	10	11.49
Civil servants	6	6.90
Unemployed	3	3.45
Monthly household expense (IDR)		
≤ 2.040.000	45	51.72
> 2.040.000	42	48.28
Knows someone with cervical cancer		
No	68	78.16
Yes	19	21.84
History of HPV vaccination		
No	71	81.61
Yes	16	18.39
Total	87	100.00

A significant majority of respondents (96.6%) heard the information about cervical cancer. The most common source of information is the internet (56%), followed by healthcare professionals such as midwives, nurses, and doctors (11%). Family members contributed 8% of the information shared, while obstetricians and television each account for 7%. Friends serve as a source for 5% of respondents, with other sources making up the remaining 6% (Figure 1). Based on the total number of correct answers across all criteria assessing cervical cancer knowledge. Respondents with median correct answers exceed 7, they fall into the high knowledge level category, whereas those scoring below were considered to have low knowledge levels. The 49% of respondents demonstrated a high-level knowledge, and 51% fell into low knowledge (Figure 1). The level of knowledge was assessed across 4 aspects, transmission and risk factors, clinical signs, therapy and hygiene. More than 50% respondent recognized HPV as the causa agent of cervical cancer as well as the risk associated with having multiple sex partner. However fewer than 30% of respondents were aware of the HPV transmission mode, the increased risk from early sexual activity (under age 20), and the contribution of smoking to cervical cancer risk (Figure 1).

Majority of respondents recognized unusual vaginal discharge as one of the clinical signs of cervical cancer. However, most of them were not aware of other symptoms of cervical cancer (Figure 1). Regarding cancer cervix therapy, over half of respondents provided accurate responses, though understanding of radiotherapy lagged (Figure 1). Interestingly, majority respondents believe herbs could be used in cervical cancer treatment. Most participants realized maintaining personal hygiene could reduce the risk of cervical cancer (Figure 1).

The factors relatives with knowledge about cancer cervices shown in table 2. In multivariate logistic regression analysis age 41-45 (aOR =0.19[95%CI:0.051-0.711]) has higher knowledge compared to other age groups. Education, occupation, monthly household expense, the experience of having relatives/ family/fiends diagnosed with cervical cancer and vaccination history did not relative with the level of knowledge (Tabel 2).

The proportion of respondents who have undergone HPV testing or received vaccination was relatively low, at 22.99% and 18.39%, respectively. Given the concern about low participation in HPV testing among women, multivariate logistic regression analysis was conducted to examine the factors associated with cervical cancer testing, as detailed in Table 3. Participants who have relatives, friends or family members that diagnose or suffer from cervical cancer were more likely to undergo laboratory test for HPV testing (aOR=1.704, 95%CI:0.539-4.897). Interestingly, women who had received HPV vaccination more likely to undergo HPV testing (aOR=6.664, 95% 95%CI = 2.118-20.969).

Majority participants (67.82%) expressed willingness to participate in the National HPV Screening Program. The factors that encourage willingness of participants peace of mind from knowing reproductive health status (30.00%), Getting prompt treatment if needed (20.00%), reducing the risk of financial impact (18.57%), preventing more severe disease (14.29%), and awareness of

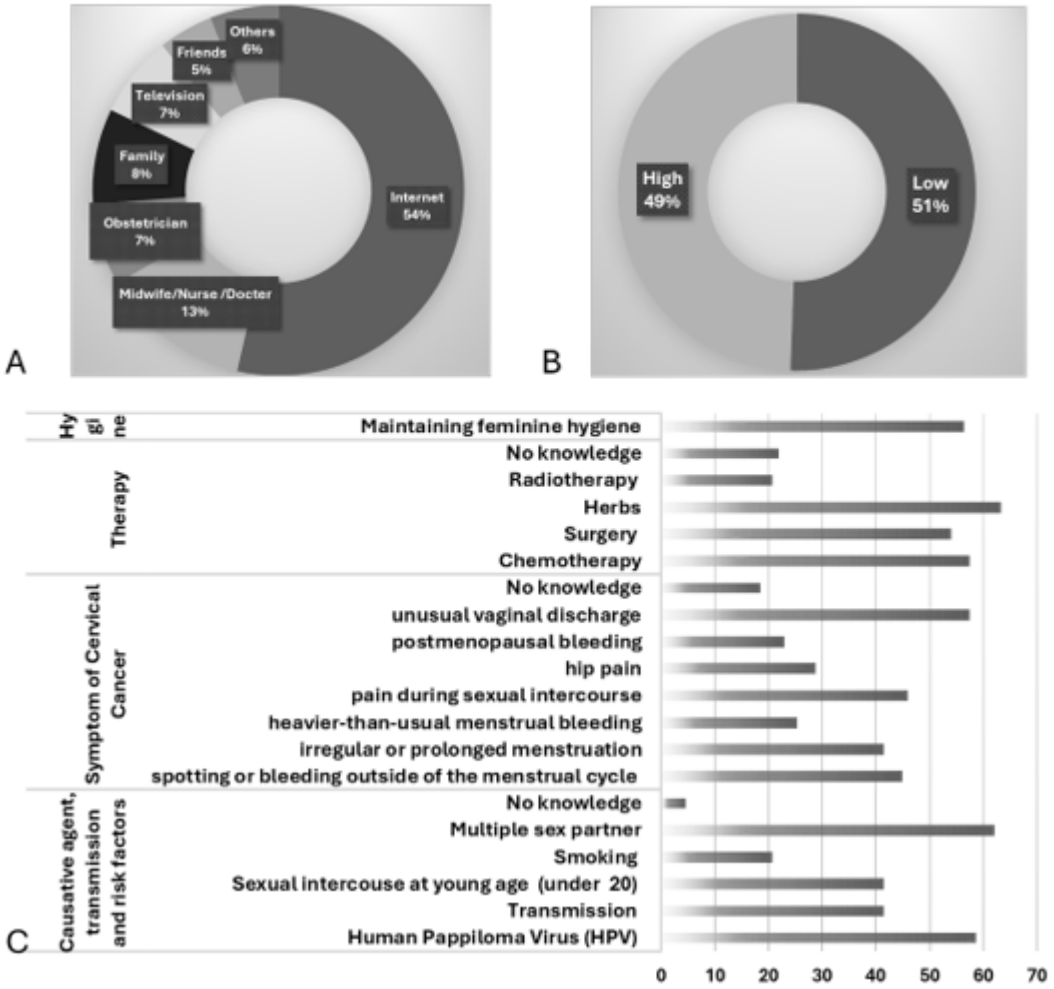

Figure 1. Source of Information and Knowledge Level of Respondent. A) Source of Information Regarding Cervical Cancer, B) Respondent Knowledge Level, C) The Knowledge of Respondent About Cervical Cancer

history/lifestyle or other risk factors (14.29%). A small percentage (1.43%) cited parents/ sibling/relative/friends have cervical cancer as reason for participation. Notably, none of the respondents indicated that support from a partner parents or family member played a role in their decision to join the screening program (Figure 2B).

Several factors may influence women's willingness to participate in HPV screening programs. The most common concerns include fear of pain (32.14%), pay for test (14.29%), concern about the test result (10.71%) and no knowledge (21,43%). Additional barriers, each affecting 3.57% of respondents, include past traumatic experience, taboo, judgment from spouses or family members, and do not understand the advantages of screening. However, respondents did not consider time and cost of visiting public healthcare facilities to be significant obstacles.

Factors relative with the willingness to participate in regular cervical cancer screening were age groups, monthly household expense, having relatives, friends or family members that diagnose or suffer cervical cancer and receiving HPV vaccination associated with the willingness of participants to join cervical cancer screening. Woman aged 36-40, and 40-45 more likely willing to participate in cervical cancer screening (aOR=1.865,95%-CI=0.567-6.129 and aOR 2.93,95%CI=0.762-11.272 respectively). Respondent with monthly household expanse >2.040.000 IDR more be voluntary joining the regular screening (aOR1.682(0.684-4.138). The willingness to participate in screening program also corelated with experience of having relatives who diagnosed or suffer cervical cancer (aOR = 2,764, 95%CI=0.790-9.672). Having HPV vaccination corelated the willingness of participant (aOR=1.187, 95%CI=0.593-7.539). Education, occupation, history of taking HPV testing and level of knowledge did not show any correlation with the willingness of screening participation (table 4).

Table 2. Association Factors of Knowledge Level about Cervical Cancer

Characteristics	High knowledge level		Odds ratio		p	Adjusted	95% CI	p value
	N	%	Crude	95%CI				
Age group								
30–35	21	48.84%	1			1		
36–40	8	18.60%	0.45	(0.143–1.413)	0.171	0.589	(0.165–2.096)	0.413
41–45	4	9.30%	0.19	(0.051–0.711)	0.014	0.228	(0.053–0.979)	0.047
46–65	10	23.26%	0.884	(0.270–2.901)	0.839	1.917	(0.456–8.056)	0.374
Education								
High school and below	25	58.14%	1			1		
College and above	18	41.86%	1.717	(0.707–4.168)	0.232	0.574	(0.165–2.001)	0.383
Occupation								
Housewives	32	74.42%	1			1		
Private employee	6	13.95%	1.688	(0.437–6.521)	0.448	1.467	(0.343–6.28)	0.606
Civil servants	4	9.30%	2.25	(0.386–13.117)	0.367	1.782	(0.22–14.453)	0.589
Unemployed	1	2.33%	0.563	(0.049–6.501)	0.645	0.319	(0.02–5.18)	0.422
Monthly household spend (IDR)								
≤ 2.040.000	18	41.86%	1			1		
> 2.040.000	25	58.14%	2.206	(0.936–5.200)	0.071	2.862	(0.902–9.08)	0.074
Knows someone with cervical cancer								
No	32	74.42%	1			1		
Yes	11	25.58%	1.547	(0.554–4.323)	0.405	1.787	(0.533–5.988)	0.347
History of HPV vaccination								
No	33	76.74%	1			1		
Yes	10	23.26%	1.919	(0.630–5.849)	0.252	2.333	(0.672–8.106)	0.182

Discussion

In this initial study, an analysis was conducted based on 87 responses from eligible participants. The majority of respondents were housewives, with educational backgrounds primarily at the high school level or below. From a socioeconomic perspective, some respondents belong to households with monthly expenditures of less than IDR 2,040,000 fall into poor class, and the more than IDR 2,040,000 categorized as middle class.[17]

The majority of respondents have heard of cervical cancer, but their overall knowledge of the disease remains relatively low. Most are aware that HPV virus infection was the primary cause of cervical cancer. The risk factor most widely known by respondents was multiple sex partners. However, a large portion of respondents lack awareness of how HPV is transmitted. The risk factors such as early sexual activity and smoking were largely unknown by most respondents. Among the clinical symptoms associated with HPV infection, only unusual vaginal discharge is widely recognized as an indicator. A similar pattern of limited knowledge regarding transmission and symptoms was previously reported among women in Yogyakarta.[14] Respondents were familiar with cervical cancer treatments, but some did not familiar with radiotherapy as one of the cervical cancer therapies. Most respondents agree that maintaining personal hygiene could help prevent HPV infection.

This study reveals an interesting positive relative between high-level knowledge and the 41-45 age group. Interestingly, high-level knowledge did not relative to any factors such as education, occupation, economic status, vaccination history, or having acquaintances diagnosed with cervical cancer. These findings contrast with those from Great Britain, where knowledge levels were positively linked to urban residency, higher education, and higher socioeconomic status.[18] Another significant finding was the absence of a correlation between knowledge levels and

Table 3. Association Factors of Receiving HPV Test

Characteristics	Receiving HPV test before		Odds ratio		p	Adjusted	95% CI	p
	N	%	Crude	95%CI				
Age group								
30–35	7	35.00%	1			1		
36–40	6	30.00%	1.765	(0.513–6.076)	0.367	2.148	(0.421–10.965)	0.358
41–45	4	20.00%	1.222	(0.321–4.658)	0.769	1.201	(0.208–6.949)	0.838
46–65	3	15.00%	0.885	(0.214–3.659)	0.866	1.106	(0.178–6.853)	0.914
Education								
High school and below	12	60.00%	1			1		
College and above	8	40.00%	1.288	(0.472–3.516)	0.622	0.583	(0.122–2.791)	0.5
Occupation								
Housewives	18	90.00%	1			1		
Private employee	1	5.00%	0.431	(0.071–2.614)	0.36	0.269	(0.025–2.921)	0.28
Civil servants	1	5.00%	0.744	(0.113–4.890)	0.759	1.422	(0.088–23.108)	0.804
Unemployed	0	0.00%	0.39	(0.019–7.917)	0.54	1.336	(0.077–23.231)	0.842
Monthly household spend (IDR)								
≤ 2.040.000	9	45.00%	1			1		
> 2.040.000	11	55.00%	1.403	(0.525–3.747)	0.5	1.118	(0.281–4.453)	0.875
Knows someone with cervical cancer								
No	11	55.00%	1			1		
Yes	9	45.00%	4.524	(1.533–13.350)	0.006	6.242	(1.514–25.737)	0.011
History of HPV vaccination								
No	11	55.00%	1			1		
Yes	9	45.00%	6.664	(2.118–20.969)	0.001	8.552	(1.204–48.845)	0.031
Level of knowledge			1.704	(0.593–4.897)	0.322	1.451	(0.393–5.365)	0.576

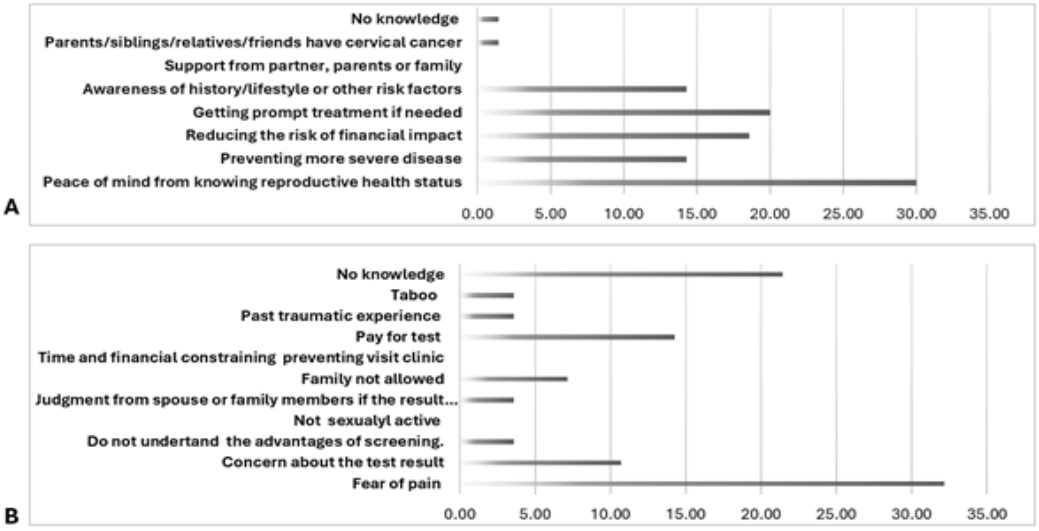

Figure 2. Factors affecting the willingness of respondents to join HPV screening program.
A) Respondents concern in joining programs,
B) Reasons why respondents refused joining programs

Table 4. Association Factors of Willingness to Regular Cervical Cancer Screening

Characteristics	Willingness to regular screening		Odds ratio		p	Adjusted	95% CI	p
	N	%	Crude	95%CI				
Age group								
30–35	20	48.84%	1			1		
36–40	14	18.60%	1.865	(0.567–6.129)	0.305	4.964	(1.093–22.551)	0.038
41–45	14	9.30%	2.93	(0.762–11.272)	0.118	6.497	(1.183–35.687)	0.031
46–65	11	23.26%	1.251	(0.387–4.047)	0.708	4.353	(0.877–21.603)	0.072
Education								
High school and below	39	58.14%	1			1		
College and above	20	41.86%	0.79	(0.316–1.973)	0.613	0.281	(0.066–1.206)	0.088
Occupation								
Housewives	45	74.42%	1			1		
Private employee	7	13.95%	1.107	(0.283–4.325)	0.884	1.939	(0.359–10.466)	0.441
Civil servants	4	9.30%	0.93	(0.183–4.718)	0.93	4.365	(0.439–43.385)	0.208
Unemployed	3	2.33%	3.615	(0.179–72.965)	0.402	2.233	(0.136–36.735)	0.574
Monthly household spend (IDR)								
≤ 2.040.000	28	41.86%	1			1		
> 2.040.000	31	58.14%	1.682	(0.684–4.138)	0.258	4.579	(1.111–18.873)	0.035
Knows someone with cervical cancer								
No	43	74.42%	1			1		
Yes	16	25.58%	2.764	(0.790–9.672)	0.112	6.233	(1.267–30.648)	0.024
History of HPV testing								
Tidak	41	69.49%	1			1		
Ya	18	30.51%	4.338	(1.061–17.737)	0.041	3.929	(0.693–22.267)	0.122
History of HPV vaccination								
No	46	76.74%	1			1		
Yes	13	23.26%	2.115	(0.593–7.539)	0.248	3.946	(1.204–48.845)	0.031
Level of knowledge			1.187	(0.498–2.832)	0.699	1.24	(0.424–3.629)	0.694

willingness to participate in routine screening programs. This contrasts with Zhang et al. who reported a positive relationship between knowledge and both willingness and actual participation in screening program.[21]

Likewise, respondents' knowledge levels did not show a positive association with prior HPV testing or HPV vaccination status. This contradicts Waller et al., who found that knowledge was positively linked to awareness and willingness to undergo HPV screening and vaccination.[11] About 22.99% of respondents reported having undergone HPV testing, even though this percentage was higher than national coverage, the percentage still below the Ministry of Health targets.[4] A limitation of the questionnaire used in this study was its failure to inquire about respondents' reasons for not undergoing HPV screening. Generally, barriers to screening include cost, pain, embarrassment, discomfort, and fear of test results, as noted by Olsson, et al.[19]

About 67,82% respondents expressed a willingness to participate in regular HPV screening that was almost close to the screening coverage announced by the government.[3,4] The key motivating factors were dominated by internal aspects such as peace of mind after receiving test results, early access to therapy if diagnosed, minimizing future treatment costs, and personal awareness of their past lifestyle that may pose risks. Other important factors that also contributed to willingness which also reported in other studies was having relations that diagnosed cervical cancer.[20,21] Interestingly no respondent answer the important of support from husband and/or other family members as factors that motivated them to join the screening program. This finding differs from studies conducted in two Indonesian cities,

North Tondano and Padang, that highlighted the crucial impact of husband's support in encouraging women to undergo routine screening tests.[22,23] Factors that strongly relative to the willingness in participating HPV screening were age group, economic status that measured by monthly expenses, having acquaintances diagnosed with cervical cancer, and history of HPV vaccination. However, knowledge level did not show a positive correlation with willingness, differing from findings reported by Zhang et al.[21]

Several internal factors hinder respondents from participating in the HPV screening program, including fear of pain and post-traumatic experiences at previous tests. Ensuring a comfortable and painless sampling process was crucial for increasing the willingness to join screening program. Self vaginal swab sampling or using urine might be used as alternative of cervical swab sampling.[24,25] Concern about knowing the HPV infection status is a inhibiting factor to participate in the HPV screening program in 32.14% of respondents. This was also found/not found in other studies.[13] About 14.29% of respondents are concerned about the cost of the test. As part of the national action plan to eliminate cancer, the government ensures free early screening services are available at healthcare facilities.[4] However 3.5% of respondents did not understand the advantages of screening. Education about the benefits of HPV screening for early intervention or for inhibiting HPV transmission by health workers or in other forms may be able to reduce this inhibiting factor.

Conclusion

This preliminary study concludes that women aged 36-45 in Jakarta show a significant willingness to undergo cervical cancer screening, despite having limited overall knowledge about the disease. The main obstacle to participating in HPV screening is the discomfort during sample collection. To meet the Ministry of Health of the Republic of Indonesia's 70% screening target, there needs to be a greater focus on delivering thorough health education through social media and health workers.

Conflicts of Interest

The authors declare no competing interests

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Author Contributions

Conceived and wrote the manuscript by BB; EBP : distributing and collecting questionnaire data, HPC: create Google Form and collecting questionnaire data; SH; statistical analysis; STW: Questionnaire design and wrote the manuscript

References

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. "Global Cancer Statistics 2022: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries." CA: a Cancer Journal for Clinicians.2024: 74(3): 229–63. Available from: https://pubmed.ncbi.nlm.nih.gov/38572751/
2. Kusakabe M, Taguchi A, Sone K, Mori M, Osuga Y. Carcinogenesis and management of human papillomavirus-associated cervical cancer. Int J Clin Oncol. 2023;28(8):965-74. Available from : https://pubmed.ncbi.nlm.nih.gov/37294390/
3. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. 2nd ed. Geneva: World Health Organization; 2021. Available from : https://iris.who.int/bitstream/handle/10665/342365/9789240030824-eng.pdf?sequence=1
4. Rencana Aksi Nasional (RAN) Eliminasi Kanker Leher Rahim di Indonesia Tahun 2023-2030. Available from : https://kemkes.go.id/id/rencana-aksi-nasional-ran-eliminasi-kanker-leher-rahim-di-indonesia-tahun-2023-2030.
5. Ozturk NY, Hossain SZ, Mackey M, Adam S, Brennan P. HPV and Cervical Cancer Awareness and Screening Practices among Migrant Women: A Narrative Review. Healthcare (Basel). 2024;12(7):709. Available from : https://www.mdpi.com/2227-9032/12/7/709
6. Australian Institute of Health and Welfare. Available from : https://www.aihw.

gov.au/
7. Cheung T, Lau JTF, Wang JZ, Mo PKH, Ho YS. Acceptability of HPV vaccines and associations with perceptions related to HPV and HPV vaccines among male baccalaureate students in Hong Kong. PLoS One. 2018;13(6):e0198615. Available from : https://pubmed.ncbi.nlm.nih.gov/26838228/
8. Khalil J, Boutros S, Hassoun A, Hallit S, Barakat H. Human papillomavirus vaccine knowledge and conspiracy beliefs among secondary school students in Lebanon. BMC Pediatr. 2023;23(1):363. Available from: https://pubmed.ncbi.nlm.nih.gov/37454098/
9. Ogundipe L, Ojo T, Oluwadare T, Olayemi T, Oluwafemi F, Oni O, et al. Cervical cancer screening and vaccination: knowledge, awareness, and attitude of female staff in a Nigerian University. BMC Womens Health. 2023;23(1):218. Available from : https://pubmed.ncbi.nlm.nih.gov/37138288/
10. Ramesh PS , Krishnamurthy S, Shrestha S, Nataraj SM, Devegowda D. Knowledge, awareness and prevalence of Human papillomavirus among local University students and Healthcare workers in South India: a cross-sectional study. Clin. Epidemiol. Glob. Health. 2021;12: 100839. Available from : (https://www.sciencedirect.com/science/article/pii/S2213398421001470)
11. Waller J, Waite F, Marlow L. Awareness and knowledge about HPV and primary HPV screening among women in Great Britain: An online population-based survey. J Med Screen. 2024; Jun;31(2):91-8. https://pubmed.ncbi.nlm.nih.gov/37875156/
12. Momodu A, Ohenhen J.E, Iyare G.I, Muhibi M.A, Avwioro G, et al. Knowledge and awareness regarding pap test and HPV typing for cervical cancer screening in Edo North, Nigeria. Discov Public Health 2024: 2: 191. Available from : https://link.springer.com/article/10.1186/s12982-024-00319-2
13. Ekawati F.M, Listiani P, Idaiani S, Thobari J.A, Hafidz F. Cervical cancer screening program in Indonesia: is it time for HPV-DNA tests? Results of a qualitative study exploring the stakeholders' perspectives. BMC Women's Health 2024:24:125. Available from: https://pubmed.ncbi.nlm.nih.gov/38365690/
14. Endarti D, Satibi S, Kristina SA, Farida MA, Rahmawanti Y, Andriani T. Knowledge, Perception, and Acceptance of HPV Vaccination and Screening for Cervical Cancer among Women in Yogyakarta Province, Indonesia. Asian Pac J Cancer Prev. 2018 ;27;19(4):1105-11. Available from: https://pubmed.ncbi.nlm.nih.gov/29699371/
15. Pangaribuan SM, Barakah JT. Perception, Knowledge and Attitude About Human Papillomavirus Infection Among Adult Female in Ciranjang, West Java. Dunia Keperawatan. 2020;8(2):120-9.
16. Indarti, J. The Role of Social Obstetrics and Gynecology in the Coverage of Cervical Cancer Screening in the Era of Health Transformation in Indonesia. Indones J.Obstet Gynecol.2023;11(4):198-200.
17. World Bank, 2019, "Aspiring Indonesia-Expanding the Middle Class. Available from : https://documents1.worldbank.org/curated/en/519991580138621024/pdf/Aspiring-Indonesia-Expanding-the-Middle-Class.pdf
18. Ryan M, Marlow L, Waller J. Socio-demographic correlates of cervical cancer risk factor knowledge among screening non-participants in Great Britain. Prev Med. 2019;125:1-4. Available from: https://pubmed.ncbi.nlm.nih.gov/31085204/
19. Olsson SE, Shah H, Haase E, Pagidas K. Perceptions and Barriers to Human Papillomavirus Vaccination and Cervical Cancer Screenings: A Survey Study of Underserved Populations in North Texas. Public Health Challenges, 2024; 3:e70018 Available from: https://onlinelibrary.wiley.com/doi/epdf/10.1002/puh2.70018
20. Wilding S, Wighton S, Halligan D, West R, Conner M, O'Connor DB. What factors are most influential in increasing cervical cancer screening attendance? An online study of UK-based women. Health Psychol Behav Med. 2020 Aug 7;8(1):314-28. Available from: https://pubmed.ncbi.nlm.nih.gov/34040874/
21. Zhang S, Liu YH., Zhang HF., Meng LN., Liu PX. Determinants of undergraduate nursing students' care willingness towards the elderly in China: Attitudes, gratitude and knowledge. Nurse Educ Today. 2016;43:28–33. Available from: https://pubmed.ncbi.nlm.nih.gov/27286941/
22. Umami DA. Relationship of Husband Support and Support of Health Officers to Examination Behavior of IVA in Padang Serai Puskesmas. Journal Of Midwifery.2019: 7(2):9-18.
23. Salam, I., Sudirham, S., Sari, T. B. The

Influence of Husband Support and Information Sources on Cervical Cancer Screening Behavior. Journal of Public Health and Pharmacy.2024; 4(2): 172-81. Available from: https://pdfs.semanticscholar.org/86f6/e65638adab48032c4099c28858dd4a0fe79b.pdf

24. Aimagambetova G, Atageldiyeva K, Marat A, Suleimenova A, Issa T, Raman S, et al. Comparison of diagnostic accuracy and acceptability of self-sampling devices for human Papillomavirus detection: A systematic review. Prev Med Rep. 2024;38:102590.Available from: https://pubmed.ncbi.nlm.nih.gov/38283967/
25. Ji X, Hao M, Wang Y, Kong W, Pan Z, Sun Q, et al. Human papillomavirus self-sampling in Asia: a systematic review. Front Microbiol. 2025:14(16):1540609. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11949917/